S. HRG. 103-312

PLANT VARIETY PROTECTION ACT AMENDMENTS OF 1993

HEARING

BEFORE THE

SUBCOMMITTEE ON
AGRICULTURAL RESEARCH, CONSERVATION,
FORESTRY, AND GENERAL LEGISLATION

OF THE

COMMITTEE ON AGRICULTURE,
NUTRITION, AND FORESTRY
UNITED STATES SENATE

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

ON

S. 1406

A BILL TO AMEND THE PLANT VARIETY PROTECTION ACT TO MAKE SUCH ACT CONSISTENT WITH THE INTERNATIONAL CONVENTION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS OF MARCH 19, 1991, TO WHICH THE UNITED STATES IS A SIGNATORY, AND FOR OTHER PURPOSES

SEPTEMBER 20, 1993

Printed for the use of the
Committee on Agriculture, Nutrition, and Forestry

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PLANT VARIETY PROTECTION ACT AMENDMENTS OF 1993

MONDAY, SEPTEMBER 20, 1993

UNITED STATES SENATE, SUBCOMMITTEE ON AGRICULTURAL RESEARCH, CONSERVATION, FORESTRY, AND GENERAL LEGISLATION, COMMITTEE ON AGRICULTURE, NUTRITION, AND FORESTRY,

Washington, DC.

The committee met, pursuant to notice, at 2:16 p.m., in room SR-332, Russell Senate Office Building, Hon. J. Robert Kerrey presiding.

Present or submitting a statement: Senators Kerrey, Harkin, and Cochran.

STATEMENT OF HON. J. ROBERT KERREY, A U.S. SENATOR FROM NEBRASKA

Senator KERREY [presiding]. The subcommittee will come to order. First of all, this hearing is being held just for the purpose of receiving testimony on S. 1406, the Plant Variety Protection Act Amendments of 1993, which was introduced on August 6 by Senator Daschle and myself.

At the outset, I want to thank Senator Daschle, who is the chairman of this subcommittee, for his cooperation in allowing us to move forward with these hearings.

There are three objectives in this piece of legislation. First, it is intended to ensure that those who risk the technological, financial, and other resources necessary to develop new seed varieties are rewarded for their investment and encouraged to continue this essential research.

Second, the measure is intended to make sure that those who have come to depend on steady germplasm advancements, including farmers, consumers, and others who benefit from plant improvements, continue to enjoy the economic and other rewards provided by scientific progress.

Third, this bill is offered as a necessary step to fulfill the obligations incurred by the United States as a result of our participation in agreements designed to protect intellectual property rights in the international marketplace.

As a matter of fact, I first took an interest in this issue when I learned last year that the executive branch apparently had taken no steps to follow through on a treaty that the United States signed in 1991.

Under current law, Federal protection of the intellectual property rights that arise from plant breeding is available in the United States in three forms: plant patents, plant variety protection, and utility patents. Parental lines of crops normally sold as hybrids, such as corn and sunflowers, are protected as trade secrets under state contract law.

Prior to 1930, plant breeding and research depended on federally funded agricultural experiment stations and the limited endeavors of private plant breeders to develop new varieties. Financial incentives to the private sector were inadequate to recover research and development costs. Indeed, the only opportunity for cost recovery was in the initial sales of the varieties, since purchasers could freely propagate the variety once it was released to the public.

To address this shortcoming and to encourage private investment in plant development, asexually reproduced plants were the first to receive protection with enactment of the Plant Patent Act of 1930. Because of doubts about whether sexually reproduced plants could breed true to type, sexually reproduced varieties continued to be bred primarily at public institutions and released without protection. All profits were determined by the initial sales of the seed.

Two developments subsequently led to the enactment of the Plant Variety Protection Act (PVPA) and its protection for sexually reproduced varieties. First was eventual acceptance of the notion that sexually reproduced varieties would breed true to type. Second was the formation, in 1960 by several European countries, of the International Union for the Protection of New Varieties of Plants (UPOV).

The PVPA was enacted in 1970, first to provide economic incentives for companies to undertake the costs and risks inherent in producing new varieties, and secondly, to alleviate the competitive disadvantage that American agriculture and breeders face because European countries offered protection under UPOV.

In the original effort to protect plant breeders' rights, Congress intended "To encourage the development of novel varieties of sexually reproduced plants and to make them available to the public, providing protection to those who breed, develop, or discover them, and thereby promoting progress in agriculture in the public interest." The success of the PVPA can be judged from the increase in private sector research and development on plant breeding and the success of modern varieties.

For example, increases in crop yields since enactment of PVPA for major commodities range from 7 percent for alfalfa to 35 percent for cotton. According to USDA estimates, approximately 60 percent of the increase can be attributed to improvements in plant breeding. At the end of fiscal year 1992, nearly 3,000 plant variety protection "certificates" were in force and 325 are expected to be issued in 1993.

While similar in its intent of providing incentive and protection to inventors, the PVPA differs from the Patent and Trademark Act in a number of ways: the legal standards for protection are less stringent; administration is through the Department of Agriculture rather than the Department of Commerce Patent and Trademark office; and exemptions allow the use of protected varieties in the development of new varieties and permit individual farmers to

save and sell limited quantities of seed—the so-called "farmer's exemption."

Eligibility for protection under the current PVPA requires that varieties be novel, distinct, uniform, and stable. The "unobvious" requirement of patent law, considered a more difficult hurdle, is supplanted in PVPA by "distinctiveness"—a requirement that the variety be unique in one or more identifiable morphological, physiological, or other characteristics. Therefore, an obvious, but distinct, new variety may be more easily protected under PVPA.

The research exemption was included to promote the free flow of germplasm—essential to the maintenance of genetic diversity. The farmers' exemption was included to allow farmers to continue their traditional practice of saving seed for their own planting needs and selling a limited quantity to their neighbors.

The International Convention for the Protection of New Plant Varieties, which prompted enactment of the PVPA, was revised in 1991 as part of the general strengthening of intellectual property rights in the international arena and in response to advancement in both knowledge and technology. Twenty-one countries, including the United States, are now members of the UPOV, and 16 of those members, including the United States, have signed the revised treaty, although none of those has ratified the new treaty to date. Six other countries have breeder rights similar to the UPOV and are expected eventually to comply with UPOV.

If the United States is going to ratify the revised treaty, S. 1406 represents one way to make the conforming changes in the Plant Variety Protection Act. The major changes include: first, extending protection to first generation hybrids; second, lengthening the term of protection to 20 years; third, extending protection to harvested plant parts; fourth, placing additional limits on the farmers' exemption; fifth, defining essentially derived and thus providing credit to plant breeders whose property is used in newer varieties; and sixth, modifying a number of definitions to conform to UPOV.

In preparing this legislation, I asked the Department of Agriculture to provide technical assistance in drafting the language necessary to bring the PVPA into compliance with the 1991 treaty. The bill in its current form reflects those technical recommendations, nothing more and nothing less. In that respect, this bill should be viewed as a starting point.

With this in mind, the subcommittee looks forward to hearing testimony from representatives of Government, the seed industry, state regulators, farmers, and others concerned about the proposed changes to the PVPA. We invite you to make additional recommendations for what modifications, if any, should be made to this legislation and whether, in fact this particular effort is necessary and should move forward.

I should put all the witnesses on notice that I will be strict about making sure that no one exceeds their alloted time. I will ask the Department to limit its statement to 10 minutes, and I will ask each of the other witnesses to limit their presentation to 5 minutes. Of course, the entire written statement of each witness will be entered into the record.

Finally, I would like to ask each of you to stay in your place once you have finished your statement so that we can pose questions to the group as a whole.

We will begin the hearing with a statement from the Senator from Iowa, Senator Harkin, who obviously has a great interest in this issue. I appreciate your being here.

STATEMENT OF HON. TOM HARKIN, A U.S. SENATOR FROM IOWA

Senator HARKIN. Thank you, Mr. Chairman.

Your opening statement correctly summed up the situation confronting us now. Of course, you do have a bill in that you have sponsored, S. 1406, to make sure that we conform with the UPOV treaty which I believe we must do.

Mr. Chairman, obviously some assurance of reward for the expenditures that are made by companies to invest the time and the effort, the expertise they have in research and development is a very important consideration in whether or not they do that kind of research.

The Plant Variety Protection Act, which you mentioned, basically was designed to encourage the development of new varieties; secondly, to make sure that they were available to the public; and third, to give protection to those who develop these varieties to promote progress in agriculture.

Obviously, if you look back just the last 23 years, we have had some great progress, new varieties, new strains that are higher yielding or more resistant to adverse weather or pests. That is what these new plant varieties have meant for farmers, that they can have greater assurance that if they plant a certain variety in a certain latitude, for example, or a certain altitude, a certain climate, or a certain type of soil, that they are going to get a little bit better yield than what they have in the past.

So the law, as you said, does provide a patentlike protection, and your bill would make this conform with the UPOV treaty.

The most controversial part, obviously, is the prohibition of selling farmer-saved seed. However, I would also point out, Mr. Chairman, that farmers would still have the ability to save seed for their own use. They could still protect themselves by saving the seed for their own use.

So really we have a question here of what is in the real interest of agriculture—of farmers, and of promoting research. On the one hand, farmers might argue that they should be able to buy seed from a neighbor who reproduced it from a protected variety bought from a seed company. But on the other hand, the seed company would say that it must have protection against this kind of reproduction and resale or it would have no incentive to invest the kind of money that is needed to develop new varieties, and it takes a great deal of investment to develop these new varieties and to do the necessary research.

You have witnesses, I know, Mr. Chairman, from Iowa on both sides of this issue, but I must say that from my looking at this issue and having been involved with agriculture all these many years, I view it no differently than any other kind of intellectual

property right. It is like a book. If I buy a book—you haven't written a book yet, have you, Mr. Chairman?

Senator KERREY. No. [Laughter.] I have some notes.

Senator HARKIN. If you write a best-selling book, which you may do one of these days, and I go out and buy it, you have expended all this intellectual effort and time to write this book. What if I buy it, I take it home, and I just start reprinting it and selling it. I don't think anyone really wants to see that happen. We have to encourage intellectual endeavors in research and development.

Senator KERREY. In my case, if you would promise to do that, I might write a book. [Laughter.]

Senator HARKIN. I had better use a different example here.

So that is really the crux of it, and while I do sympathize with the case that has been in the courts, we do have to promote this type of endeavor in research and development. It is a tough issue, because it does cross lines in terms of individual rights, property rights, that type of thing, but I think on the whole, Mr. Chairman, that we have to conform to the UPOV treaty.

I congratulate you for your leadership in this area and for sponsoring the legislation and holding this hearing today. I apologize that I have to leave, but I just wanted to be here to make that opening statement and to encourage you in your endeavors.

Thank you, Mr. Chairman.

Senator KERREY. Thank you, Senator.

There are three people from USDA. Kenneth Clayton is the Acting Administrator of Marketing Programs for the Agricultural Marketing Service. If you would like to lead off and perhaps introduce the next two gentlemen——

Dr. CLAYTON. Sure. I would be very happy to do that.

Senator KERREY. Do it in whatever way you want, Dr. Clayton.

STATEMENT OF KENNETH C. CLAYTON, ACTING ADMINISTRATOR, MARKETING PROGRAM, AGRICULTURAL MARKETING SERVICE, U.S. DEPARTMENT OF AGRICULTURE, WASHINGTON, DC, ACCOMPANIED BY DR. KENNETH EVANS, COMMISSIONER OF PLANT VARIETY PROTECTION OFFICE, USDA; H. DIETER HOINKES, DIRECTOR OF PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE; AND ALEX SIMELFAUB, OFFICE OF GENERAL COUNSEL, USDA

Dr. CLAYTON. Thank you, Senator Kerrey. Good afternoon to you and the subcommittee.

I do very much appreciate your invitation to present the administration's views on S. 1406, a bill to conform the Plant Variety Protection Act to the articles of the 1991 act of the International Convention for the Protection of New Varieties of Plants, also known as the UPOV Convention.

With me today are Dr. Kenneth Evans, who is the Commissioner of our Plant Variety Protection Office, also H. Dieter Hoinkes of the Patent and Trademark Office at the Department of Commerce, and seated behind me is Alex Simelfaub, who is with our Office of General Counsel at USDA.

Mr. Chairman, I will briefly summarize my written testimony and I ask that the full testimony be submitted for the record.

Mr. Chairman, let me state at the outset that the administration does support enactment of S. 1406. In the United States, one effective form of protecting new plant varieties that are reproduced by seed is by means of the Plant Variety Protection Act, otherwise referred to as the PVPA. The PVPA passed the Congress in 1970.

To afford our plant breeders protection in other countries as well, the United States became a member of the UPOV Convention in 1981. After several years of extended negotiations, the convention was significantly revised in 1991 to provide plant breeders with improved protection for innovative plant varieties. Although the United States is a signatory to the 1991 act of the UPOV Convention, the PVPA must be amended to enable the United States to adhere or become party to the 1991 version.

Mr. Chairman, given the limited time available to us today, I would like to briefly address the more important changes to the PVPA that S. 1406 would bring about.

Turning first to the farmers' exemption provisions, S. 1406 would continue to safeguard the privilege of farmers to save seed of a protected variety for planting on their own holdings. The sale of seed by farmers to others would be prohibited under S. 1406.

However, and I must underscore this, the privilege of farmers to sell saved seed protected under present law would not be diminished. Rather, sale of saved seed would be subject to authorization by the breeder only for varieties receiving protection after the date of enactment of S. 1406. This change in the farmers' exemption is necessary in order for the United States to comply with the 1991 convention.

Without encouragement for investment in the development of new varieties, the whole farming community will gradually be put at an economic disadvantage. Fewer plant varieties with improved characteristics would be developed, leaving farmers to plant outmoded varieties which give lower yields and which succumb to new strains of pests and diseases, thus giving farmers in other countries a clear competitive advantage.

Another major change to be made by S. 1406 is the establishment of a category of essentially derived varieties. This change, which would be applicable only to varieties protected under S. 1406 and would not apply retroactively, would enable the owner of an initial variety to exclude the selling or marketing of varieties that differ only slightly from the initial variety. This concept is the most striking innovation in the 1991 revision of the UPOV Convention. It is anticipated that this change will end the practice of altering just slightly the successful varieties of others and escaping infringement charges under present law.

Other changes necessary to bring the PVPA into conformance with the 1991 convention are more limited in scope. For example, the use of date of determination would be replaced by the use of data of filing for protection as the basis for determining eligibility for protection. Eligibility for protection would also be extended to first generation hybrid varieties.

Also, to conform to the 1991 act of the UPOV Convention, provision is made for protected varieties to be sold by variety name only. Breeders would no longer be able to market seed of a protected variety labeled as "variety not stated."

In the infringement area, the list of actions that constitute infringement would be expanded by S. 1406, namely by adding conditioning a protected variety for purposes of propagation. This would not, however, apply to the conditioning of saved seed by farmers for planting on their own holdings. Stocking a variety for any purpose would also constitute infringement.

Infringement would also be extended to include acts involving harvested material, if such material is obtained through unauthorized use of propagating material.

Under S. 1406, the period of protection would be increased from 18 to 20 years for most crops and to 25 years for trees and vines.

Finally, Mr. Chairman, the provisions of S. 1406 would not take effect until 6 months after enactment and would apply only to varieties protected after that 6 months.

In closing, Mr. Chairman, we believe that S. 1406, if enacted into law, would enable the United States to ratify the 1991 act of the UPOV Convention, thereby continuing the United States leadership role as a proponent of effective protection of intellectual property. At the same time, these changes in the PVPA will greatly encourage the development of new varieties of plants to the benefit of our farmers, the seed industry, and the American consumer.

This concludes my statement. My associates and I would be pleased to respond to any questions that you might have.

[The prepared statement of Dr. Clayton follows:]

PREPARED STATEMENT OF KENNETH C. CLAYTON, ACTING ADMINISTRATOR, AGRICULTURAL MARKETING SERVICE, U.S. DEPARTMENT OF AGRICULTURE

Good afternoon, Mr. Chairman and members of the subcommittee. I very much appreciate the invitation to present the administration's views on S. 1406, a bill to conform the Plant Variety Protection Act to the articles of the 1991 act of the International Convention for the Protection of New Varieties of Plants, also known as the UPOV Convention. Accompanying me today are Dr. Kenneth Evans, Commissioner of the Plant Variety Protection Office, and H. Dieter Hoinkes, of the Patent and Trademark Office, Department of Commerce.

The administration supports the enactment of S. 1406 and the effective protection of all forms of intellectual property. This includes new plant varieties, which are a form of invention. In the United States, one effective form of protection for new plant varieties that are reproduced by seed is the Plant Variety Protection Act (PVPA). To afford our plant breeders protection in other countries as well, the United States became a member of the International Union for the Protection of New Varieties of Plants (UPOV). That union was established by the UPOV Convention in 1961. In 1978, the UPOV Convention was revised and in 1981 the United States became a party to that act by executive agreement. UPOV presently has 24 member countries, including most of our important trading partners. The convention was again significantly revised in 1991 to provide plant breeders with improved protection for innovative plant varieties. Representatives of the Departments of Agriculture, Commerce and State participated in the negotiations that resulted in the 1991 act of the UPOV Convention. Although the United States is a signatory to that act, the PVPA must be amended to enable the United States to adhere or become party to the 1991 version.

Development of new plant varieties is important for reasons beyond increasing the production of food and fiber. The ever-changing picture of plant pests and diseases is a frightening one. New pests, like the Russian wheat aphid, are sometimes introduced into this country despite our best efforts at quarantine. New strains of fungus, like the newest forms of barley stem rust and leaf rust, evolve and threaten cereal production. The most environmentally sound method of coping with these threats is to develop new resistant varieties of crop plants.

Increasing pressure on the environment also necessitates the development of new plant varieties which are more efficient consumers of resources and producers of food and fiber. Drought-tolerant varieties of buffalograss, for example, may hold out

promise of turf that needs less watering than more conventional grass. Increased production per acre remains a goal of the plant breeder in these days when more and more agricultural land is being converted from agriculture to housing and industry.

The development of new plant varieties is arduous, time consuming, and costly. Many years must be spent in the development of a single new variety, with no guarantee of its success or profit. By granting to the owner of a variety the right to prevent unauthorized sale of seed of that variety, the PVPA provides the owner with the opportunity to recover the costs of development. This encourages investment in new varieties that respond to the changing needs of American agriculture.

The UPOV Convention provides for uniform practice in construction and administration of plant variety protection laws in the various member states. If the United States is to ratify the 1991 act of the UPOV Convention, the Plant Variety Protection Act will need to be amended to conform to its provisions.

Should the amendments be adopted, they will serve American agriculture and the American consumer in several ways:

1. They will encourage the development of new varieties for American growers by strengthening the rights of those who develop the varieties in order to ensure an adequate return on their investment.
2. They will encourage other countries to follow suit, thereby increasing markets abroad for the products of American agriculture by assuring that American originators of new varieties could apply for effective protection available in other convention countries.
3. They will increase access by American growers to high quality varieties of seeds developed outside the United States that might not otherwise be available in this country. Foreign breeders will have the confidence that adequate and effective protection is available to them in the United States. As a consequence, American consumers will benefit from a wider and more secure food and fiber supply and American plant breeders will be able to use these varieties in their own breeding programs.

Mr. Chairman, we commend you and the subcommittee for holding this hearing. We hope that with the collective efforts and wisdom of the Congress, the executive branch, consumers, the seed trade industry, the agricultural production sector, public interest groups, and plant breeders, we may be able to improve our PVPA, thus permitting the United States to become party to the 1991 act of the UPOV Convention and thereby better serve American agriculture and the American consumer. The administration supports amendments which make the following changes in the PVPA.

The American tradition of encouraging farming by private individuals goes back to the founding of our Nation. Under S. 1406, a provision is included which would continue to safeguard the privilege of farmers to save seed of a protected variety for planting on their own holdings. The sale of seed by farmers to others would be prohibited under S. 1406. However, the privilege of farmers to sell saved seed protected under present law would not be diminished. Rather, sale of saved seed would be subject to authorization by the breeder only for varieties receiving protection after the date of enactment of S. 1406. This change in the farmers' exemption is necessary to comply with the 1991 Convention.

I want to make it clear that this administration wants to continue helping farmers. However, beyond the original purchase price of the seed, no payment is now made to the companies that developed the varieties by those selling saved seed. While this practice has been possible under the current PVPA, it is not compatible with the 1991 act of the UPOV Convention.

Prohibiting sales of saved seed for replanting is not, however, simply a matter of protecting seed companies. Without encouragement for investment in the development of new varieties, the whole farming community will gradually be put at a disadvantage. Fewer plant varieties with improved characteristics will be developed, leaving farmers to plant outmoded varieties which give lower yields and which succumb to new strains of pests and diseases. Farmers in other countries where investment in new varieties has continued will enjoy a clear competitive advantage.

Another major change to be made by these amendments is the establishment of a category of "essentially derived varieties." This change, which would be applicable only to varieties protected under S. 1406 and would not apply retroactively, would enable the owner of an "initial" variety to exclude the selling or marketing of varieties that differ only slightly from the initial variety. This concept is the most striking innovation in the 1991 revision of the UPOV Convention. It is anticipated that this change will end the practice of altering just slightly the successful varieties of

others, and escaping infringement charges under present law while benefiting from the desirable characteristics of the initial variety. This concept redistributes the right to profit among the owners of varieties, recognizing those who discovered and developed the variety in the first place. It does not extend the rights of owners to the detriment of farmers and others.

Other changes necessary to bring the PVPA into conformance with the 1991 Convention are more limited in scope and I will now discuss them briefly.

The use of date of determination would be replaced by the use of date of filing for protection as the basis for determining eligibility for protection. The method of deciding when the filing in another country makes a variety a matter of common knowledge would be established. As the filing date will be a matter of record, the provisions in the current statute for adversarial proceedings relating to date of determination are superfluous and will be removed by these amendments. A provision would be made for determining eligibility for protection when applicants have the same filing date for varieties which cannot be clearly distinguished.

Eligibility for protection would also be extended to first generation hybrid varieties. This change would provide a certain amount of additional protection for the breeder.

Provision is made for protected varieties to be sold by variety name only, for as long as they exist, even after the term of protection has expired. Breeders would no longer be able to market seed of a protected variety labeled as "variety not stated." S. 1406 also provides for the cancellation of protection if owners do not cooperate in providing an acceptable variety name.

The list of actions which constitute infringement would be expanded by S. 1406, namely, by adding conditioning a protected variety for purposes of propagation, and stocking a variety for any of the purposes which would constitute infringement. These changes would enable owners to take action at a much earlier stage, thereby minimizing the risk of damage to their interests. The provision against conditioning of a variety for planting would not apply to the conditioning of saved seed by farmers for planting on their own holdings.

Infringement would also be extended to include acts involving harvested material if such material is obtained through unauthorized use of propagating material (seeds).

Also, a number of terms and rules of construction would be changed or added, so that the PVPA would utilize the same terms and concepts as used throughout the member states which are party to the convention.

Under S. 1406, the period of protection would be increased from 18 to 20 years for most crops, and to 25 years for trees and vines. All countries ratifying the 1991 convention would grant protection for these same periods.

Finally, Mr. Chairman, the provisions of the amendments would not take effect until 6 months after enactment. Moreover, the provisions of S. 1406 would apply only to varieties protected after that 6 months.

CONCLUSION

Mr. Chairman, we believe that S. 1406, if enacted into law, would enable the United States to ratify the 1991 act of the UPOV Convention, and thereby continue to play its leadership role as a proponent of effective protection of intellectual property. At the same time, these changes in the PVPA will greatly encourage the development of new varieties of plants, to the benefit of our farmers, the seed industry, and the American consumer.

We realize that there may be other ways to manage the transition from the present statute. We also recognize the need for improvements in the PVPA which are not related to achieving consistency with the 1991 UPOV Convention. While the purpose of my testimony today is to indicate our support for S. 1406, we are open to other beneficial modifications to the PVPA, provided those modifications are consistent with the 1991 act of the UPOV Convention.

This concludes my statement. My associates and I will be pleased to respond to any questions the committee may have.

Senator KERREY. Am I correct, Dr. Clayton, that you have essentially offered testimony for all three?

Dr. CLAYTON. That is correct.

Senator KERREY. I think what I will do is call the next four witnesses who are here from seed companies, and if you don't mind

staying up here, perhaps we can get a small conversation going as well as some answering of questions.

We have Mr. Dietrich Schmidt, who is the president of American Seed Trade Association, Don Latham, who is a farmer and seed producer with the Latham Seed Company in Alexander, Iowa. Please come on up. There is room up here for you.

We have Dr. Vance Watson, who is executive vice president of the Association of Official Seed Certifying Agencies at Mississippi State University, Starkville, Mississippi, and Mr. David Svik, President of the Association of American Seed Control Officials at the Nebraska Department of Agriculture in Lincoln, Nebraska.

Dr. CLAYTON. Mr. Chairman, if I might, just to make sure the record is clear, you asked if I was speaking for all three of us. In fact, I am speaking for the administration.

Senator KERREY. Thank you, Dr. Clayton. Your entire statement will be made a part of the record.

Mr. Schmidt, could you begin with your statement, please?

STATEMENT OF DIETRICH SCHMIDT, PRESIDENT, AMERICAN SEED TRADE ASSOCIATION, WASHINGTON, DC; ACCOMPANIED BY ROB ROBINSON, EXECUTIVE VICE PRESIDENT, J.C. ROBINSON SEED COMPANY, WATERLOO, NE, AND CHAIRMAN, INTELLECTUAL PROPERTY RIGHTS COMMITTEE, AMERICAN SEED TRADE ASSOCIATION

Mr. SCHMIDT. Thank you very much, Mr. Chairman.

Good afternoon. My name is Dietrich Schmidt from Saticoy, California. I am the President of Petoseed Company and I am also President of the American Seed Trade Association.

I am here in support of S. 1406, a bill to amend the Plant Variety Protection Act of 1970. I have also filed more detailed testimony with your office.

ASTA, the American Seed Trade Association, is a leading national trade association representing over 500 seed companies, large, medium, small, with and without breeding programs, also, the State Crop Improvement Associations, the State and regional seed organizations, and supportive service industries.

Joining the 1991 UPOV Convention is in the best interest for U.S. agriculture. Most importantly, the reciprocal plant breeders' rights that are granted with adoption of the 1991 UPOV Convention assures U.S. developers and users of protected varieties of clearly defined and internationally accepted standards.

Protecting breeders' rights is good policy for the United States. Farmers and seedsmen benefit equally. New varieties are the cornerstone for keeping U.S. farmers competitive in international commodity markets. Continued competitiveness of American agriculture hinges on protection and incentives for breeders.

The United States would maintain an important leadership position by adopting and complying with the 1991 UPOV Convention. Most major farm groups and the American Seed Trade Association have endorsed the practice of saving seed for planting on a farmer's own holdings.

The United States is a member, as we heard, of the 1978 UPOV Convention and a signatory of the 1991 UPOV Convention, which

still needs Senate ratification. World events and a recognition of the value of protecting intellectual property rights is reflected in the 1991 UPOV Convention, including the concept of essential derivation.

The 1991 UPOV Convention gives breeders increased protection for their products and gives the necessary incentive to stimulate improvements. It will provide U.S. farmers with new varieties needed to maintain a well-recognized world competitiveness in agricultural markets.

The scope of the breeders rights outlines the rights and privileges for the breeder and the end user, the farmer. The research exemption is maintained in the 1991 Convention, and it is important to agriculture as it provides continued opportunity for free exchange of germplasm on a worldwide basis.

The 1991 UPOV Convention introduces the concept of essential derivation. ASTA has adopted guidelines which have been worked out and accepted in the international community. ASTA continues to work together with broad representation from the private and public breeding community to provide additional guidelines.

The concept of essential derivation, however, is one best discussed by the plant breeding community who depends on appropriate protection. In fact, I would almost call this an internal issue.

During the negotiations for the 1991 UPOV Convention, the U.S. delegation strongly defended the practice of the farmer to save seed for planting on his own holdings. ASTA supports that practice for a farmer to save seed for planting on his own holdings. ASTA and its members also fully agree with the 1991 UPOV Convention that sales of saved seed must be dependent only on permission by the breeder of the protected variety.

Farmers are assured that new varieties will continue to be available to them due to S. 1406, and seedsmen benefit from the assurance that protection is complete and unconditional.

The U.S. commitment to protecting intellectual property rights for plants demonstrates to the world community that we are serious. The United States has already taken a very strong position in favor of intellectual property rights protection during the ongoing GATT negotiations.

Mr. Chairman, we have reservations with regard to Section 12. The more uniform transition, as prepared by ASTA and submitted with our written testimony,[1] would aid the educational process and minimize unintentional infringement of the law. For farmers who plant the seed, the conditional provision causes confusion and contradiction.

The new act does not allow the sale of farm-saved seed unless permission is granted by the owner of the protected variety. The seed industry has difficulties with the reason behind the extent of the legislation that advocates a two-tier system of protection. As an association, we question the ability, the wisdom, and the consequences of effectively advocating two laws, specifically with regard to the new concept of essential derivation.

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[1] See "Additional Item," page 17.

As I mentioned earlier, this is mainly a question for resolution within the plant breeding community, and the plant breeding community has worked out a proposed solution which, as I said, is attached to my formal presentation.[2] The substitute language from this group outlines prospective corrective statements that would address this situation. I would respectfully request that this subcommittee and the full committee review this language and consider its merits.

May I now, Mr. Chairman, allow Mr. Rob Robinson, who is executive vice president of the Robinson Seed Company in Waterloo, Nebraska, and also chairman of the Intellectual Property Rights Committee of our American Seed Trade Association, to come to the front and explain on this chart what we mean by transition.

Senator KERREY. Certainly.

Mr. SCHMIDT. Thank you.

Senator KERREY. Your entire statement will be made a part of the record.

Mr. SCHMIDT. That is right.

Senator KERREY. Mr. Robinson.

Mr. ROBINSON. Thank you, Mr. Chairman.

This chart illustrates how ASTA's proposed transitional provision would influence the introduction of an essential derivation. Just to describe it briefly, if you look at the vertical axis, that represents the implementation of the UPOV Convention, here we are illustrating 1994. We have a time line on the bottom, and we have three examples as to how this will influence the introduction of an essential derivation.

In each example, T represents the original or initial variety and when its protection starts. P-prime represents the centrally derived variety developed from P and the time at which application is made for protection or in which first acts of commercialization occur.

In example number one, the initial variety, protected variety, is introduced before the implementation of the UPOV Convention or the effective date of the act. Also, the essentially derived variety, P-prime, is introduced before the effective date. In this case, ASTA's language would say that there should be no dependence between the essentially derived variety and the initial variety.

In the second case, the protected variety is protected, again, before the effective date of the act. The essentially derived variety is introduced after the effective date of the act. In this case, we would say that the essentially derived variety should be dependent on the initial protected variety at the effective date of the act and after, not before.

In the third case, naturally this would represent what you see in terms of the language currently proposed, where the protected variety is introduced to the market or protected before or right at the effective date of the act and the essentially derived variety comes thereafter, and, of course, the essentially derived variety is dependent on the protected variety.

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[2] See ASSINSEL statement, page 18.

Senator KERREY. So essentially the 20-year clock would start in the first case when the derivation occurred, in the second case when the initial variety was introduced, and in the third case when the initial variety is introduced?

Mr. ROBINSON. We are talking about dependency, the essentially derived variety upon the initial variety, which is a consequence of essential derivation. Otherwise, in the case of dependency, in this case the owner of the essentially derived variety must get permission from the owner of the initial variety.

But in this case, even though this protected variety was introduced before the legislation, our proposal is to elevate its protection in regards to essential derivation so that it can have dependency over this essentially derived variety after the effective date of the act.

The transitional provisions as proposed by USDA would greatly delay the effectiveness of the new right of essential derivation. A good variety will last 10 or more years. It seems only right that the varieties protected before the effective date of the act, whose protection is still in effect, should receive the additional protection.

[The prepared statement of Mr. Schmidt, with attachments, follows:]

PREPARED STATEMENT OF DIETRICH SCHMIDT, PRESIDENT, AMERICAN SEED TRADE ASSOCIATION

Good afternoon Mr. Chairman. My name is Dietrich Schmidt president of Petoseed Company in Saticoy, California, and president of the American Seed Trade Association (ASTA). On behalf of the entire membership of the ASTA, I am pleased to be here today to lend support and reaffirm our endorsement of S. 1406, a bill to amend the Plant Variety Protection Act of 1970.

Before I begin, however, I would like to take a moment to thank you and the members of the subcommittee for your leadership and insight into this important area that challenges all of us committed to keeping American farmers on top. Many hours of discussions, research, and planning have gone into this legislation and our membership appreciates your enthusiasm and willingness to bring this issue forward for a thoughtful discussion and, hopefully, a quick resolution.

As the leading national trade association charged with the responsibility and privilege of representing over 500 large, medium, and small seed companies, both with and without research programs, State and regional seed organizations, and supportive service industries, the ASTA is firmly behind the intent and spirit of S. 1406. We do, however, believe that further discussion on the transitional section is in order. Collectively and without hesitation, we wholeheartedly believe that it is in the best interest of American agriculture and U.S. policy to join the 1991 UPOV Convention. In doing so, the United States positions itself as a full partner in recognizing intellectual property rights for developers of seed cultivars. Most importantly, however, the reciprocal plant breeders' rights that are afforded with adoption of the 1991 UPOV Convention, assures developers and users of protected varieties of clearly defined and internationally accepted standards.

Joining the UPOV Convention Strengthens American Agriculture

The supporters of S. 1406 recognize the importance of validating strong intellectual property rights protection. Indeed, the 1991 UPOV Convention outlines standards for protecting plant breeders' rights, while at the same time, helping to arm developers of new varieties with the protection and incentive necessary to bring new and improved products to the markets. These new and improved varieties are developed with the sole intent of providing the necessary tools American farmers need to remain dominant in agricultural markets—high performing seed.

American plant breeders fully understand their responsibility to the farmer. Providing enhanced seeds that incorporate characteristics of drought resistance and pest resistance help the farmer to be a responsible steward, while achieving higher yields and performance.

In becoming a full partner in the 1991 UPOV Convention, the United States prepares itself to continue building on a recognized and sustained superiority in agriculture. Most importantly though, it assures reciprocal plant breeders' rights with other competitors and foreign developers. In turn, farmers continue their right and privilege to save seed for use on their holdings. This practice is fully endorsed by the ASTA, and is one that every major farm and commodity group has highlighted in resolutions and supportive policy statements.

Joining the world's agricultural leaders and our competitors, full acceptance of the 1991 UPOV Convention demonstrates the United States' commitment to protecting intellectual property rights here and abroad. This is especially important for American seed companies that have breeding programs overseas. Reciprocal plant breeders' rights assure continued introduction and development of new cultivars.

1991 UPOV Convention Provisions

As you know, the United States is a member of the 1978 UPOV Convention. You have heard a historical perspective from the U.S. Department of Agriculture. They have effectively outlined the provisions of the new 1991 UPOV Convention and the rationale behind the changes. So, Mr. Chairman, I will not revisit that subject. I do, however, want to take a little time to explain ASTA' s position and policy on these new provisions.

Mr. Chairman, a number of changes are found in the 1991 UPOV Convention, some of which are administrative in nature and others are departures from the 1978 Convention, but have little or no impact on the U.S system of intellectual property rights. It is important to note that these provisions pertain only to protected varieties.

The following are the main modifications in the new convention:

Extension of the Scope of Breeders' Rights

The following acts, with some limitations, now require the permission of the breeder. They include: production or reproduction; conditioning for the purpose of propagation; offering for sale; selling or other marketing; exporting; importing; and stocking for any of the purposes.

Subject to certain limitation, authorization from the breeder must be obtained in respect of harvested material obtained through the unauthorized use of propagating material of the protected variety. Contracting parties may also provide that the breeder's authorization be obtained in respect to products directly obtained from the harvested material.

Again, the impact, Mr. Chairman, would include several noteworthy and significant exceptions. These exceptions include: acts done privately and for noncommercial purposes; acts done for experimental purposes; and acts done for the purpose of breeding other varieties.

A breeder's right can also be restricted in relation to any variety in order to permit farmers to use for propagating purposes, on their own holdings, the product of the harvest which they obtained by planting, on their own holdings. Most simply, Mr. Chairman, the spirit of research is maintained and the ability of farmers to save seed for use on their own holdings is clearly outlined.

Introduction of the Principle of Dependence

The principle of dependence flows from the term "essentially derived varieties." This term has been defined by the UPOV Convention and is the subject of further study to establish clear guidelines. Guidelines are being worked on both nationally and internationally at this time, Mr. Chairman. At present, the ASTA has defined the term as follows:

> Varieties which are essentially derived but nonetheless clearly distinguishable from existing protected varieties qualify for legal protection but should only be commercialized with the consent of the owner of the original variety.
>
> A new variety should be considered to be essentially derived from a protected variety if, in view of its characteristics and method of development, it would be considered by a plant breeder of ordinary skill in the species to have incorporated in the new variety essentially the genotype of the protected variety. Factors to be considered in evaluating the method of development should include the sources of germplasm used, and the breeding methods employed, including the reasonably expected results of those methods.

Currently, Mr. Chairman, the 1970 PVP Act qualifies a variety for protection if it varies in one or more characteristics from an existing variety. This allows a proliferation of new protected varieties which differ from an existing variety by only small differences such as flower color. These varieties offer nothing extra to a producer and result in companies riding into the market on the coattails of their competitors. In doing so, one company capitalizes on the research conducted by another company by plagiarizing that company's varieties.

The principle of dependence would not change the criteria for what qualifies a variety for protection, but if the genetic differences did not meet certain standards, it *could not* be commercialized without permission of the owner of the variety from which it was derived.

Mr. Chairman, I'd like to offer one final point on the concept of essentially derived. Many outside of the seed industry are concerned over this new and technical term. Members of the seed industry, and especially the ASTA membership, recognize that this is an *internal* issue. The issue of dependency *does not* affect the farmer. And, while there are ongoing discussions and debate on defining parameters for essentially derived varieties, American farmers can rest assured that the industry's commitment to providing new and improved varieties is unyielding and *is* and *will* remain apart from the issue of essentially derived.

Recognition of the Existence of Farm-Saved Seed

Although the current PVP Act contains a saved-seed provision, the existing UPOV Conventions have no such provision. The new convention simply states that a contracting party, within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder, restrict the breeder's right in relation to any variety in order to permit farmers to use for propagating purposes, on their own holdings, the product of the harvest for which they have obtained by planting, on their own holdings, the protected variety or an essentially derived variety. "Holdings" are considered to be land owned, rented, or leased by a farmer.

It should be noted, Mr. Chairman, that the farm-saved seed provision in the new convention *does not* permit the selling of farm-saved seed. In order to be in full compliance with the convention, S. 1406 contains a provision that stipulates that sales of protected varieties of seed are *dependent* on permission granted by the owner of the protected variety.

Mr. Chairman, it has become increasingly apparent that of all the issues before this subcommittee, the most widely discussed component of S. 1406 has centered on this provision. The sale of farm-saved seed has led to the abandonment of research programs on certain crops by seed companies because of an inability to compete with their own varieties. Time considerations preclude me from going into graphic detail of the casualties resulting from farm-saved sales. Seed companies large and small alike have restructured, curtailed, and in the most drastic of examples, abandoned major research programs. All of these actions illustrate a painful, but necessary recognition by seed companies of an inability to compete with farmers capitalizing on substantial financial, human, and research commitments.

A surprising few believe that a variety granted a PVP certificate is just that—a PVP certificate. The seed industry, however, Mr. Chairman, views the PVP certificate as a "patentlike" license that ensures protection and a recognition of development worthy of expected rights and privilege. The ASTA fully supports the tradition and spirit of the crop exemption. We do not, however, believe that breeders, whether public or private, individual or university, have to *expect* or *accept* anything less than full protection. The UPOV Convention permits sales contingent on the permission of the owner of the protected variety. This standard is in keeping with the intent of the PVP certificate and is, most importantly, fair and consistent to those who assume the risk and investment.

While S. 1406 will provide this much needed protection to the developer, the benefit extends to the farmer. Farmers need to know that the industry that provides them with the single most important component in agriculture is firmly committed to bringing to the market a steady stream of improved and enhanced seed. Without newer and improved varieties, American farmers cannot compete with our competitors overseas. If our competitors recognize the value and necessity of protecting breeders' rights and we, in turn, fail to do so, our ability to continue dominating agricultural markets will be in serious jeopardy. S. 1406 seeks to better position American agriculture by giving those who *develop* the seed protection and those who *utilize* the seed the selection they have come to know and expect.

Mr. Chairman, these changes as reflected in S. 1406 are necessary for the continued health and stability of American agriculture. Acceptance and adherence to the 1991 UPOV Convention is in the best interest of all of us who are committed to the

farmer and to the *breeder.* Some opponents of S. 1406 maintain that American agriculture is not affected by incidental sales or those who sell protected varieties by any definition or circumstance. To them, it is an issue that measures a "perceived" ability to sustain potential lost sales of protected varieties.

Like any business or area of intellectual property, protection and incentive go hand in hand. Risk of capital and market share is real. An inability to protect runs contrary to the spirit of the UPOV Convention and our ability as an industry to foster a partnership with the farmer. Seed companies must know that their investment of time, research, and capital is truly protected, *without* exception.

Section 12—Transitional Provisions

That is why, Mr. Chairman, I must take the time to articulate the ASTA's grave concern over Section 12 as currently written. Section 12, as you will recall, stipulates the transition period and the criteria necessary for implementation.

ASTA is concerned with the provisions outlined in Section 12. ASTA members are confused that there would essentially be two laws. It is our understanding that anyone possessing a PVP certificate prior to the enactment of the amendments would be covered under the 1970 PVP Act. Those individuals, companies, or universities granted certificates after enactment would enjoy the rights and privileges of the new act.

From the standpoint of the plant breeder, the message is clear: you get protection for a new variety, but not an old. For the farmer, the message is equally clear: operate under the 1970 act for old varieties and then later the rules change and you can't sell unless you gain permission of the owner of the protected variety. At best, this is confusing and contradictory. A different label highlighting the issue date of a PVP certificate will not adequately protect farmers or the seedsmen. Confusion and uncertainty will not be an adequate defense for seedsmen or farmers.

Changing a tradition and rewriting a law is never easy. In fact, it shouldn't be. As an association, we question the ability, the wisdom, and the consequences of effectively advocating two laws. Not only is this *not* in keeping with the spirit and intent of the changes, it *compromises* the ability and *penalizes* members of the plant breeding community who have developed popular and proven varieties that bear a PVP issue certificate date prior to enactment of the new law. Moreover, farmers are sure to be confused on what they can and cannot do. Because there are no mechanisms in place to monitor and patrol seed sales, farmers and both public and private plant breeders alike will be in an unenviable position of living with two laws and standards for an unacceptable period.

When the ASTA began working on educating and informing everyone affected by the 1991 UPOV Convention, we were heartened by the willingness and enthusiasm to learn more and to better position American agriculture. After all, everyone agrees that the key to our economic success hinges on agriculture. What we did not find, however, was an ability to discuss openly and honestly the ramifications of change.

Mr. Chairman, the ASTA was concerned to see Section 12 in its present form. While we remain most anxious to participate in the process, we must express our frustration at this attempt to incorporate two sets of standards for recognizing and rewarding incentive and ingenuity. Not only does Section 12 adversely affect the industry committed to supporting the farmer, it offers *no real benefit* for the farmer who continues to expect new and improved varieties. This *double standard* penalizes the legitimate farmer who depends on the best germplasm and makes his first decision each planting season by selecting proven seed. Additional labeling will not counter the confusion and double standard for the producer or the seedsman.

Yield and performance have always been the criteria a farmer uses in seed selection. Farmers know that many things go into that seed bag. Within that bag is considerable research, marketing, development, and an expectation for performance. Is it really the intention of this subcommittee to endorse a provision that bases protection on a PVP certificate issue date?

Section 12 further erodes and *compromises* the ability of plant breeders to protect their varieties *far beyond* the issue of the crop exemption. The issue of essentially derived varieties and protecting new varieties internally is *clearly* at risk. In its present form, Section 12 effectively serves to penalize those companies that are in the *development process.* Simply "allowing" a company or individual to withdraw an application for PVP protection *does not* address the situation. ASTA believes that in its current form Section 12 compromises the ability of American seedsmen and all plant breeders to effectively protect their incentives and seeks to *limit* the spirit of development and promise of research.

Plant breeders are developing for the future. And, as they seek protection, the concept of essentially derived will continue to challenge the entire industry. Section 12 *does not*, in the opinion of the ASTA, maintain or promote a fair playing field for breeders. Breeders and farmers alike cannot afford to wait for companies to withdraw applications and then resubmit them because they are eligible for real protection. Further complicating the issue are *backlogs* at the PVP office and research already in progress. Is it fair to assume that plant breeders will put their research on hold because they can't be effectively protected from *crop exemptions* and the *internal issue of essentially derived?* Is it realistic for this subcommittee to believe that companies will simply maintain current research strategies and be unaffected by this current proposal? Can American agriculture afford to put the seed industry in this dangerous position?

I urge this subcommittee to rethink and continue the debate on this provision. To do anything less serves to weaken the intent and spirit of the legislation. I have attached to my formal statement a copy of language that the ASTA has drafted. The substitute language outlines, from our perspective, corrective statements that would address this situation. I would respectfully request that this subcommittee and the full committee review this language and consider its merits. [Ed. Note: See page 22.]

Section 12 adversely affects the seed industry and the entire plant breeding community. The ASTA believes that our experience and potential exposure *demands* our participation and comment. As our ability to compete and effectively serve America's farmers is in serious question, it seems reasonable and necessary for our perspective to be heard. I *urge* this subcommittee to continue discussions on Section 12.

In addition, Mr. Chairman, the ASTA has one other discussion topic that we would like to advance as a way of strengthening the PVP amendments. It is provided in the spirit of identifying a number of what we consider a "minor" modification that would streamline the PVP office and its ability to issue PVP certificates in a timely manner that benefits the farmers and the seed industry. [Ed. Note: See "Additional Item," below.]

As further clarification, I am also including an ASSINSEL document that outlines the principle of essentially derived. The proposal gives further clarification on this important concept and should be useful in further deliberations. [Ed. Note: See page 23.]

Thank you Mr. Chairman and members of the subcommittee for this opportunity to express the concerns, support, and enthusiasm for this legislation. To be sure, the dialogue will continue and the ASTA is *most* appreciative of this hearing. Mr. Chairman, you have our pledge that ASTA remains supportive of this legislation, with the exception of Section 12 in its current form.

I would be pleased to answer any questions you might have and if you desire specific information or clarification, I have a number of technical experts with me that can offer further guidance or explanation.

ADDITIONAL ITEM TO CONSIDER INCLUDING IN S. 1406

Section 62. Insert the language from the Patent Act as recommended by the Secretary of Agriculture's Plant Variety Protection Advisory Board.

Section 62(b) be deleted and replaced by:

> (b) Upon failure of the applicant to prosecute the application within 6 months after any action therein, of which notice has been given or mailed to the applicant or within shorter time, not less than thirty days, as fixed by the Commissioner in the such action, the application shall be regarded as abandoned by the parties thereto unless it be shown to the satisfaction of the Commissioner that such delay was unavoidable.

The Plant Variety Protection Advisory Board considered and recommended this change to improve the efficiency of the Office. Presently, the PVP Office allows 6 months for nearly all responses. This includes requesting clarification of descriptions considered to conflict within exhibits. For example, the flower could be described as purple in exhibit B and exhibit D and as white in exhibit C. For such requests, 30 days would appear to be sufficient with the possibility of requesting an extension of time where the question is more complicated than the PVPO interpreted.

June 5, 1992

ASSINSEL STATEMENT REGARDING THE IMPLEMENTATION OF THE NEW PRINCIPLE OF ESSENTIALLY DERIVED VARIETIES IN THE UPOV CONVENTION

At the UPOV Diplomatic Conference in Geneva in March 1991, new conditions in relation to essentially derived varieties (e.d.v.) were introduced into a revised convention. The following resolution was adopted:

> "The Diplomatic Conference for the Revision of the International Convention for the Protection of New Varieties of Plants held from March 4 to March 19, 1991, requests the Secretary General of UPOV to set in motion immediately after the closing of the Conference the establishment of draft standard guidelines, for adoption by the Council of UPOV, on essentially derived varieties."

In response ASSINSEL presents the following statement.

After careful consideration of the new text Article 14(5) it is concluded that the implementation of this new concept should take the following points into consideration.

Introduction

In all previous statements ASSINSEL has strongly approved the introduction of the essentially derived varieties (e.d.v.) concept. With respect to the very recent developments in the field of plant breeding and biotechnology and the resulting lack of clarity between the fields respectively covered by patents and plant breeders' rights and the degree of protection which they offer, ASSINSEL considers that the new principle builds a bridge between the two protection systems in the interest of the affected industries. This new principle will also decrease drastically the possibility of plagiarism in plant breeding.

ASSINSEL plant breeders are convinced that this new principle brings about an important strengthening of plant breeders' rights without any real restrictions of the key issue of the so-called breeders' exemption.

It has to be appreciated that the introduction of this new principle into the UPOV Convention represents a step into new territories. As usual with such situations there are uncertainties and doubts. Therefore, at this stage, the national legislators - as well as the UPOV Council - should restrict their statements to general formulation of this new principle and should not go too far into detailed regulations. A too detailed regulation would run the risk that omissions will subsequently become apparent or that future developments will be hampered or not provided for. Furthermore the implementation should be practical and not too complicated.

As will be shown in the following, this principle mainly involves questions of scope of protection and enforcement of the rights of the breeder. It is, therefore, left to the initiative of the breeder to enforce these rights.

A. General Aspects

1. In its principle, the concept of e.d.v. deals with the genotype rather than with the phenotype. Contrary to the principle of "clear distinctness" of Article 7 of the UPOV Convention being judged on the basis of the expression of certain morphological or physiological characteristics, Article 14(5) has to do with the question whether the essence of the genotype of the initial variety (i.v.) has been taken over - that means whether it retains virtually the totality of the genome of the i.v. - retaining the expression of the essential characteristics. In this respect, "...essential characteristics that result from the genotype..." include only inheritable characteristics. Furthermore, depending on the given genetic constitution of a given plant species and established breeding technology the required threshold of the quantity of conformity can be different for different species.

2. The "genetic distance/conformity" should be judged on a species-by-species or even within-a-species basis. The methods of derivation may be used as a tool to help to establish or to define an e.d.v.

   The given list of examples for methods of derivation [selection of a natural or induced mutant or of a somaclonal variant, selection of variant individual from plants of the i.v., multiple backcrossing, transformation by genetic engineering: see Article 14(5)(c)] is not an exhaustive list.

3. Whether or not a plant variety is an e.d.v. may need to be based upon scientifically reliable methods. This may start with the judgement of essential characteristics and be completed by methods of genome identification in so far as adequate methods are available. Depending on the given species, this assessment can vary in relation to different methods of derivation used and also by different genetic distances. Scientific and reliable methods for the proof of genetic distances might be e.g. RFLP (Restricted Fragment Length Polymorphism), RAPD (Random Amplification of Polymorphic DNA), PCR (Polymerase Chain Reaction), combining ability.

4. This assessment should be made by species specific experts skilled in the art, including breeders, molecular geneticists, etc.

5. The plant variety offices have only a duty to prove whether a plant variety having been entered for protection fulfills the requirements for protection (DUS-test), regardless of the question of whether it is an e.d.v. or not. Thus for ASSINSEL it is important and obvious that the determination of the existence of an e.d.v. should not be a part of the procedure for granting plant breeders' rights. However, registration data of the variety based on UPOV guidelines should be available after granting of rights.

6. The determination as to whether a plant variety is an e.d.v., is mainly a question of whether it has been derived from a given variety (see 2). Where a plant variety has been developed without using that variety there cannot be essential derivation. However, the general rules of burden of proof have to be considered (see C. below).

7. Essential derivation is a matter of fact whereas dependency resulting herefrom is a possible legal consequence. Therefore, if an e.d.v. has been claimed and proved as such with legal validity it remains an e.d.v. On the other hand, one variety which first has been assumed to be independently developed can be later on claimed and proved to be an e.d.v. with all the consequences that that proof implies, for the variety itself and for those essentially derived from it.

   An e.d.v. remains an e.d.v. forever. Even if the protection period of the i.v. has been exhausted, a variety derived from the first variety in a chain of essentially derived varieties remains an e.d.v. and the remaining varieties in the chain will still be regarded as essentially derived from the i.v. The reason for this lies in the spirit of the concept of dependency. This very new principle has mainly been introduced to protect more efficiently the initial breeder and not those who make derivations from his work.

B. Special Interpretations of Article 14(5)

1. The principle of dependency only exists in favour "of the protected variety" [see Article 14(5)(a)(i)].

   This means:

   a) The initial variety must be a protected one.

   b) Dependency can only exist from one protected variety alone.

   c) A dependent variety can be directly derived from the i.v. or from a variety that is itself predominantly derived from the i.v. [see Article 14(5)(b)(i)]. As already mentioned under A.7, dependency only exists in relation to the i.v.

2. ASSINSEL interprets Article 14(5)(b) ("a variety should be deemed to be essentially derived from i.v.") in that the e.d.v. effectively has to meet the following three requirements in relation to the initial variety while retaining the expression of its essential characteristics:

   a) clear distinction in the sense of Article 7;

   b) predominant derivation;

   c) genetic conformity.

   If one requirement is not fulfilled, there will be no essential derivation.

3. The methods of breeding which can be regarded as leading to an e.d.v. may differ from species to species, or even within a species. This will result in different thresholds being required to characterize dependency.

C. General Rules for Burden of Proof

a) According to the general rules of burden of proof, each party has the burden of proof for those requirements of the legal provision which is favourable to him. That means that the owner of the i.v. has to prove all requirements of dependency.

b) If the owner of the i.v. can prove the requirement of "genetic conformity" his burden of proof regarding "predominant derivation" is facilitated by the so-called "prima facie" proof (proof by evidence). The existence of "genetic conformity" gives the presumption that the second breeder has predominantly derived his variety from the i.v. On the other hand, if the owner of the i.v. can prove the requirements of "predominant derivation", the existence of "genetic conformity" can be also presumed.

For the proof of evidence to justify essential derivation, the following elements should be sufficient:

- genetic conformity or
- close relationship e.g. in phenotypical characteristics or
- only small differences in some simply inherited characteristics.

c) If the owner of the i.v. has fulfilled the above requirements, then the second breeder has to prove:

- no genetic conformity or
- no predominant derivation.

ASSINSEL STATEMENT FOR THE QUESTION OF ENTRY INTO FORCE OF THE NEW CONCEPT OF ESSENTIAL DERIVATION (E.D.) OF ARTICLE 14 PARA.5 OF THE 1991 REVISED TEXT OF THE UPOV CONVENTION IN NATIONAL LAWS

Adopted by the General Assembly of ASSINSEL in Nairobi, on May 28, 1993

After careful consideration of the economic, legal and technical aspects involved, the following is concluded:

In the case of national implementation of the 1991 Convention (see chapter IX of the 1991 revised text of the UPOV Convention) the new concept of E.D. should include the following:

1. All existing Plant Breeder's Rights (PBR) before implementation should be regarded as independent and should enjoy all the rights given by the revised Convention.

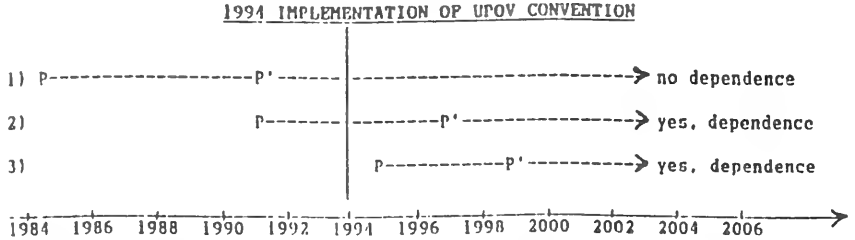
2. Nevertheless, only where such a protected plant variety is not itself an essentially derived variety (E.D.V.) should the holder enjoy the rights under article 14, par. 5 of the revised Convention.

3. All E.D.V. for which an application for PBR has been filed or acts mentioned in article 14, par. 1 of the revised Convention have been done first on or after the implementation date should be subject to the new concept of E.D. and dependency.

4. The date of filing an application for PBR should be decisive and not the date of granting PBR.

5. There should be no difference between the date of application and acts with the plant variety because at the date of application it can be imputed that acts have already been done with this variety (e.g. production of propagating material).

For elucidation purposes the following (possible) time diagram is annexed



P = original/initial variety (protection starts)
P' = from P essentially derived variety (application date or first acts)

Sec. 12. Transitional Provisions.

To the extent that this Act provides increased rights and term of protection to protected varieties under Sections 83(b), 111(c) and 113, any variety for which a certificate of plant variety protection has been issued prior to the effective date of this Act, and any variety for which an application is pending on the effective date of this Act shall ***enjoy such increased rights and term of protection with respect to any saved seed grown on or after the effective date of this Act and with respect to any variety referred to in Section 111 (c) for which the acts referred to in Subsections 111(a)(1) through (10) were first performed on or after the effective date of this Act. The rights of such varieties with respect to saved seed grown before the effective date of this Act and with respect to varieties referred to in Section 111(c) for which any of the acts referred to in Subsections 111(a)(1) through (10) were first performed before the effective date of this Act shall*** continue to be governed by the provisions of the Plant Variety Protection Act in effect on the day before the date of this Act: ~~Provided, however, that if a pending application is withdrawn and refiled after the effective date of this Act, eligibility for protection and the terms of protection shall be governed by these amendments.~~

Discussion

The revisions to proposed Section 12 reflect an industry-favored implementation of the transition from the current PVP Act to the revised PVP Act which is consistent with the 1991 text of the UPOV Convention. Plant Variety Protection provides the owners of protected varieties with rights to stop the sale and other commercialization of infringing varieties. Under the 1991 text of the Convention, the rights afforded protected varieties are "upgraded:" They enjoy a slightly longer term of protection (20 years versus 18 in the case of most crops; 25 years in the case of trees and vines), and broader rights against infringement, including a prohibition on sales of farm-saved seed and rights against infringement by "essentially derived varieties" as defined in the Act. Under the industry-favored transitional implementation of the new convention, these "upgrades" become available immediately for existing protected varieties, but only when the owner enforces his rights against sales of farm-saved seed grown on or after the effective date of the Act, or against essentially derived varieties for which infringing acts (such as sales) first occurred on or after the effective date of the Act. With respect to pre-existing farm-saved seed and pre-existing essentially derived varieties, i.e., varieties for which one or more of the potentially infringing acts (such as sale) occurred prior to the effective date of the Act, the rights of the owner of the protected variety continue to be determined under the old provisions of the PVPA.

This transitional implementation is endorsed by the American Seed Trade Association and the International Association of Plant Breeders for the Protection of Plant Varieties.

Senator KERREY. Just for the record, Mr. Robinson, could you state your full name and your company?

Mr. ROBINSON. Yes. My name is Rob Robinson. I am with the J.C. Robinson Seed Company from Waterloo, Nebraska, executive vice president, and also chairman of the Intellectual Property Rights Committee for the American Seed Trade Association.

Senator KERREY. Thank you.

The next individual to testify will be Don Latham, who is a farmer and a seed producer with the Latham Seed Company in Alexander, Iowa.

STATEMENT OF DONALD E. LATHAM, FARMER AND SEED PRODUCER, LATHAM SEED COMPANY, ALEXANDER, IA

Mr. LATHAM. Good afternoon, Mr. Chairman.

I am Don Latham, production manager and owner, along with two of my brothers, of Latham Seed Company located near Alexander, Iowa.

Latham Seed Company was started by my father and mother in 1947. We operate through a farmer-dealer network of some 450 local dealers in communities in Northern Iowa, Southern Minnesota, Eastern Nebraska, and South Dakota. We deal only with soybeans, currently offering 17 varieties of soybeans.

I am here today in strong support of the amendment to the Plant Variety Protection Act contained in S. 1406. Passage of this legislation will benefit small family-owned seed companies like ours and is good for the American farmer.

As a small family-owned seed company, research and development is a significant expense for us. On gross sales of slightly over $5 million annually, we have annual research expenses of more than one-half million dollars. This research expenditure enables us to breed and screen some 23,000 potential varieties each year.

From this work, we hope to come up with one or two new varieties which we can develop and market over subsequent years. It takes 8 to 10 generations from the original cross to bring a new variety to the marketplace, and its average life expectancy will be only 6–7 years before it will be replaced by more productive varieties.

The only way we have to recoup this substantial investment is through the retail sales by our local farmer-dealers. These dealers depend on the revenue generated by sales to others in their communities for part of their income. We help support their activities through education programs and advertising targeted towards other producers in their areas.

One threat to this locally beneficial relationship is the unauthorized sale of our varieties or those of other seed companies by farmers who do not incur any of the development costs and risks I have just mentioned.

This type of activity is exemplified in Iowa by a lawsuit currently pending between the Asgrow Seed Company and the Winterboers. According to court transcripts, in 1990 Becky and Dennis Winterboer planted 265 acres with two Asgrow PVP-protected soybean varieties. They harvested 12,037 bushels of soybeans and after cleaning, 10,529 merchantable bushels remained. In 1991, they sold

the entire 10,529 bushels as seed for about $8.50 per bushel. A comparable amount of Asgrow seed sold for about $16.50. The Winterboer's sales of the 10,529 bushels is enough to plant approximately 10,500 acres, or approximately 2 percent of Asgrow's Iowa market.

No seed company, whether it be Asgrow or Latham Seed Company, can do the research, the development, the advertising, the dealer education, the marketing, take all the economic risks associated with bringing a new variety to market and then have a third party with little or no expense copy their success and sell at half their prices. This not only hurts us as a small family-owned seed company, but our farmer-dealers, who go to significant expense of their own in servicing their farmer customers.

The positive amendments you are now considering will go a long way toward stopping damaging brown-bag sales while preserving the rights of farmers to save seed for their own use on their farms. In fact, farmers can even increase the acreage planted over the previous year's acreage. Under these amendments, the only things farmers cannot do is sell their crop as seed.

This issue is not one of big seed companies versus small farmers. The issue is how to adequately encourage and then protect the rights of those who expend their economic and personal resources in developing new and better varieties which benefit the American farmer in today's international market. Such protection is the only way that small companies like ours can continue to pour dollars into new research.

These amendments to the PVPA will help protect these rights as well as encourage seed companies in the development of newer varieties. This will help to make U.S. agriculture more competitive in the world market. U.S. farmers should be concerned that multinational companies with more resources will release new varieties only where they are afforded adequate protection. This point is particularly important as budgets for public university breeding programs continue to shrink.

One amendment proposed, Section 2541(7), would make conditioning of a protected variety an act of infringement. We encourage the proper handling and conditioning of farmer-saved seed and would hope that such activities would be permitted, but that knowingly conditioning seed that is intended for sale be made a violation of the act.

In summary, passage of S. 1406 is important to small seed companies like ours and it permits us to concentrate on what we do best, research, development, and marketing of new and better varieties of soybeans for our farm customers, rather than spending our limited resources on enforcing our rights.

Thank you for the opportunity to present my views this afternoon.

Senator KERREY. Thank you very much, Mr. Latham.

The next individual to testify is Dr. Vance Watson, executive vice president of the Association of Official Seed Certifying Agencies with Mississippi State.

STATEMENT OF VANCE H. WATSON, EXECUTIVE VICE PRESIDENT, ASSOCIATION OF OFFICIAL SEED CERTIFYING AGENCIES, MISSISSIPPI STATE, MS

Mr. WATSON. Thank you, Mr. Chairman, and good afternoon.

My name is Vance Watson and I represent the Association of Official Seed Certifying Agencies, commonly referred to as AOSCA. This association is comprised of 42 member states in the United States, Canada, and New Zealand, and we have its central office located in Mississippi. This organization serves over 23,000 certified seed growers in this country. AOSCA is the organization authorized and charged under the Federal Seed Act with responsibility in this country for certifying seeds as to genetic standards.

On behalf of the members of our organization, I am pleased to be here today to support the intent and the spirit of S. 1406.

Senator I also want to express my appreciation and thank you for the significant time and efforts that you and your staffs have devoted to the discussions and preparing the amendments of S. 1406.

In my opinion, the Plant Variety Protection Act of 1970 is one of the most significant pieces of legislation to impact plant variety development and the seed industry in this country during this century. As you so aptly stated, Senator, in your opening comments, PVPA brought forth much venture capital from the private sector and helped to transform and shift many of the traditional plant breeding roles of the public institutions to the private sector.

This provided opportunities for industry to develop state-of-the-art commercial plant breeding programs for several species of crops and provided our farmers with a wide choice of quality products. It also helped the United States gain an undisputed world leadership position with respect to plant variety development.

Concurrently, the public research institutions and agencies were afforded the opportunity to focus on development of new plant breeding technologies, development of germplasm sources, and training of future plant breeders.

As other countries mimic the PVPA and develop their own improved plant protection laws, plant variety development and plant protection in this country require and deserve increased attention to protect our world leadership position. We fully support the intent of S. 1406 to bring us into full compliance with the 1991 UPOV Convention dealing with plant breeders' rights.

The impact of plant variety protection can easily be documented if one examines the national certification records of our association. We just completed our 75th year in existence, and the acres that were placed under certification during the first 50 years of our existence increased at a very steady rate. But if we examine the 10-year period immediately following passage of PVPA in 1970, we can readily see a 25-percent increase in acres certified, and equally as dramatic, in the period from 1980 through 1992 we see a 25-percent decrease in the number of acres certified.

We attribute most of this decrease in acres certified to the flagrant, open violations of the current act through unauthorized reproduction of protected varieties, commonly referred to as brown bagging.

AOSCA supports very strongly the provision in the new UPOV Convention that a farmer may save seed for his or her own use on their own holdings and also the provision that those seeds may not be sold for further propagation.

Again, my analogy for this reasoning is the same that Senator Harkin used earlier. Senator Cochran and I from Mississippi are privileged to have in our State the distinguished author John Grisham. John has written a couple of novels that most of you may have read or own, called "The Firm" and "The Pelican Brief." If you or I own a copy of those novels, we can do anything that we choose with that book, but I don't think that John would want us to reproduce and sell those novels without his permission.

Certainly those of us in AOSCA view the issuance of a plant variety protection certificate to ensure similar protection for plant breeders and the varieties that they develop.

The impact on our farmers of decreased participation in certification since 1980, we feel, is to deny them the opportunity to purchase products that are verified by an independent third party source such as AOSCA as to assurance of genetic identity and the quality of seed they purchase.

We firmly believe that the provision of an individual not being allowed to sell seed of a protected variety will result in increased quality, number, and kinds of seed available to our farmers, and in the long run, we feel like this will enhance the entire production of United States agriculture capabilities.

Mr. Chairman, we in AOSCA also respectfully submit for your consideration our concerns with the transition Section 12 of your amendments. We realize that many will interpret this as having two sets of laws or standards. We also realize the practicality of this situation. At the bare minimum, we do urge you to modify Section 12 to at least include those varieties that are currently on file or in various stages of examination in the Commissioner's office at this time.

Mr. Chairman, we also think that there is sufficient need to amend Section 83(a) of the current act which deals with the content and term of plant variety protection. This is a noncontroversial issue dealing with the applicant having the ability to change the number of generations that he specifies on his original application. In many cases, we run into very unforseen commercial seed production problems, or in the case of natural disasters such as you had with the Mississippi River in the Midwest this year.

The only options currently available to an applicant that discovers he has made a mistake or needs to change the number of generations is to continue with the mistake that he originally made or currently to abandon any protection that he had.

We appreciate the opportunity to be here today and, as an organization, express our support to you for the final version of the bill that you do adopt.

Senator KERREY. Thank you very much, Dr. Watson.

Our next witness is David Svik, who is the President of the Association of American Seed Control Officials with the Nebraska Department of Agriculture.

STATEMENT OF DAVID F. SVIK, PRESIDENT, ASSOCIATION OF AMERICAN SEED CONTROL OFFICIALS, NEBRASKA DEPARTMENT OF AGRICULTURE, LINCOLN, NE

Mr. SVIK. Thank you.

Mr. Chairman and members of the subcommittee, I am David Svik with the Nebraska Department of Agriculture. As president of the Association of American Seed Control Officials, or AASCO, I want to thank you for the opportunity to testify on behalf of our association.

AASCO is a nonprofit, nonpartisan organization of seed regulatory officials with members from all 50 State departments of agriculture, the Federal Seed Branch, and Agriculture Canada. Our association was organized in 1949 and continues to promote and establish the basic labeling requirements for State seed laws through our model seed law called RUSSL, which serves as a guideline for member states.

The primary purpose of seed law enforcement is consumer protection. AASCO works closely with other organizations, such as the Association of Official Seed Certifying Agencies, the Association of Official Seed Analysts, and the American Seed Trade Association to promote and foster uniformity of policies and labeling procedures for orderly marketing of seed throughout North America.

All State departments of agriculture regulate the labeling of seed offered for sale through their individual State seed laws. It is for this reason that I am here today to testify on the proposed amendments to the Plant Variety Protection Act, S. 1406, on behalf of AASCO.

AASCO supports S. 1406, which would amend the Plant Variety Protection Act to make it consistent with the International Convention for the Protection of New Varieties of Plants of March 19, 1991.

In 1992, AASCO also passed a resolution of support of the 1991 UPOV agreement and submitted it to the National Association of State Departments of Agriculture, requesting that NASDA adopt our resolution on the 1991 UPOV agreement as a formal action policy. NASDA did adopt this resolution at their September 21, 1992 annual meeting.

The association which I represent is vitally concerned that seed labeling be uniform and acceptable to all States. This is especially important since seed is routinely produced in one State and marketed in several States.

Our understanding of S. 1406 in its present form is that the amendments currently under consideration would be applicable to only those varieties receiving protection after the implementation of the bill into law. All prior-protected varieties would continue to be protected by provisions currently in effect.

AASCO strongly believes that in the interest of an orderly Interstate Marketing Program, both prior-protected varieties and those varieties yet to receive protection must be governed by the same requirements or else there will be significant disparity in the enforcement of the act. It would be virtually impossible to develop and apply a fair, equitable, and practical enforcement program based solely on the date a variety receives protection.

Therefore, AASCO strongly supports the proposed amendments to the Plant Variety Protection Act be applicable to all protected varieties, irrespective of the date protection was received.

Again, thank you for allowing me to testify on behalf of AASCO on this very important piece of legislation covering seed labeling. Copies of my testimony have been provided to all members and I will be pleased to answer any questions from the subcommittee.

Senator KERREY. Thank you, Mr. Svik. Your entire testimony will be a part of the record.

I am going to ask the remaining five witnesses to all come up and offer their testimony and then we can perhaps have a discussion of the bill more clearly that way.

Dr. David Douches, Research Geneticist and Potato Breeder, representing the National Potato Council; Dr. Robert Barnes, Executive Vice President of the American Society of Agronomy, the Crop Science Society of America, and Soil Science Society of America from Madison, Wisconsin; Mr. Bryce Neidig, President of the Nebraska Farm Bureau; Ms. Becky Winterboer, a farmer from Milford, Iowa; and Ms. Hope Shand, Research Director of the Rural Advancement Foundation International from Pittsboro, North Carolina.

Dr. Douches, if you would give your testimony next, please.

STATEMENT OF DAVID S. DOUCHES, RESEARCH GENETICIST AND POTATO BREEDER, REPRESENTING NATIONAL POTATO COUNCIL, DEPARTMENT OF CROP AND SOIL SCIENCES, MICHIGAN STATE UNIVERSITY, EAST LANSING, MI

Mr. DOUCHES. Mr. Chairman, thank you very much.

My name is Dr. David Douches and I am a research geneticist and potato breeder at Michigan State University, East Lansing, Michigan. I would request that my full testimony be included for the record.

Senator KERREY. It will be included.

Mr. DOUCHES. Today I am testifying on behalf of the National Potato Council, which is the only trade association representing 10,500 commercial potato growers in 50 States. The Potato Association of America also supports my testimony, and I ask that a letter from its president, T. Richard Tarn, be included in the record.

Senator KERREY. Without objection, it will be included.

[The letter appears in the Appendix.]

Mr. DOUCHES. Thank you.

The question we ask in general is why do we need to have the most important vegetable crop, like the potato, included in the Plant Variety Protection Act.

First of all, we have seen Canada institute plant breeders' rights upon potato cultivars in a form similar to the UPOV Convention and also recommend that the United States have a similar form of protection to unify North American intellectual property rights for this crop. The equivalent form of protection in the United States is the Plant Variety Protection Act. A common form of protection for potatoes among UPOV countries allows the United States to compete in a global market.

Secondly, since the 1920s, potato breeding and germplasm research in the United States has been the primary responsibility of the USDA and land-grant institutions. In some States, there has been a reduction in funding in public breeding efforts and a loss of breeding programs in some States, and these States include Nebraska, North Dakota, Indiana, Pennsylvania, Louisiana, Washington, and North Dakota in the past decade.

We feel that with the reduction in funding we need to explore other avenues to gain support for these programs and we feel variety protection, hence royalty collection, would be a means of support and also promote technology transfer.

Recently, the private sector has invested in biotechnology-based research to develop new potato varieties, and the industry has based these upon publicly-released varieties. The potato crop is on the forefront of genetic engineering, and there are many field tests currently going on to test this crop for insect resistance to reduce pesticide use.

The influx of the private variety sector development requires that the public potato breeders collaborate with this sector of researchers so that the best germplasm reaches the growers. The high investment costs of this research requires that the private sector recoup their investment and to seek means to protect their invention.

Moreover, this relationship requires both breeders and genetic engineers to have equivalent levels of intellectual property protection.

Why does the PAA and the National Potato Council desire to have the potato included in the Plant Variety Protection Act? The United States was the first country to make specific provision to protect new plant varieties through the Plant Patent Act of 1930. The potato was excluded from this form of protection at that time.

Today in the United States, as you stated earlier, four forms of protection exist: trade secrecy, the Plant Patent Act, the Plant Variety Protection Act, and utility patents. We have been able to protect some potato varieties and germplasm with utility patents. However, this means to protect them was done by default, not by design.

However, the ability to utilize utility patents is in question at the moment. Frito Lay, a private company, and North Dakota have each attempted to utilize utility patents to protect their varieties and have been denied. So at this time, we really do not have any form of protection to protect our potato varieties.

The problems that the patent office sees is the question of nonobvious and the problem of an enabling disclosure for the potato. Also, in our opinion, we don't support the utility patent as a form of protection because it doesn't address the issue of research exemption nor essential derivation. We feel that we need a better form of protection.

My table in the written testimony summarizes some of these issues in a concise manner.

The potato, being an asexually propagated crop, should have been protected through the Plant Patent Act in 1930. It was not included in that statute. However, the PPA is a 60-year-old statute that does not address the technological advances that have been

made in plant breeding, propagation, and biotechnology in the potato.

One major weakness of the Plant Patent Act is the lack of a research exemption. Germplasm exchange is a key to further genetic advance. Statutes that sequester this exchange would have a negative impact upon genetic advances in the potato.

Another key issue is essential derivation. With advances in biotechnology, essential derivation puts the plant breeders on par with the genetic engineers. The 1991 UPOV Convention addresses this issue as being considered part of the PVPA revisions. The Plant Patent Act does not address essential derivation.

Lastly, the Plant Variety Protection Act application can be submitted by the breeders themselves and does not require an attorney for submission.

The UPOV Convention, from the potato point of view, is an agreement between countries that grant a minimum level of protection for plant varieties on the basis of standard criteria. The PVPA of 1970 provides a statute that most closely resembles the plant breeders' rights defined by UPOV, but is currently limited to only true-seeded propagated crops.

Interestingly, other than the United States and the Republic of Korea, there is no distinction between mode of reproduction and form of protection in the statutes of other nations.

To the potato breeders, essential derivation is a critical concept in the revision of breeders' rights defined by the UPOV 1991 revisions. With the 1991 UPOV agreement, it is possible that a modified variety will be defined as essentially derived and fall within the scope of protection of the protected variety. It is envisioned that this new balance established between the two systems will facilitate the exchange of technology and germplasm between breeders and biotechnologists.

A major concern to the breeders is the germplasm exchange, and to maintain germplasm exchange, each patent should contain a specific clause allowing use for crossing. However, with utility patents or the Plant Patent Act, this clause is not legislated, thus difficult to enforce. The Plant Variety Protection Act is the only form of intellectual property rights that explicitly provides research exemption, hence germplasm exchange.

In conclusion, we have attempted to use utility patents as a form of intellectual property rights for potato cultivars today. However, utility patents are not an adequate form of protection in most cases and have been denied recently by Frito Lay and North Dakota's varieties. Therefore, we would like to find another form of protection for the potatoes.

The Plant Patent Act is not the best form of protection for potatoes, either. It does not provide the adequate level of protection, it lacks the essential derivation concept, requires attorney counsel, and has no research exemption.

The Potato Association of America and the National Potato Council support the form of intellectual property rights for plants outlined in the 1991 UPOV Convention. The PAA and the National Potato Council also advocate the inclusion of the potato in the Plant Variety Protection Act under the revisions required by the 1991 UPOV treaty. This form of protection allows the breeder to

directly obtain protection, is less costly, affords an adequate level of breeders' rights while explicitly legislating research exemption for breeding.

If potatoes are included in the Plant Variety Protection Act, the potato breeders would then have adequate protection for potato germplasm which is comparable to other UPOV countries which conduct potato breeding. Therefore, we can compete globally and be in alignment with Canada in intellectual property rights for potato.

Moreover, we will have a form of protection that puts us on par with biotechnologists' means to protect their product, which will promote germplasm exchange between these two groups.

Thank you for the opportunity to present our views this afternoon.

[The prepared statement of Mr. Douches follows:]

PREPARED STATEMENT OF DAVID S. DOUCHES, RESEARCH GENETICIST AND POTATO BREEDER, REPRESENTING NATIONAL POTATO COUNCIL, DEPARTMENT OF CROP AND SOIL SCIENCES, MICHIGAN STATE UNIVERSITY, EAST LANSING, MI

INTRODUCTION

The National Potato Council (NPC) and Potato Association of America (PAA), support the inclusion of the potato (*Solanum tuberosum* subsp. *tuberosum*) in the Plant Variety Protection Act (PVPA) under the revisions required by the 1991 UPOV Convention.

The National Potato Council is the only trade association representing 10,500 commercial growers in 50 States. Our growers produce both seed potatoes and potatoes for consumption in a variety of forms.

The PAA's main objective is the collection and dissemination of the best available technical and practicable information relating to all aspects of potato production and utilization, including breeding, genetics and certification.

The potato is the fourth most important food crop in the world following rice, wheat, and corn. It is also one of the leading crops in productivity on a per acre basis. The potato is grown in almost all the countries in the world and forms the staple of many societies. Close to 300 million metric tons are produced annually worldwide. In the United States, it is the leading vegetable crop in acreage and farm value, with 1.2 million acres planted in 1991 yielding 418,000,000 cwt and over 2.5 billion dollars in sales. One hundred thirty-two pounds of potatoes are consumed per person per year. The potato is very amenable to biotechnology manipulations (i.e., genetic engineering) and is one of the leading crops in which genetically engineered plants, destined for commercial use, are being field tested.

Why do we need to have an economically important crop like potato included in the PVPA?

A number of factors have contributed to this view by the PAA and NPC. First of all, we have seen Canada institute plant breeders' rights upon potato cultivars in a form similar to the UPOV Convention and also recommend that the United States have a similar form of protection to unify North American intellectual property rights. (The equivalent form of protection in the United States is the PVPA.) A common form of protection for potatoes among UPOV countries allows the United States to compete in a global market. Secondly, since the 1920's, potato breeding and germplasm research in the United States has been the primary responsibility of the public institutions (USDA and land-grant universities). In some States there has been a reduction in funding of public breeding efforts and also a loss of public potato breeding programs in the past few years. The reduction in funding has led the public institutions to find alternate means of funding programs and to explore various avenues to achieve program viability. One means of program support is royalty collection via the protection of varieties. Recently, the private sector has invested in biotechnology-based research to develop new potato germplasm for the industry based upon publically released varieties. The influx of the private sector variety development requires that public breeders collaborate with this sector of researchers so that the best germplasm reaches the growers. The high investment costs of this research requires the private sector to recoup their investment, and to seek means to protect their invention or innovation (i.e., germplasm, variety, or gene).

Moreover, this relationship requires both breeders and genetic engineers to have equivalent levels of intellectual property protection.

Why does the PAA and NPC desire to have the potato included in the PVPA?

The United States was the first country to make specific provision to protect new plant varieties (PPA 1930; in 35 U.S.C., sections 261 to 264), which is embodied through the Plant Patent Act of 1930. The potato was excluded from this form of plant protection. Today, in the United States, we have four forms of protection available for plant material. These are: trade secrecy, The Plant Patent Act of 1930 (PPA), The Plant Variety Protection Act (PVPA) of 1970, and utility patents.

Currently, we can protect potato varieties and germplasm with utility patents, therefore the means already exist to obtain intellectual property rights (IPR) for potatoes. This means to protect potatoes in the United States was nonexistent until utility patents began to be granted to plants in the mid-1980's. Hence, the development of IPR for potatoes through utility patents occurred by default, not by design. **The question the PAA asked is whether this form of IPR is what is needed by the industry, researchers and breeders, or do we need other forms of protection?**

In general, decisions concerning the form of protection to seek for a particular plant should involve:

1. Consideration of the species in question.
2. What form of reproduction occurs.
3. Whether the plant material is novel for the particular form of protection.
4. Whether the "innovation" satisfies the criteria of the patent system.
5. The expense or difficulty of securing one form of protection.
6. The scope of protection that is necessary to optimally exploit the plant material.

For brevity, the table below compares some of the key points of three current forms of plant protection available in the United States. (Trade secrets are not applicable to potatoes.) See the appendix for some discussion on the various forms of protection.

Utility Patents	Pl Var Prot Act (PVPA)	Plant Patents (PPA)
Protects genes or unique characteristics	Protects sexually propagated varieties	Protects clonal varieties
For new industrial applications that are nonobvious and subject to enabling disclosure	For varieties that are distinct, uniform, stable and named	For varieties that are distinct, novel, nonobvious
Covers unique feature	Covers seed	Covers whole plants
No research exemptions	Research exemption	No research exemption

The potato, being an asexually propagated crop, should have been protected through the Plant Patent Act of 1930 (PPA). It was not included in that statute. The American Association of Nurserymen (AAN) and the National Association of Plant Patent Owners (NAPPO) are suggesting the PPA be amended so that PPA protection covers plant parts rather than whole plants and that the exemption of "tuber-propagated crops" like the potato be eliminated. However, the PPA is a 60-year-old statute that does not address the technological advances that have been made in potato plant breeding, propagation, and biotechnology. One major weakness of the PPA is the lack of the research exemption. The NPC and the PAA, with strong conviction, support a research exemption because we believe that germplasm exchange is the key to further genetic advances. Legislation or statutes that sequester this exchange would have a negative impact upon genetic advances in the potato. Another key issue is essential derivation. With advances in biotechnology, essential derivation puts the plant breeders on par with the genetic engineers. (A discussion on essential derivation can be found below.) The 1991 UPOV Convention addresses this issue and is being considered a part of the PVPA revisions. The PPA does not address essential derivation. Lastly, the PVPA application can be submitted by the breeders themselves, whereas a PPA claim does require lawyers for submission.

POTATO PERSPECTIVES ON UPOV

The UPOV (Union pour la Protection des Obtentions Vegetales) Convention is, in effect, an agreement between countries (currently about 23) to grant a minimum level of protection for plant varieties on the basis of standard criteria. Breeders' rights are granted upon a variety when it is deemed **novel, distinct, uniform and stable.** A minimum of 15 years of protection is given for most plants. Any protected

variety must be freely available for breeding, such as the source of initial variation in developing other varieties (part of the research exemption clause). The United States signed this agreement and the 1978 revision is currently in effect. However, this does not mean that our statutes are in alignment with the UPOV treaty for all species and genera (such as the potato).

Each country has its own set of laws to protect plant material to be in alignment with the UPOV agreement. The PPA and PVPA are the U.S. statutes intended to be part of this system of international protection of rights to plant properties usually referred to as "breeders' rights." The U.S. laws for plant IPR are not in alignment with most UPOV countries. Changes to the PPA are necessary to bring the PPA into compliance with the 1991 UPOV Convention. The PVPA of 1970 provides the statute that most closely resembles the plant breeders' rights defined by UPOV; however, only true-breeding seed crops are protected by the PVPA. **Interestingly, other than the United States and Republic of Korea, there is no distinction made between protection and mode of reproduction.**

Technology to genetically improve plant material has advanced; therefore, changes in the laws were made to have equitable levels of protection, the reason being that the benefits to be derived by conventional plant breeding and from the new biotechnologies are cumulative and not separate. One cannot replace the other. It was desirable that equitable systems of incentive be created for both the new biotechnologies and for the results of plant breeding. Moreover, it was essential that systems of plant variety protection be created or maintained which are complementary to patent protection for biotechnological inventions.

The United States has signed the revision of the 1991 UPOV Convention which mandates several changes in the U.S. law. The changes are:

1. Requirement that all member countries, after certain transitional periods, protect varieties of all plant genera and species.
2. An increase in the term of protection to 20 years.
3. Extension of the scope of protection to harvested plant parts.
4. Limitation of the farmers' exemption to prohibit "over-the-fence" sales.
5. Expansion of the definition of breeders' rights to include the reproduction of the protected variety and sale of a variety derived from the protected one if the variety expresses the "essential characteristics" of the protected variety. Simply stated, the variety which is "essentially derived" from a protected variety cannot be exploited without the authorization of the breeder of the protected variety. Essential derivation includes the selection of a natural or induced mutant, or a somaclonal variant, backcrossing, selection of an individual variant from plants of an initial variety, or transformation by genetic engineering.

To the potato breeders, essential derivation is a critical concept in the revision of breeders' rights defined by the UPOV 1991 revisions. For example, if a plant breeder inserts a patented gene into his/her variety, the resulting variety could fall within the scope of the patent enabling the patentee to prohibit the exploitation of the variety by the breeder. On the other hand, if the patentee inserts the patented gene into a PVP-protected variety, the breeder of the variety has no possibility at present to forbid the exploitation of that variety. With the 1991 UPOV agreement, it is possible that the modified variety will be defined as essentially derived and fall within the scope of protection of the protected variety. It is envisioned that this new balance established between the two systems will facilitate the exchange of technology (and/or germplasm) between plant breeders and biotechnologists.

HOW CAN WE MAINTAIN FREE EXCHANGE OF GERMPLASM?

A major concern to the potato breeders is the maintenance of a free exchange of germplasm. Traditional plant breeders fear that patents on genes and other biotechnology products would deprive them of sources of germplasm for classical recombination and breeding towards cultivar development. To maintain free exchange of germplasm, each patent should contain a specific clause allowing use for crossing, however, this clause is not legislated, thus difficult to enforce. Presently, the Breeding and Genetics section of the PAA encourages holders of potato patents to allow breeders to use the patented varieties in breeding programs directed towards commercialization of new varieties, without restrictions and without the threat of infringement. The PVPA is the only form of IPR that explicitly provides a research exemption, hence, germplasm exchange.

REVISING IPR FOR POTATO

At this time, potato cultivars can be protected as utility patents under the Patent Act in the United States and in Canada under the Plant Breeders' Rights Act (PBRA). Those are not equivalent in the level of protection nor do they have similar standards for documentation and release. The Canadian PBRA provides the required varietal protection, enables the breeder to collect royalties, and recognizes the free availability of germplasm for use in further crossing. Their IPR for potatoes were developed to be in alignment with the 1978 UPOV treaty. The PVPA is the corresponding legislation in the United States to provide breeders' rights similar to Canada. If potatoes could be protected through the PVPA we would have essentially equivalent systems of varietal protection in North America. The PAA and NPC support the inclusion of the potato in the PVPA legislation that is currently being revised to be in alignment with the 1991 UPOV Convention.

CONCLUSION

We have IPR for potato cultivars today, however utility patents are not an adequate form of protection in most cases. Besides their cost to submit a claim, there is no research exemption clause; therefore, by default utility patents sequester germplasm exchange. The inclusion of the potato in the PPA is not the best solution either for potato breeding. It does not provide an adequate level of protection (lacks the "essential derivation" concept), requires lawyers for submission of a claim, and has no research exemption.

The PAA and NPC support the form of intellectual property rights for plants outlined in the 1991 UPOV Convention. **The PAA and NPC also advocate the inclusion of the potato in the PVPA under the revisions required by the 1991 UPOV treaty.** This form of protection does not require the use of lawyers to obtain protection, is less costly and affords an adequate level of breeders' rights while explicitly legislating a research exemption for breeding. If potatoes are included in the PVPA the potato breeders then have adequate protection for potato germplasm which is comparable to other UPOV countries which conduct potato breeding. Moreover, we will have a form of protection that puts us on par with biotechnologists means to protect their product, which should promote germplasm exchange between these two groups.

APPENDIX

When we, the potato breeders, use the term intellectual property we are usually referring to a new potato cultivar. Intellectual property rights (IPR) is a concept that has guaranteed rights under the law which recognizes the ownership rights of a specific cultivar. If the breeder discloses the invention to the public, then the Government will grant the breeder time-limited rights to exclusive use and sale of the cultivar. It is with the hope that this information can then be used for further advance of science.

What is the rationale of IPR for plant material? The development of novel plants can be expensive and is a long-term investment. The U.S. Patenting Act of 1790 was created for the purpose of rewarding inventors by protecting their invention. The philosophy is that if there is no protection there would be little incentive to develop new products. The discussion below describes the various forms of protection we have available for plant varieties in the United States.

PLANT PATENTS

The PPA of 1930 provided protection for asexually propagated varieties. Before the passage of the PPA in 1930, it was the common perception that plants and other living organisms were not eligible for plant protection because living organisms were products of nature. In the drive to pass the PPA, advocates for the PPA pointed to the great agricultural and horticultural contributions to society by plant breeders. They wanted to remove the existing discrimination between plant breeder and industrial inventors. Interestingly, Luther Burbank, breeder of the Burbank potato, was a noted advocate of plant patents.

A plant patent may be granted to anyone who invents or discovers and asexually reproduces a variety which is **distinct, novel and nonobvious.** In practice, the application of the criterion of nonobviousness to plants seems to be linked to distinctiveness. For example, the candidate variety must be distinct by something more than a minor (cosmetic) characteristic. To obtain a plant patent the variety must be described as completely as reasonably possible and only one claim is permitted per variety. A plant patent application also requires a varietal name for the plant variety

for which protection is sought. The PPA specifically exempted plant patent applicants from the requirement of the enabling written description. A printed publication, which would bar a utility patent application, is not a barrier to a plant patent, on the ground that a printed publication was nonenabling for a plant. The person granted the plant patent is entitled to exclude others from asexually reproducing the plant, selling it, or using the plant that is reproduced. Plant patents may involve less attorney preparation and filing time than utility patents and may avoid deposit costs.

The definition of patentable subject matter is contained in section 161 of Title 35, in which tuber-propagated plants are excluded. The exclusion of tuber-propagated crops was a political rather than a scientific decision and was largely because at that time the potato industry did not support patents for potatoes. The rationale at that time was that for tuber-propagated plants, the propagating and edible portions of the plant are the same.

PLANT VARIETY PROTECTION

The PVPA of 1970 provides protection to sexually reproduced varieties that breed true (inbred or true-breeding plant varieties produced from seed). The purpose of this legislation was to extend IPR to sexually reproduced species not addressed in the PPA. F1 hybrids were excluded since trade secrecy affords protection for those varieties and because they usually do not meet the requirement for stability. To secure protection under PVPA, the variety must be **distinct, uniform, stable, and named.** The holder of the PVP certificate is entitled to prohibit others from selling or offering the variety for sale, importing or exporting the variety, or sexually multiplying the variety for marketing. The exemption to the breeders' right is that the protected variety can be used to develop another variety which is distinct from the protected variety. This concept is critical to germplasm exchange. Secondly, the farmer can save seed to plant the following year's crop. An unusual exemption that is a legal nightmare is one that the farmer, whose primary farming occupation is not seed growing, can sell to other such farmers without any obligation to the owner of the PVP certificate. At present, potatoes are specifically exempted from PVP, again, largely because the potato industry chose to not participate in IPR in 1970.

UTILITY PATENTS

Utility patents (or general patents) have only been granted since about 1985 for potatoes. As a result of the 1980 decision of the Supreme Court in *Chakrabarty* v. *Diamond* (206 USPQ 193) patents are available for inventions consisting of living material provided that a significant degree of human intervention was involved. For an invention to be patentable, it must be **new, industrial applicable, nonobvious, and subject to an enabling disclosure.** Although PPA covers sports, this is not true in the utility patents. Mere discovery is not adequate. The purpose of an enabling disclosure requires that the "invention" be described so that a person skilled in the art to which the "invention" relates can reproduce it. For living material, like plant cultivars, it is frequently impossible to precisely reproduce the same material. To deal with this problem, an applicant may deposit a sample of the relevant living material along with the description. These two components, description and deposit, make up the enabling disclosure. However, there is no depository for asexually propagated crops so the industry needs to answer this need. The holder of a utility patent is entitled to exclude others from unlicensed reproduction, using, or selling the "invention" throughout the United States. In other words, the utility patent is infringed upon if the patented potato cultivar is used for breeding.

The decision to obtain patent rights requires planning prior to applying for the utility patent. For example, your rights can be invalidated if more than 1 year passes between public disclosure of the cultivar and the patent application. One should also keep detailed records that should be dated and signed. In addition, tight control should be maintained over the cultivar. It should not be shared with anyone without a valid testing license and any plants of the cultivar should not be sold.

TRADE SECRETS

Trade secrets are appropriate primarily for protecting unique breeding methods or laboratory techniques that are never exposed to the public. Parental inbreds which are cross-pollinated to produce F1 hybrid cultivars are protected as trade secrets. A trade secret can be protected over a long period of time. As long as there is no public disclosure of the trade secret, it can be enforced. This form of protection, is usually not an option in considering an asexually propagated cultivar or inbred line of a plant variety where true-to-type "seed" is to be sold to the general public.

CURRENT STATUS OF PROTECTION

In summary, for a plant patent or PVP, the protection is straightforward. Protection extends to the variety described in the document. PPA covers the whole plant, whereas the PVPA covers only the seeds for the plant variety. If the statutes are changed to reflect the 1991 UPOV Convention (discussed above), plant parts would also be protected and derived varieties which retain essential characteristics would be covered. The utility patent system allows for claims of varying scope and emphasis depending on the nature of the invention and the prior art.

Several key provisions of the PVPA are not equivalent to any provisions in the utility patent or plant patent systems. These include mandatory license, a series of statutory exemptions for saved seed, an exemption for sales by persons whose primary occupation is farming (neighbor to neighbor sales), and a research exemption.

WHAT IS INFRINGEMENT?

Unlicensed propagation of a protected cultivar for any purpose is an infringement of breeders' rights except for neighbor to neighbor sales. A research exemption is recognized in the PVPA but is not implicit in the PPA or the utility patents. If someone infringes upon the patent the burden of proof falls upon the patent holder. Failure to pay royalties assigned to the plant cultivar is against the law and is no different from stealing. More detailed infringements upon the PVPA are described in Public Law 91-577.

ROBERT F BARNES, EXECUTIVE VICE PRESIDENT, AMERICAN SOCIETY OF AGRONOMY, CROP SCIENCE SOCIETY OF AMERICA AND SOIL SCIENCE SOCIETY OF AMERICA, MADISON, WI

Mr. BARNES. Mr. Chairman, members of the subcommittee, and colleagues, my name is Robert Barnes, executive vice president for the American Society of Agronomy, Crop Science and Soil Science Societies of America. Often we are called the tri-Societies. We are headquartered in Madison, Wisconsin.

The Crop Science Society of America, along with the American Society for Horticultural Science, cosponsored a workshop entitled "Intellectual Property Rights: Protection of Plant Materials" held the 26th to the 28th of January this year in Washington, DC. Joint sponsorship and partial support for that workshop was provided by the U.S. Department of Agriculture, Science, and Education.

The workshop built upon some ideas and topics that were brought out in a previous conference held in Anaheim, California, in 1989, which the tri-Societies, Horticultural Science, and other societies sponsored. There were 116 attendees at the 1993 workshop and they represented a very diverse array of individuals, representing the legal aspect, plant breeding and genetics, the seed industry, legal, political, public, private, a good array and other areas of interest.

And as a result, a special publication from the January conference will be issued and excerpted materials from the executive summary and the work group reports are packaged in this portfolio for the committee. I would at least encourage the executive summary to be entered into the record, if not the entire portion.

Senator KERREY. Without objection, it will be entered.

Mr. BARNES. The rights of inventors to secure legal property protection for their creative efforts and discoveries as provided in the U.S. Constitution. You have heard an array of discussion as to what has happened since that time.

Within the last decade, the options to exercise this right for plant-derived intellectual property have expanded to include utility

patents, and this has been exemplified as creating an array of issues and questions that must be answered.

The primary goal of the 1993 conference was to aid in the development of policies and procedures associated with plant-derived intellectual property which are publicly responsible and can provide the incentives needed to assure commercialization of new inventions.

I would like to share a summary of the overall workshop recommendations excerpted from pages eight and nine of this executive summary. There are five major topics. I would like to go through each one very briefly.

In terms of research funding and agenda setting, administrators should be better informed of the impact of intellectual property protection on shifts in the direction.of research programs and the impact of such directional shifts on the ability of these programs to meet the public's expectations.

Effective efforts are needed to counteract the serious erosion of support for agricultural research in the public sector. Better public funding would mitigate the negative impact of IPR on public research agendas by removing much of the pressure to acquire marginal research money from the private sector where IPR must, by business necessity, be an important part of the funding mechanism.

Public institutions should improve their ability and capacity to manage intellectual property to encourage rapid commercial development while at the same time protecting the public interest.

In education and communication, I would summarize in saying that the recommendations specify that information about intellectual property issues, such as model license or material transfer agreements, should be published more widely, especially within the public agricultural research system.

Society's recognition of the importance of science as a part of agriculture needs to be improved. Likewise, society's role in support of public sector agricultural research should be reemphasized.

In terms of germplasm exchanges and research exemptions, a major workshop topic, the recommendations are that an explicit research exemption should be provided with utility patents on plants, and in the absence of such an exemption, public institutions should be encouraged to grant a research exemption as an integral part of their institutional licensing policy. Further, deposits of all biological materials protected by IPR should become a part of the national germplasm system.

Fourthly, international considerations, developing countries should be encouraged to adopt effective plant breeders' rights and intellectual property laws. Country-to-country plant germplasm exchanges should be encouraged by whatever means appropriate, and equity issues in germplasm exchanges need to be addressed to assure continuation of such exchanges.

And lastly, but not least, farmer exemptions, the farmer exemption provision of the PVPA affords only a weak protection as envisioned by the workgroup participants and is of little value in many situations. Thus, utility patents are becoming more widely sought than would be the case with a stronger variety protection law. Also, the current U.S. act is inconsistent with the 1991 UPOV Convention.

The recommendation is that the PVPA of 1970 should be revised to conform to 1991 UPOV regarding farmer exemptions and essentially derived varieties.

That concludes the quotes from the recommendations, and I wish to thank you for allowing me to come and share the results of this 1993 workshop on the protection of intellectual property.

Although there may be questions that may have to be resolved in terms of the specific definitions of essentially derived varieties for various individual crops, we believe that the drafters of this legislation are to be commended in providing a concrete step through its amendment to come into compliance with the 1991 UPOV Convention. Its passage will fulfill one of the major recommendations of this workshop.

I thank you for the opportunity to be here.

[The "Intellectual Property Rights: Protection of Plant Materials" Executive Summary follows:]

EXECUTIVE SUMMARY

Intellectual Property Rights: Protection of Plant Materials

A workshop entitled "Intellectual Property Rights: Protection of Plant Materials" was held in Washington, DC, 26–28 January, 1993. The participants included 116 individuals from a broad range of disciplinary, professional, and administrative interests. Plenary speakers addressed such topics as goals of inventors, owners, and users; implications of non-U.S. protection, procedures, and practices for U.S. innovators; the status of intellectual property rights (IPR) protection; science-based identification of plant genetic materials; and national legislative issues.

Five work groups, each composed of a cross section of conferees, addressed critical issues and problems in the following areas: (i) licensing; (ii) research and farmer exemptions; (iii) germplasm and information exchange; (iv) ethical and social concerns; and (v) the impacts of property protection on research agendas. Each work group was asked to address current practices in both the public and private sectors and to develop recommendations for policies and educational programs that would improve the property protection system and mitigate any negative impacts on research and information exchange among scientists. The deliberations of each group were then summarized and the five highest priority issues from all groups were identified. Recommendations to address each of these priority issues were then developed, along with a description of expected outcomes if the recommendations were implemented.

LICENSING WORK GROUP

Licensing was recognized by both private and public sector attendees as the primary vehicle by which intellectual property rights are transferred from inventors to users. The private sector is generally comfortable with licensing; however, all recognize that there is uncertainty in evaluating the commercial potential of individual plant "inventions." One commonly used form of license is a material transfer agreement (MTA), which usually conveys the right to use plant materials for research purposes only. These agreements are encouraged.

Conferees encouraged consistent licensing practices at public institutions. Companies, however, often do not know what office or person to deal with in universities and often are not informed when potentially valuable material is available for licensure. Public institutions were encouraged to protect their intellectual property positions, and to offer a basis for licensing materials that might have commercial value. It was also recognized that exclusive license agreements, especially if a public institution is the licensor, can create tensions about germplasm access among plant breeders.

The manner in which plant breeders are treated, as inventors, was also perceived as a serious issue. A majority of participants believed it was important to encourage a uniform policy within and among public organizations. Team efforts could be discouraged if breeders and their coworkers are not treated uniformly. In many cases it is extremely difficult to determine "who is the inventor."

Concern was also expressed about the impact of exclusive licenses on the credibility that public organizations have with the general public. It is especially important

for public institutions to assure equal access to protected materials and to provide broad-based notification of all technology made available for potential licensing. The goal of licensing by public institutions should be to maximize public benefit; accruing revenue should be a lesser priority.

The licensing work group encouraged significant efforts in education and communication on intellectual property issues, especially licensing within public institutions. All staff should be well informed regarding options for protection, material transfer agreements, and institutional policies.

Lastly, licenses must be enforced. Agreements need a due-diligence clause or march-in clause and prohibitions against transferring licensed materials to third parties.

EXEMPTIONS WORK GROUP

Two types of exemptions are important to plant intellectual property—research and farmer exemptions. Research exemptions allow the use of protected intellectual property for true research purposes, without infringement. Farmer exemptions allow farmers to keep seed they produce from protected materials and use it for seeding purposes in their own enterprises. The Plant Variety Protection Act (PVPA) explicitly contains both research and farmer exemptions. The current farmer exemption in the PVPA allows a farmer to sell significant quantities of "surplus seed" to neighbors, a provision that has been the subject of considerable debate and litigation. It is generally accepted that a de facto farmer exemption exists—saving seed to use on one's own farm—due simply to the fact that enforcement would be impractical.

Utility patent law makes no provision for exemptions, and there has been no attempt to establish these exemptions within the law. Judicial decisions appear, however, to provide an exemption from infringement penalties for noncommercial research. Ambiguities arise in determining what constitutes "noncommercial" research. The same rules need to apply to public sector research as to private sector research, since universities often engage in research that can have commercial potential.

Conferees generally recognized that the current PVPA farmer exemption does not provide adequate protection for intellectual property. As a result, many inventors are seeking patent protection in lieu of plant variety protection. In addition, the current PVPA does not conform to the 1991 Convention of International Union for the Protection of New Varieties of Plants (UPOV). The farmer exemption provision of the 1970 PVPA requires revision so that farmers may continue to keep seed of protected varieties for their own use, and may be entitled to sell protected seed to others under unusual circumstances.

Much discussion centered around the question of "minimum distance," i.e., how different must a new variety be from a derived parent to qualify for protection under variety protection laws. There was no agreement on this issue among conferees, but it was agreed that some quantifiable minimum genetic distance should be required for a variety to qualify for protection as a new entity.

Patenting of plant materials may interfere with exchange of materials among researchers and among Government, university, and private laboratories. Such concerns could be allayed by a research exemption elective under utility patent law. Such an approach, however, would require revision of the patent law. An alternative approach would be for institutions desiring to provide a research exemption to adopt policies whereby an explicit research exemption is included in all licenses.

GERMPLASM AND INFORMATION EXCHANGE WORK GROUP

The goal of germplasm and information exchanges should be to make the best possible genetic resources available for use in solving world agricultural problems. Germplasm, broadly defined, includes all genetic materials and information associated with plants, such as landraces, advanced breeding lines, varieties, cloned genes, probes, nucleotide sequences, etc. Germplasm exchange ranges from very formal, with written and legally enforceable agreements, to informal exchange of materials between scientists with no exceptions or implied limitations on use of the materials.

Access to actual living plant materials, in the case of plant intellectual property, is more important than for other types of intellectual property. Higher plant germplasm is very difficult to describe verbally and impossible to duplicate simply from descriptions. Thus, improvement requires physical access to the germplasm itself, making exchanges extremely important to advancement of the science. Free exchange is understood to mean exchanges of an unrestricted nature, i.e., available to anyone, whereas *exchange for free* means that there are no costs associated with the

exchange. "Exchange" also implies that each of two or more parties makes contributions to the transaction.

All germplasm has the potential to contain protectable intellectual property and any limitations on ownership or commercialization opportunities must be made clear by the owners. This is especially important for materials deposited in the world's gene banks. For example, the International Agriculture Research Centers (IARC) of the Consultative Group for International Agriculture Research (CGIAR) hold germplasm that is considered the property of the world's people. By institutional policy, it is available to all without restrictions. Moreover, it is expected that recipients will not subsequently protect any of the materials received from the IARCs and make any derived materials unavailable.

Work group members identified three important issues. First, scientist-to-scientist exchanges should be as unrestricted as possible and can be facilitated by (i) encouraging the use of research exemptions by all public institutions holding utility patents for plants, (ii) amending the U.S. Plant Variety Protection Act to provide protection against essentially derived varieties, and (iii) encouraging public institutions to adopt the same policies regarding availability of the products of molecular biology as for more traditional germplasm. Second, country-to-country exchanges should be unrestricted and freely available for distribution in small quantities to bona fide scientists for research purposes. Third, a mechanism is needed to preserve and distribute restricted-use germplasm. The group recommended convening a study panel to develop a system to ensure public availability of restricted material once statutory protection had expired.

The conferees recommended providing better information to students and scientists in agriculture regarding (i) intellectual property rights for plants, (ii) procedures for accessing genetic materials in gene banks, and (iii) situations where patents can either increase or decrease germplasm accessibility. The conferees also recommended providing information to administrators on the types of protection available and their implications for germplasm exchange.

SOCIAL AND ETHICAL ISSUES WORK GROUP

The social and ethical issues work group identified seven main questions with regard to intellectual property protection of plant materials. These include (i) which agencies, institutions, and individuals should have access to germplasm; (ii) what are the effects of intellectual property protection on biodiversity; (iii) should plant materials be considered private property; (iv) what are the effects of plant protection policies on the social structure of agriculture; (v) what is the impact of intellectual property policy on the sustainability, stability, and well-being of the public sector research system; (vi) what rights should farmers retain after purchasing and growing protected seed; and (vii) what are the ethical considerations in educating the public and students about plant protection policies.

The following policies were recommended. (i) Educate students and the general public on the ethical dimensions of intellectual property issues. (ii) Policymakers and legislators should consider consolidating intellectual property laws for plants to foster uniform protection for all types of plant intellectual property. (iii) A research exemption policy (e.g., uniform material transfer agreement) is essential for maximizing and facilitating breeder access to germplasm worldwide. This policy should apply to arrangements between private parties as well as those between private and public parties. (iv) An arbitration mechanism should be considered to resolve disputes on plant intellectual property. (v) Continued public and quasi-public funding of public sector research is essential to minimize the perceptions of impropriety stemming from direct relationships between public agencies and private companies. (vi) Policies should be developed to provide just compensation to developing nations for use of germplasm obtained from within their borders.

RESEARCH AGENDA WORK GROUP

Many universities are under pressure to seek research funds from nontraditional sources. Potential income from patent royalty is one such source. More importantly, however, in recent years the private sector has been willing to fund specific research projects at many universities. In providing this research funding, companies generally expect preferential access to intellectual property that might be developed. As part of their contractual obligation on grants, universities agree to seek appropriate protection for intellectual property. Similar obligations exist on Federal grants.

The major impact of IPR on public sector research agendas is thus indirect. Because of public funding reductions, universities will undertake research for which

external funds are available. Availability of external funds often depends on the ability of the institution to provide access to appropriately protected intellectual property. The opportunity for public institutions to receive income independently from royalty bearing licenses can also influence the choice of problems researchers undertake. Conferees agreed that adequate funding for high priority research from public sources would minimize the impact of IPR on the public sector research agenda.

As with the work group on exchanges, there was concern on the part of some work group members that property protection might restrict the exchange of germplasm and information. Other members believed that protection of intellectual property would encourage exchanges that might not otherwise occur. Some suggested that a research exemption in patent law similar to that in the PVPA would diminish the negative impact of protection on research agendas.

Work group members encouraged the development of concise educational and informational packages on intellectual property issues that could be used in discussions with policymakers and administrators. They also suggested that the PVPA be revised to conform to the 1991 UPOV Convention. Finally, work group members encouraged organizing forums to encourage public debate on the effects of patents, of State and Federal funding, and of teaching demands on the research agenda.

OVERALL WORKSHOP RECOMMENDATIONS

A workshop synthesis group, consisting of work group chairs and rapporteurs, reviewed each work group's findings. The following are the five highest priority issues and recommended actions to address each of these issues.

Research funding and agenda setting. Concerns about the impact of IPR on research agendas emanate primarily from the public sector. Continued erosion in State and Federal funds for research has created pressures for university researchers to seek funds from other sources. Other sources include the private sector, from which funds can normally be secured much more readily if universities are willing to protect intellectual property and to grant licenses to sponsors of the research. Thus, the goals of long-term, university-funded specific projects or programs may be redirected (agenda modified) by the provider of the marginal funds needed to continue the program. This redirection of the research agenda is more directly related to funding than to intellectual property rights per se and is present regardless of whether the marginal funds are provided by a private sector entity or by a Federal granting agency. The provider of the marginal funds has a very significant impact on the direction of the research program.

The prospect of direct royalty income from the licensing of intellectual property may also affect the research priorities at some institutions and with some individual researchers.

Recommendations. Decisionmakers should be better informed on the impact of intellectual property protection on shifts in the direction of research programs and the impact of such directional shifts on the ability of these programs to meet the public's expectations.

Effective efforts are needed to counteract the serious erosion of support for agricultural research in the public sector. Better public funding would mitigate the negative impact of IPR on public research agendas by removing much of the pressure to acquire marginal research money from the private sector where IPR must, by business necessity, be an important part of the funding arrangements.

Public institutions should improve their ability and capacity to manage intellectual property to encourage rapid commercial development while at the same time protecting the public interest.

Education and Communication. Decisionmakers and researchers generally lack adequate information about IPR and appropriate institutional procedures and policies for exercising these rights without compromising public interests.

Recommendations. Information about intellectual property issues should be published more widely, especially within the public agricultural research system.

Society's role and support for public sector agricultural research needs to be reassessed. Scientific literacy and recognition of the importance of science as part of agriculture need to be improved.

Model license and material transfer agreements should be developed and copies should be made available to intellectual property managers.

Farmer Exemptions. The farmer exemption of the PVPA, as it currently exists, weakens this form of protection to the point that it is of little value in many situations. Thus, utility patents are more widely sought than would be the case with a stronger variety protection law. Also, the current U.S. act is inconsistent with the 1991 UPOV Convention.

Recommendations. The PVPA of 1970 should be revised to conform to 1991 UPOV regarding farmer exemptions and essentially derived varieties.

Germplasm Exchanges and Research Exemptions. Exchange of breeding and research materials among scientists is essential for continued progress in plant improvement. Intellectual property protection should not interfere with such exchanges.

Recommendations. An explicit research exemption should be provided with utility patents on plants. In the absence of such an exemption, public institutions should be encouraged to grant a research exemption as an integral part of their institutional licensing policy.

Deposits of all biological materials required for IPR should become part of the national germplasm system.

International Considerations. The international dimensions of IPR, including compensation to Third World countries, continue to be a source of contention among scientists.

Recommendations. Developing countries should be encouraged to adopt effective plant breeders' rights and intellectual property laws.

Country-to-country plant germplasm exchanges should be encouraged by whatever means appropriate.

Equity issues in germplasm exchanges, including compensation to countries of origin, should be addressed and appropriate steps taken to assure that exchanges are unfettered.

Senator KERREY. Thank you very much, Mr. Barnes.

The next witness is Mr. Bryce Neidig, President of the Nebraska Farm Bureau.

STATEMENT OF BRYCE NEIDIG, PRESIDENT, NEBRASKA FARM BUREAU AND MEMBER, AMERICAN FARM BUREAU FEDERATION BOARD OF DIRECTORS, WASHINGTON, DC

Mr. NEIDIG. Mr. Chairman, members of the subcommittee, I am honored to appear before you today to discuss the American Farm Bureau's position on proposed changes to the PVPA.

My name is Bryce Neidig. I am president of the Nebraska Farm Bureau and a member of the American Farm Bureau Federation Board of Directors. I raise corn, soybeans, and alfalfa on 700 acres in northeast Nebraska.

Before addressing the particular issues surrounding the PVPA, I want to thank you, Senator Kerrey and Senator Daschle, for your interest in this issue and we look forward to working with you and others and your staffs in strengthening the protection rights of breeders and in guaranteeing farmers access to superior seed varieties.

The Farm Bureau spent considerable time developing a position on the proposed changes to PVPA. As is often the case in the policy arena, this involved balancing competing interests. Farm Bureau policy reflects our members' commitment to protecting private property rights, including intellectual property rights. That protection had to be balanced with the need to retain a workable system whereby farmers who wish to save, condition, and utilize otherwise protected seed on their own holdings could do so with a minimum of disruption to normal operating practices.

Each of you have a copy of the statement which includes the following text of AFBF policy on the PVPA:

> In order to strengthen the rights of plant breeders and maintain farmers' ability to save seed for the land he or she farms and dispose of incidental amounts of seed, we will: One, support strong intellectual property rights pro-

tection to allow seed developers the ability to recover the costs of research and development of seeds; two, support restricting the sales of protected varieties, except for incidental sales, without the permission of the owner; three, support the present provision which allows a farmer to save seed for use on all the land that he or she farms; and four, support a provision to allow growers of seed varieties protected under the Plant Variety Protection Act to sell the seed according to local commercial law if the seed company fails to abide by the grower contract.

We oppose the expansion of breeders' rights through incorporation of the concept of 'essentially derived varieties' (as delineated by the 1991 UPOV) into the scope of protection afforded by the PVPA.

I will not read the entire policy of the Farm Bureau, but I will highlight the key provisions and how they relate to S. 1406.

American farmers have a strong vested interest in the advancement of genetic development through traditional breeding programs and through new technologies, including genetic engineering. Plagiaristic breeding practices and inequalities in the protection afforded breeders and geneticists have been detrimental to such genetic advancement.

AFBF supports extension of intellectual property right protection through the concept of essentially derived varieties, but is concerned that an inappropriate definition of what constitutes an essentially derived variety could hinder progress in genetic advancement.

The 1991 UPOV agreement incorporates a fairly vague but potentially restrictive definition of essentially derived varieties. Dr. Bruce Hunter of Ciba Seeds and a member of the Minimum Distance Committee of the American Seed Trade Association stated in a 1993 address to an intellectual property rights symposium on the protection of plant materials that: "It should also be noted that the Convention (referring to the 1991 UPOV) has deliberately not defined in detail the concept of 'essentially derived' in order to allow countries and organizations the opportunity to have considerable input into the interpretation and operation of this new concept."

S. 1406 uses the 1991 UPOV language to define "essentially derived." We believe that the proposed definition is sufficiently vague and undefined that it may unduly limit second generation innovation. The current definition places no limit on the extent of expression of essential characteristics which are required for a variety to qualify as essentially derived. Neither does it define what is meant by essential characteristics.

AFBF suggests the following changes to S. 1406 regarding Section 41, Definitions and Rules Construction, specifically the definition of essentially derived variety.

Subparagraph (iii) would be amended to require *virtually all* the "essential characteristics that result from the genotype or combination of genotypes of the initial variety."

In addition, we would suggest adding to Subparagraph (iii) the following language:

> Any otherwise protectable variety which does not express at least 90 percent of the essential characteristics of the initial variety, or from a variety that is predominately derived from the initial variety, not including the differences which result from the act of derivation, satisfies the requirements for minimum genetic distance such that it is not an essentially derived variety.
>
> Essential characteristics are defined as heritable, readily identifiable traits that contribute to economic value. Such traits may be qualitative or quantitative. Trivial or purely cosmetic traits which have no economic value are not considered essential characteristics.

These amendments provide the refinement of the UPOV definition of essentially derived needed to remove its inherent ambiguity. Our proposed amendments provide for more clarity of the rights of the owner of the initial variety and define succinctly the latitude that a second generation breeder has in making refinements in a protected variety and his ability to receive potential economic benefits for such efforts. Nevertheless, these amendments provide a substantial strengthening of the protection afforded to the initial breeder.

As currently drafted, S. 1406 could create difficulties for farmers desiring to have seed conditioned by a custom conditioner. In order to constitute a violation of the act, we believe a linkage needs to be established between conditioning of seed and direct knowledge of the intended use of the seed for propagation in violation of the act.

We would suggest that Section 8, Infringement of Plant Variety Protection, Subsection 7, be amended as follows:

> (7) condition the variety with knowledge that the variety is being conditioned for commercial seed sale or propagation for commercial seed sale.

Farm Bureau policy states that farmers should be able to save seed and sell incidental amounts of that saved seed. Neither the UPOV or S. 1406 allow that range of options. We would suggest that these important options can be maintained for farmers without creating problems for breeders of protected varieties. A balance of interests can be achieved by establishing a reasonable definition of incidental sales.

I should state from the outset that it is not Farm Bureau's intention to provide any protection to those individuals whose activities are clearly designed to compete with the sale of protected varieties. Farmers should be allowed to save an adequate amount of seed to plant their holdings twice. This allows for replanting in the event of failed germination.

If the farmer does not utilize the full amount of his saved seed on his holdings, he should be allowed to sell the remaining conditioned seed, since it is often not marketable as grain. A total prohibition on such sales could result in farmers having to try to store small quantities of treated seed for long periods of time and could lead to contamination of other grain and feed sources.

A total ban on sales could also create a situation in which farmers would have to destroy or dispose of such seed as hazardous

wastes. Either of these situations would create undue hardships for family farmers. In general, such sales would only produce extremely limited sales, generally between neighbors.

There may be other ways to define incidental sales, and we would consider those ideas. Farm Bureau does believe that the individual farmers we seek to protect through a "save and sell incidental amounts" provision are not the farmers who have benefited by the vagueness of the current farmer exemption. A balanced approach can end extensive "brown-bagging" while preserving farmer options.

Farmers who grow protected varieties of seed for breeders or seed companies should be protected in the event that the contracting party does not abide by the terms of the contract. Farm Bureau would support amendments to S. 1104 to allow a farmer to sell protected varieties according to local commercial law if the contract with the farmer is broken or delivery of seed under such contracts is refused.

The American Farm Bureau Federation supports amendments to the PVPA which are beneficial for all of U.S. agriculture. Some components of the UPOV treaty fall into that category and some do not. We hope the subcommittee and all the interested groups will, first, concentrate on workable amendments to the PVPA, and second, on how these amendments conform to UPOV.

I appreciate the opportunity to share the views of the Farm Bureau with you today and we look forward to working with you and others to improve PVPA.

Senator KERREY. Thank you very much, Mr. Neidig.

The next witness is Ms. Becky Winterboer, a farmer from Milford, Iowa.

STATEMENT OF BECKY WINTERBOER, FARMER, MILFORD, IA

Ms. WINTERBOER. Thank you, Mr. Chairman.

My name is Becky Winterboer. My husband Denny and I have been farmers in Clay County, Iowa for nearly two decades. Our experience with the Plant Variety Protection Act has been very real, very personal, and very painful, and that's why I'm here today to tell you how it affects the farmers individually and that it is so important to keep the farmers' exemption in the act and to allow certain farmers to save and to sell seed.

My husband and I own a small family farm, and for years, neighboring farmers would bring us their seed, their crops to clean for seed. We set up a small facility to clean our seed and our neighbors' seed, store it, and then return it to the neighbor for them to replant the next year.

Eventually, some of our neighbors asked us if we could just provide them with some of the seed from our harvest. This would save everyone a lot of time and trouble, and we simply cleaned our own seed and sold it to these same farmers. In this manner, we saved a lot of trouble and expense of delivering the seed back and forth.

Nevertheless, before we did this, we checked into the State laws and authorities and they told us that the PVPA did not prohibit seed sales to other farmers. We were assured that the farmers' exemption under the PVPA permitted farmers like us to sell seed to

other farmers, so long as we did not derive more than 50 percent of our income from these sales.

In 1989 and 1990, we cleaned the seed we harvested and sold it to farmers who had previously delivered their seed to us for cleaning. The price we charged essentially was the market price plus cleaning and storage. The farmers who bought our cleaned seed saved the cost of transporting their seed back and forth.

In 1991, we were sued by the Asgrow company, a division of the giant Upjohn Corporation, and what happened after that was just a virtual nightmare. After a brief hearing in the Federal District Court, the judge ruled that our sales violated the PVPA.

Our attorneys advised us that the judge was flat wrong, and we appealed to the Federal District Court here in Washington, DC, where a unanimous court stated that Denny and I did not violate the PVPA in making these sales. The Federal Court's ruling interpreted the intent of Congress and helped to clarify and preserve the right of the farmers to save and to sell seed.

Asgrow has now asked the United States Supreme Court to review this case.

I can't explain the emotional and financial cost this has been to my family, but there are a number of things that I have learned from this horrible experience and I would like the subcommittee to consider these carefully.

First of all, the PVPA, the protected varieties that are sold by the seed companies are variations and in sometimes exact varieties that are funded and developed at our State research centers. These research centers have been financed not only with public money but with an excise tax on farmers.

The UPOV Convention is not the only vehicle for seed companies to increase their breeders' rights. Many seed companies are now including a purchase agreement that has to be signed between the farmer and the seller that will not allow a farmer to use any of his seed for the next year's holdings. This means he has to buy new seed every single year. I'm sure this is the intent all along.

Granting seed companies a virtual monopoly on their registered seed will cause the seed prices to increase dramatically. In France, the seed costs are up to seven times greater than here in America.

Perhaps one of the most important things that I have learned is that allowing farmers to sell their saved seed will have no greater effect on the seed companies than it is now to allow them to merely save their own seed for replanting.

Mr. Chairman, Denny and I had to replant our crop four times this spring because of the Iowa floods. We have lost our entire corn crop. Because of a freeze last week, we have virtually lost our entire soybean crop also. We are not going to have enough seed to replant our own fields, and if the amendments will not allow us to buy it from our neighboring farmers, we will be forced to pay for the very expensive seed, and I don't know how we would be able to continue.

These are the things that I hope that you will consider on how it affects the smaller farmer. I am convinced that once all of the issues are considered carefully, that you will conclude that the centuries-old right of farmers to sell seed which they have grown to other farmers must be preserved.

The only thing that should be done is to clarify the language of the farmers' exemption so that farmers will not have to suffer what my husband and I have suffered. In my written statement I will submit for the record, I suggest language that does clear up these ambiguities while protecting the rights of certain farmers to sell a certain amount of their harvest as seed to other farmers.

Thank you for listening. I would be pleased to respond to any questions you have.

Senator KERREY. Thank you, Ms. Winterboer. Your full statement will be made a part of the record.

Ms. WINTERBOER. Thank you.

[The prepared statement of Ms. Winterboer follows:]

PREPARED STATEMENT OF BECKY WINTERBOER, FARMER, MILFORD, IA

Mr. Chairman and members of the subcommittee: my name is Becky Winterboer and my husband, Denny, and I have been farmers in Clay County, Iowa for nearly two decades.

My experience under the Plant Variety Protection Act is real, personal, and painful and I am here today to tell you why it is so important to keep the farmers' exemption in the act to allow certain farmers to save and sell seed.

My husband and I own a small family farm and for years neighboring farmers would deliver to us a portion of their crops for cleaning at our farm. We set up a small seed cleaning facility and for a charge of $1 per bushel we would clean our neighbors' seed, store it, and then return it to the neighbor who would plant it the next season.

Some of our neighbors asked us if we could provide them with cleaned seed from our harvest. This would save everybody a lot of time and trouble if we simply cleaned our own seed and sold it to these same farmers. In this manner, we and they saved the trouble and expense of delivering the seed back and forth.

Nevertheless, before doing this we checked with the State authorities. We were told that the PVPA did not prohibit seed sales to other farmers. We were assured that the farmers' exemption under the PVPA permitted farmers like us to sell seed to other farmers, so long as we did not derive more than 50 percent of our income from these sales.

In 1989 and 1990, we cleaned the seed we harvested and sold it to farmers who previously had delivered their seed to us for cleaning. The price we charged was essentially the market price of the crop plus cleaning and storage charges. The farmers who bought our cleaned seed saved the cost of transporting their seed back and forth.

Then, in 1991 we were sued by the Asgrow Company, a subsidiary of the giant Upjohn Company. Asgrow sent one of their agents specifically to buy seed from us to set us up for litigation that would test the strength of the farmers' exemption in the PVPA. What happened afterwards was a nightmare. After a brief hearing in the Federal District Court, the judge ruled that our sales violated the PVPA. Our attorneys advised us that the judge was flat wrong. We appealed to the Federal Circuit Court here in Washington, DC, where a unanimous court stated that Denny and I did not violate the PVPA in making these sales. The Federal Circuit's ruling interpreted the intent of Congress and helped to clarify and preserve the right of certain farmers to save and sell a portion of their harvest as seed. In the meantime, Asgrow Seed Company was issuing press releases saying that we had violated the law, and implying that they would continue to sue farmers who either sold or bought brownbag seed.

Asgrow has now asked the United States Supreme Court to review this case. I can't really explain the emotional and financial costs we suffered to defend this suit. I guess we could have settled early-on—just as Asgrow had hoped we would. Indeed, we later came across an article by Asgrow's attorneys urging other seed companies to sue farmers who were "brown baggers," knowing that most family farmers can't afford litigation. Asgrow said the suits would cause these farmers "headaches" and cause them to settle right away. But we knew we were in the right; we just could not let the seed companies get away with these tactics.

There are a number of things I learned during this horrible experience that I believe this subcommittee should consider:

1. The PVPA protected varieties sold by the seed companies are insignificant variations or the exact variety of seed developed in State research centers using public funding. These centers have also been financed by an excise tax on farmers!
2. In a book entitled "Altered Harvest" it is pointed out that Virginia Knauer, President Nixon's Special Assistant for Consumer Affairs, recommended in 1970 that President Nixon veto the PVPA. She said there was no evidence that the seed companies needed the protection given by the act. She added that the most likely results would be increased prices to consumers, increased taxes to taxpayers, and increased revenues to plant breeders.
3. There is still no evidence that seed companies need any more protection than that given by the PVPA. Their whole case seems to be the statement that Pioneer discontinued selling one variety of wheat. What the seed companies don't tell us is that the variety Pioneer discontinued had been on the market for many years and had been replaced by new and better varieties. With or without brownbag sales, Pioneer would probably have discontinued that variety of wheat. In addition, the seed companies omit the fact that 30 new companies have entered the seed market in the last 10 years—despite the farmers' exemption—and the industry has been enormously profitable.
4. Granting seed companies a virtual monopoly on their registered varieties will cause seed prices to go through the roof. In Europe, where farmers are denied the right to replant seeds and sell them to other farmers, seed costs up to seven times what it costs American farmers.
5. Granting seed companies a monopoly will give them windfall profits on the varieties that they now license from State agencies. Seed companies have paid a modest royalty on these seeds; when they can double the price of the seed to the American farmer and consumer, they will realize profits never bargained for when they licensed the variety from State agencies.
6. Granting seed companies a monopoly on protected varieties will inevitably lead to a restriction on seed varieties and a decrease in biodiversity. Many seed geneticists have expressed their deep concern that this could threaten our Nation's food supply if a dominant variety becomes susceptible to a virus or disease.
7. And perhaps most important, allowing farmers to sell their saved seed will have no greater impact on seed companies than allowing farmers to save their own seed for replanting.

Mr. Chairman and members of the subcommittee, Denny and I lost our entire corn crop this year because of flooding in Iowa. Just days ago we also lost most of our remaining soy bean crop because of the early frost. I do not know where we will find money to buy seed for next year. I do know if seed costs a multiple of what it does now, and we can't buy seed from other farmers, our situation will be hopeless. Yet, this is what we can expect if Senator Kerrey's proposed amendments to the PVPA are passed by Congress.

I am convinced if this subcommittee carefully considers all of the issues, it will conclude that the centuries-old right of farmers to sell seed which they grow to other farmers must be preserved. The only thing that should be done is to clarify the language of the farmers' exemption so that other farmers will not have to suffer what my husband and I have suffered.

Thank you for listening. I would be pleased to respond to any questions you may have.

Senator KERREY. The next and last witness is Ms. Hope Shand, Research Director for the Rural Advancement Foundation International, Pittsboro, North Carolina.

STATEMENT OF HOPE J. SHAND, RESEARCH DIRECTOR, RURAL ADVANCEMENT FOUNDATION INTERNATIONAL, PITTSBORO, NC

Ms. SHAND. Thank you, Mr. Chairman.

My name is Hope Shand. I represent the Rural Advancement Foundation International, based in Pittsboro, North Carolina. We are a private, nonprofit organization and we work on the problem of the loss of genetic diversity in agriculture. We are increasingly concerned about the impact of plant intellectual property rights on U.S. agriculture and world food security.

On the surface, amendments to the Plant Variety Protection Act may appear quite innocuous, but there is more to this issue than meets the eye. Proposed amendments to the U.S. Plant Variety Protection Act have implications far beyond our borders. There is a great deal of uncertainty, as well as conflict, about the potential impacts of both plant breeders' rights and utility plant patenting.

We believe that the newly revised UPOV treaty substantially strengthens the rights of plant breeders at the expense of farmers. Our concerns are further outlined in my written testimony, so I will limit my remarks to just a few issues today.

The first is the international controversy over control and ownership of plant genetic resources and how that might jeopardize future access to and exchange of crop genetic resources. All major food crops, the crops that feed the majority of the world's population, have their origins and centers of diversity in the tropics and subtropics of the developing world. Erosion of crop genetic diversity threatens the stability of our food supply.

This is because the diversity that is found in developing countries is vital for the maintenance and improvement of new crop varieties. The high yielding, elite cultivars of U.S. agriculture depend on a steady stream of new exotic germplasm.

The United Nations Food and Agriculture Organization estimates that since the beginning of this century, about 75 percent of the genetic diversity of agricultural crops has been lost.

Unfortunately, in the rush to promote exclusive mechanisms for rewarding plant breeders and developers of new agricultural biotechnologies, there has been little or no consideration for the impact of intellectual property rights on the future conservation and exchange of biological resources. The danger is that intellectual property rights without reciprocal benefits or meaningful compensation for developing nations could set up formidable barriers to access to the world's genetic resources.

In the wake of new plant patenting proposals and strengthening of breeders' rights, developing nations are questioning the notion of full and free access to their biological resources. They are asking, why is it that patented seeds, ultimately of Third World origin, are bringing profits to seed corporations without corresponding compensation for the developing world and their farmers?

Although we hear little about this controversy in the United States, the issue is extremely controversial in the developing world. Consider, for example, the recent actions of over 1,000 angry farmers who ransacked a local Cargill office in Bangalore, India to protest plant intellectual property rights currently under negotiation at the GATT talks in Geneva. These farmers are angry because they don't want to pay royalties on seeds and other biological products that they believed were developed using their own genetic resources and knowledge.

We believe that international tension over ownership and control of genetic resources will intensify if the United States ratifies an international treaty that does not guarantee the right of farmers to save seed. Again, the danger is that developing nations will restrict future access to genetic resources, the cornerstone of modern plant breeding and genetic engineering.

We also believe that the PVPA and other forms of plant intellectual property rights will unintentionally encourage and exacerbate problems of crop genetic erosion in the Third World. In recent history, the single greatest cause of crop genetic erosion in Third World centers of diversity has been the introduction of new uniform cultivars, commercial varieties, that replace farmers' traditional varieties. The strengthening of plant breeders' rights internationally will further accelerate genetic erosion in Third World centers of diversity.

We also oppose the extension of proprietary protection to harvested materials. End-product protection would give a seed company the legal right, for example, to prevent food aid shipments that may contain protected seed from going to a Third World country that does not recognize plant breeders' rights.

This is a particularly dramatic example, I am aware of that, but this measure will compel many developing countries to adopt plant breeders' rights that may be entirely inappropriate for their level of development or for their needs. We believe that extension of breeders' rights legislation in developing nations is likely to contribute to genetic erosion, and again, it may jeopardize future conservation and exchange of these vital resources.

In conclusion, RAFI urges Members of Congress to reexamine the PVPA within a broader context and to carefully consider the social and economic implications of plant breeders' rights and other forms of intellectual property rights on farmers, plant breeding and germplasm activities, and future access to and exchange of plant genetic resources, both domestically and internationally.

We urge Congress to preserve the farmers' exemption. We do not support illegal brown-bagging of proprietary seed, and we acknowledge that there have been some abuses. However, current trends in life patenting, the extension of intellectual property rights to plants, animals, genes, and other biological products will ultimately diminish the U.S. farmer's role to little more than a renter of germplasm, a new class of sharecropper, if you will.

We believe that there is a fundamental difference when you are talking about intellectual property protection for books and light bulbs and mouse traps than there is for food and food products.

No action should be taken to eliminate the farmer's right to save proprietary seed for replanting on his or her own holdings or to sell limited quantities of seed to his or her neighbor.

Finally, we believe that the U.S. should decline to ratify the 1991 UPOV treaty pending further study and a comprehensive policy review.

Thank you very much.

[The prepared statement of Ms. Shand follows:]

PREPARED STATEMENT OF HOPE SHAND, RESEARCH DIRECTOR, RURAL ADVANCEMENT FOUNDATION INTERNATIONAL, PITTSBORO, NC

My name is Hope Shand. I am Research Director of the Rural Advancement Foundation International-USA (RAFI), based in Pittsboro, North Carolina. RAFI is a private, nonprofit organization that is dedicated to the preservation of family farms, the conservation and sustainable use of agricultural biodiversity, and the socially responsible use of new technologies. RAFI has a long history of work on the problem of the loss of genetic diversity in agriculture, and we are increasingly con-

cerned about the impact of plant intellectual property rights on U.S. agriculture and world food security.

The Plant Variety Protection Act (PVPA) is the U.S. version of patentlike laws that are known internationally as "plant breeders' rights." As an alternative to the industrial patent system, the PVPA was established to provide breeders with limited monopoly rights over the production, marketing and sale of new, sexually reproduced plant varieties (such as soybeans, wheat, cotton and canola) for 18 years.

Proposed amendments to the PVPA would make the U.S. law conform with plant breeders' rights laws internationally, coordinated by the Union for the Protection of New Varieties of Plants (UPOV) headquartered in Geneva. The UPOV treaty governs the rules for granting of plant breeders' rights internationally, offering reciprocal protection for member states.

RAFI believes that the newly revised UPOV treaty (which the United States has signed, but not ratified), substantially strengthens the rights of plant breeders, at the expense of farmers. We question the need to amend the PVPA to conform with the 1991 UPOV treaty, and we urge Members of Congress to consider the broader social and economic impacts of plant intellectual property rights on farmers, the future of U.S. agriculture and world food security. RAFI's specific concerns are outlined below.

CONCERNS

The Farmer's Right

What was once viewed as the farmer's inalienable right—the 10,000-year-old ritual of saving seed from a harvested crop—is now jeopardized by plant patenting laws at the national and international levels.

The "farmer's exemption" or "farmer's right" has always been a prominent feature of the PVPA. The fundamental right of the farmer to save his/her patented seed for replanting (or for resale, if the farmer is not principally in the business of reselling protected varieties), was so important that, when hearings on the PVPA were first held in 1970, the assurance of this right was part of the bargain made to gain passage of the legislation.

But times have changed. For one thing, there has been tremendous consolidation in the U.S. seed industry. Plant breeding and seed sales are now dominated by multinational pharmaceutical and chemical corporations. These companies now refer to the farmer's right to save seed and sell limited quantities of proprietary seed as the farmer's *privilege*—a privilege they seek to revoke through legislative and judicial means.

Proposed amendments to the PVPA seek to eliminate the farmer's right to sell limited quantities of proprietary seed to his or her neighbor. RAFI asks: How long will it be before farmers lose the right to save proprietary seed for planting on their own farm?

RAFI does not support illegal brown-bagging of proprietary seed. We acknowledge that some segments of the seed industry (in niche markets) have suffered as a result of *illegal* brown-bagging. However, we feel that the proposed amendments are too restrictive in dealing with the problem.

RAFI believes that attempts to restrict the farmer's exemption under PVPA will take us one step closer to total elimination of the farmer's right to save seed. The seed industry acknowledges that it is both the practice of brown-bagging proprietary seeds, as well as farmers saving their seed for replanting on their own holdings, that erodes seed industry sales. If it becomes illegal for farmers to sell proprietary seed to their neighbor, will the seed industry return to Congress a year or two from now to argue that the real infringement is due to farmers saving their own seed for replanting?

It is important to point out that the newly revised UPOV treaty makes it *optional* for member countries to allow farmers to save seed for planting on their own holdings. If the U.S. Congress ratifies the new UPOV treaty we believe that this option leaves the door wide open for a future ban on all farm-saved seed.

Why Are We Letting an International Treaty Define the U.S. Farmer's Right To Save and To Sell Limited Quantities of Seed from Their Harvest?

The seed industry argues that the U.S. Congress has a "moral obligation" to amend the PVPA so that it conforms with the new UPOV treaty. This is because the U.S. negotiating team in Geneva worked very hard to draft the new treaty. It is important to point out that the U.S. negotiating team at UPOV consisted of seed industry and U.S. Government representatives. It did *not* include U.S. farmers, and it certainly did not include farmers who exercise their legal right to sell limited quantities of seed to their neighbors. If the U.S. Congress has a "moral obligation,"

in regard to this issue, we believe it is to carefully review the original intent of Congress in preserving and protecting the farmer's right to save seed and to sell limited quantities to his or her neighbor.

Will U.S. Failure to Ratify the 1991 UPOV Treaty Make the U.S. Seed Industry Less Competitive In the World Market?

While proponents of S. 1406 argue that it is necessary for the U.S. to conform to the newly revised UPOV treaty, it is important to note that *no other nation* has ratified the 1991 treaty to date. In addition, the United States will suffer no penalties by declining to adhere to the 1991 UPOV treaty. If the United States declines to become a party to the new convention, it will continue as a member of UPOV adhering to the provisions of the 1978 convention. According to Rob Robinson of the American Seed Trade Association's Intellectual Property Rights Committee, in the event that the United States does not become a party to the new UPOV convention, U.S. breeders would not benefit from the stronger breeders' rights contained in the new convention within the United States, but they would qualify for these rights in any other UPOV member country which is a party to the new convention.

International Controversy Over Control and Ownership of Plant Genetic Resources Could Jeopardize Future Access to and Exchange of Crop Genetic Resources

All major food crops, the staple crops grown and consumed by the vast majority of the world's population, have their origins and centers of diversity in the tropics and subtropics of the developing world.

The subject of crop genetic diversity assumes utmost urgency today because we are losing biological resources at an unprecedented rate. The Food and Agriculture Organization of the United Nations estimates that, since the beginning of this century, about 75 percent of the genetic diversity of agricultural crops has been lost.

Erosion of crop genetic diversity (the loss of genetic diversity through extinction) threatens the existence and stability of our food supply. This is because the diversity found in developing countries is vital for the maintenance and improvement of new crop varieties. To maintain pest and disease resistance in our major food crops, for instance, or to develop other needed traits like drought tolerance or improved flavor, plant breeders constantly require fresh infusions of genes from the farms, forests and fields of the developing world. The high yielding, elite cultivars of modern agriculture depend on a steady stream of new, exotic germplasm. *The U.S. Government estimates that a 1-percent gain in crop productivity due to the use of introduced germplasm means a $1 billion dollar benefit to the American economy.*

In the rush to promote exclusive mechanisms for rewarding plant breeders and developers of new agricultural biotechnologies, there has been little or no consideration for the impact of intellectual property rights on the future conservation and exchange of biological resources.

The danger is that intellectual property rights, without reciprocal benefits and meaningful compensation for developing nations, could set up formidable barriers to access to the world's genetic resources. In the wake of new plant patenting proposals, and strengthening of breeders' rights, developing nations are questioning the notion of full and free access to their biological resources. Why, they ask, are patented seeds, ultimately of Third World origin, bringing profits to multinational seed corporations without corresponding compensation for the developing world?

Although we hear little about this controversy in the United States, the issue is extremely controversial in the developing world. Consider, for example, the recent actions of over 1,000 angry farmers who ransacked a local Cargill office in Bangalore, India to protest plant intellectual property rights currently under negotiation at the General Agreement on Tariffs and Trade (GATT) in Geneva. These farmers are angry because they don't want to pay royalties on seeds and other products that they believe were developed using their own genetic resources and knowledge.

International tension over ownership and control of genetic resources will intensify if the United States ratifies an international treaty that does not guarantee the right of farmers to save seed. Again, the danger is that developing nations will restrict future access to genetic resources, the cornerstone of modern plant breeding.

The PVPA and Other Forms of Plant Intellectual Property Rights Will Unintentionally Encourage and Exacerbate Problems of Crop Genetic Erosion

Genetic erosion is an unintended consequence of modern plant breeding. To the extent that a seed company produces a successful variety, it can displace genetic material needed for future breeding programs. Historically, the single greatest cause of crop genetic erosion in Third World centers of diversity has been the introduction of new, uniform cultivars that replace farmers' traditional varieties. The strengthening of plant breeders' rights internationally, and the promotion of plant

breeders' rights in developing nations, will further accelerate genetic erosion in Third World centers of diversity.

While the seed industry has been reluctant to admit the connection between plant breeders' rights and the loss of genetic diversity, the Keystone Dialogue on Plant Genetic Resources (which included seed industry representatives), made blunt criticisms of plant breeders' rights in this regard:

> At the level of individual plant species of agronomic value, current intellectual property rights systems reinforce the tendency of plant breeding to decrease genetic diversity. These systems encourage the production and dissemination of new varieties which often replace the more diverse landraces and local crops * * * commercial research tends to focus on a limited number of crops with large acreage or with a high profitability of seed sales. Moreover, the existing uniformity requirement to obtain Plant Breeders' Rights ensure a high degree of genetic uniformity within a variety. The protected uniform variety * * * has the potential to displace more genetically diverse landraces. (The Keystone International Dialogue Series of Plant Genetic Resources, 1991:14.)

The Implications of Extending Proprietary Protection to Harvested Materials

One of the proposed changes embodied in S. 1406 would extend proprietary protection to *harvested materials* of protected varieties. This means, for example, that grain grown from protected seed, or any other end product that is produced from proprietary seed, would be protected by the PVPA. This gives the corporate breeder the power to restrict imports and exports of protected varieties and their products if that product is produced using seed without authorization. Seed companies could, for example, restrict imports into a UPOV-governed country of farm products coming from countries that do not recognize breeders' rights. End-product protection would also give a seed company the legal right to prevent food aid shipments that may contain protected seed from going to a Third World country that does not recognize plant breeders' rights.

We urge Members of Congress to examine closely the broader implications and potentially negative impacts of such a change. The seed industry favors the extension of PVPA protection to harvested materials (under UPOV) because this measure would compel many developing nations to adopt plant breeders' rights.

Historically, UPOV's member states do include developing nations. In reality, few Third World countries have the infrastructure to enforce breeders' rights and other forms of plant intellectual property rights. Given the threat of trade retaliation, however, Third World nations are now under tremendous pressure to adopt plant breeders' rights. At the General Agreement on Tariffs and Trade (GATT) negotiations in Geneva, for instance, proposals put forth by the United States and other industrialized countries place extraordinary pressure on developing nations to adopt plant breeders' rights as a minimum system of patent protection. As noted above, extension of breeders' rights legislation in developing nations is likely to contribute to crop genetic erosion. It may also jeopardize future conservation and exchange of plant genetic resources.

Conclusion

Thank you for the opportunity to appear before this subcommittee. We hope that you will use this hearing as a reference point for further debate and discussion on this issue, prior to taking further action on S. 1406.

Proposed amendments to the U.S. Plant Variety Protection Act have implications far beyond our borders. What may, at first glance, appear to be an innocuous issue, is extraordinarily complex and controversial. There is a great deal of uncertainty, as well as conflict, regarding the potential impacts of both plant breeders' rights and plant patenting. In addition, new genetic technologies are being developed much faster than society can develop socially responsible policies to assimilate them.

RAFI urges Members of Congress to reexamine the Plant Variety Protection Act within a broader context, and to carefully consider the social and economic implications of plant intellectual property rights for farmers, plant breeding and germplasm activities, and future access to and exchange of plant genetic resources, both domestically and internationally.

A review of the 23-year history of the Plant Variety Protection Act reveals that the act itself and later amendments were enacted into law without ever experiencing a recorded vote. The intent of Congress in passing the Plant Variety Protection Act was "to promote progress in agriculture in the public interest." As custodians of the public interest, we urge Congress to conduct a comprehensive policy review of

all forms of intellectual property rights affecting agriculture, including plants, animals and other life forms.

Specifically, RAFI recommends:

• Preserve the farmer's exemption. No action should be taken to eliminate the farmer's right to save proprietary seed for replanting on his/her own holdings or to sell *limited* quantities of seed to his/her neighbor.

• The U.S. should decline to ratify the 1991 UPOV treaty, pending further study and a comprehensive policy review.

Senator KERREY. Thank you, Ms. Shand.

I would like to see if I could generate a discussion in the time that we have remaining here. Mr. Schmidt, if I might start with you, do you know what the total world market is for seeds and what the U.S. share is of that world market?

Mr. SCHMIDT. I do not have the exact figures, unless one of our colleagues has it in front of him, but the United States has a majority of the market.

Senator KERREY. And what are the trends, Mr. Schmidt?

Mr. SCHMIDT. The trend has been up for the United States.

Senator KERREY. Increased market share worldwide?

Mr. SCHMIDT. Yes, because of the development of new varieties that are very strong in the United States, but we do not have the security or the protection here in the United States as we now experience in Europe. The Europeans have a much stronger Plant Variety Protection Act, and many companies have actually gone to Europe to breed and protect their varieties over there and those are not available in this country.

A good example is certainly the company Pioneer, who have discontinued their breeding work on the Hard Red Winter wheat and Spring wheat and that is now being done in Europe and it is not available over here.

Senator KERREY. I would appreciate it if we could have a small discussion of the statement that Ms. Shand just made that seemed to imply that perhaps Third World nations are at risk if we ratify this treaty. My own sense of this is that Third World nations have benefited as a consequence of development of seed. I don't quite understand the statement.

Perhaps, Ms. Shand, you could respond to my question and then we could have some discussion.

Ms. SHAND. I will say that as far as I understand, no other country has yet ratified the 1991 UPOV treaty. I may be mistaken, but the last time I asked about this that was my understanding.

I think that, again, it is important to look at this issue in a broader context. At GATT, for instance, the minimum level of protection for plants that is being proposed by industrialized countries and the United States is the plant breeders' rights. Historically, developing countries have declined to have plant breeders' rights in their own countries. Now, under the threat of trade sanctions, they may have little choice in the matter.

But I think that it needs to be recognized that this is a major subject at the GATT and in other international forums besides determining what the United States does.

Senator KERREY. First of all, Dr. Clayton, would you give us the status of this? Has the administration sent the treaty to be ratified?

Mr. HOINKES. No, Mr. Chairman. Generally, before the administration would ask the advice and consent of the Senate to ratification it is the practice that implementing legislation would either be passed or well advanced towards passage, because these treaties are not self-executing. So in order to be able to incur the treaty obligations that ratification implies or carries with it, implementing legislation would have to be passed.

As a consequence, the first step in the ratification process of treaties of this nature would be the introduction and hopefully enactment of implementing legislation. This is what we are doing here.

Senator KERREY. Do you know the current status of ratification by other countries? Have any countries ratified of the 16 that have signed the treaty?

Mr. HOINKES. It is my understanding, Mr. Chairman, that no country at this point has ratified the convention.

In Europe, for instance, that is largely due to the fact that the European Economic Community also has under consideration a regulation on community plant variety rights that may have been finalized by now, and that is supposed to go hand-in-hand with UPOV. What these countries want to do is to adopt their laws so that they would be consistent both with the European Community plant variety rights regulation and with UPOV. So it is just a matter of time until the EC would fall into place as far as adoption of the UPOV Convention is concerned.

Other countries are, we have been told, well under way, either in also drafting legislation, or already having submitted legislation to their respective parliaments, but as of this date we are not aware that any country has ratified. But this is just a matter of time.

Senator KERREY. Mr. Latham, did you want to make some comments?

Mr. LATHAM. Mr. Chairman, in the summer of 1991, I had the opportunity to travel to China on behalf of the Iowa and Illinois Soybean Promotion Boards, the check-off boards, accompanied by individuals from the ag experiment stations at Iowa State University and the University of Illinois for the expressed purpose of trying to acquire soybean germplasm from China that has up until this time been unavailable to us, even though USDA and others, including ourselves, had made extensive efforts to do that.

The entire rest of the world, at least the estimates we were given, the entire rest of the world in total germplasm collections has about 11,000 accessions of soybeans. I am not calling them varieties, but accessions of soybeans. The Chinese, by their own estimates, have about 22,000 accessions, of which 17,000 are the glycine max or the commercial or commonly cultivated cultivars, and about 5,000 are the glycine soya, or the wild soybeans. U.S. scientists believe that we may have the best opportunity for genetic diversity in the wild soybeans.

The Chinese invited us to come. They want to work with us and we are working with them to acquire some of the germplasm that will come to the U.S. germplasm collection, the repository in Illinois, and USDA's collection, and we are continuing that relationship.

The big Chinese concern is that if we can't get some of the—they don't have the resources to collect and put in their own germ bank and they are worried about some of those accessions being lost forever unless we have the resources to collect and put them in the U.S. collection and the Chinese collection collaboratively.

The problem is, they don't have the resources and they are reluctant to give up their national treasure of soybeans because of the intellectual property rights issue. They want to be assured of the opportunity for intellectual protection or property protection of the germplasm collection.

Senator KERREY. Perhaps the number one question in dealing with this piece of legislation and the ratification of the treaty is the economic urgency to do so, and that is why I was asking the questions: what is the total world market; what is the U.S. share; what is the trend; and what is at stake.

Mr. Schmidt, there is an OTA report from 1989 that I assume you have some knowledge of that stated that the impact of the 1970 PVPA was unclear, that the direct stimulation of private investment was approximately that of the preceding 10 years, and that increases in private development of varieties have been limited to a few major crops, that being soybeans and wheat.

The original intent of PVPA was to make more varieties available, and I am trying to ascertain whether or not that was the case and what the economic urgency is in ratification of this treaty.

Mr. SCHMIDT. It is certainly clear—Rob, did you want to respond?

Mr. ROBINSON. I think there is one case in point, and that is the case of Hard Red Winter wheat, that may be the greatest example.

In the Great Plains, private Hard Red Winter wheat breeding in the last 10 years has dwindled drastically, part of it being Pioneer leaving Hard Red Winter breeding in the United States, but also a number of other private programs have disappeared as well. I believe the numbers have dwindled in the last 10 years from something like 25 programs down to 4 or 5 programs left in private breeding of Hard Red Winter wheat.

So I think the economic urgency is not only on the part of the seed companies, but I think it is on the part of those people who benefit from those varieties that are produced. Once a breeding program is discontinued, it is at least 10 years until a new program is viable and producing new varieties. So once we lose these programs, to start them again takes a long period of time. I just don't think we can afford to continue to see these programs disappear, either for the seed industry or the agriculture at large.

We have similar examples in cotton, and maybe somewhat less in soybeans. Cotton and wheat, in particular, seem to be the hardest hit.

Senator KERREY. Dr. Watson.

Dr. WATSON. Mr. Chairman, if I could comment on the economic impact based strictly on certification, the 25-percent decrease in acres certified that we have seen in the last 12 years amounts to a million acres in the 42 member states that we have. Based on our best economic estimates, if we use a low-value crop, this is a loss to our certified seed growers of $200 million a year. If we use the higher-value crop, it approaches $1 billion a year. So it is very sig-

nificant to these growers and certainly one that merits being addressed by the Congress.

Senator KERREY. Ms. Shand.

Ms. SHAND. Yes, Mr. Chairman, I am aware of the example that is often cited of Pioneer pulling out of breeding research on Hard Red Winter wheat, and to me, this really underscores the importance of public plant breeding programs. I just want to amplify the earlier remarks of Dr. Barnes on the importance of continued public sector plant breeding efforts. I think it is a terrible thing to be threatened with the loss of breeding programs, but to me, this as much as anything talks about the urgency of resurrecting public plant breeding efforts.

Senator KERREY. Dr. Clayton, how much do we spend on public breeding research?

Dr. CLAYTON. Mr. Chairman, I can provide you the specific numbers, but I believe that the Department of Agriculture spends on the order of $50 to $60 million a year on germplasm cataloging and breeding research related thereto.

Senator KERREY. Has the amount and focus changed since the PVPA was first enacted?

Dr. CLAYTON. We probably would want to confirm this for you, Mr. Chairman. Our belief is that there probably has been some shift toward germplasm preservation away from breeding, but we would want to confirm that to you.

Senator KERREY. My understanding is that the idea was that the public research would focus after PVPA upon minor crops and basic research, and I would hope that since 1970 that the shift occurred, that, in fact, that is what we have been doing.

Dr. CLAYTON. I believe that is the case. I believe that is what the budget data would indicate.

Senator KERREY. Are you asking for more than that, Ms. Shand?

Ms. SHAND. I would be very interested in knowing. I think it is an issue of great concern. I don't want to see the American farmer left at the mercy of Pioneer Hybrid. Pioneer Hybrid is the largest seed corporation in the world. If they pull out of plant breeding in a specific niche market, that is a problem. But I would hope that if it is an important crop or a minor crop that we would have some public plant breeding efforts to reinforce the lack of commercial breeding.

And I would also say that I have heard that example cited over and over. It is very difficult for those of us who have raised questions and concerns about eliminations of the farmer's right to know to what extent and what difficulties the seed industry is experiencing, other than these often-cited examples, but we really have no hard figure on this, and I don't know if they are available or not.

Senator KERREY. Certainly you are not objecting to providing protection to someone who develops a variety of seed and sells it on the market.

Ms. SHAND. No, I am not.

Senator KERREY. Yes, Ms. Winterboer?

Ms. WINTERBOER. Mr. Chairman, I just wanted to elaborate a little bit more on the example of Pioneer wheat. They did testify at our hearing, and Michael Roth, who is their patent attorney, stated that they were making 10- to 12-percent profit on their wheat when

they decided to drop it. And please do keep in mind that they are the number one seed producer and income holder of seed.

Senator KERREY. Mr. Robinson.

Mr. ROBINSON. I may just mention that the representation of ASTA is a broad base of some larger companies, some medium-sized regional companies, and some smaller companies, a number of whom, the regionals and smaller companies, doing quite a bit of research, product development research. They are at risk just as Pioneer is at risk in this situation. It is not just large corporations, it is local and regional corporations as well.

Senator KERREY. Sir, did you want to respond?

Mr. NEWLIN. Yes, I would like to respond to Ms. Winterboer's comment.

Senator KERREY. Would you identify yourself?

Mr. NEWLIN. My name is Owen Newlin. I am the retired senior vice president of Pioneer Hybrid. I am a member of the board of directors. We were not making any money on Hard Red Winter wheat before we discontinued it. I don't know what that testimony is. We broke even on one year in the previous years but we lost money in all the years prior to that. We were selling by survey 91 percent of the wheat in Kansas with Variety 2157, but in fact, we were only selling nine-tenths of 1 percent because the rest of it was going brown bag, and that is essentially the reason we got out, because we could not get a return on our research investment.

Ms. WINTERBOER. I apologize if that was taken wrong, but it was in print from Michael Roth that they were making that percent. I would also like to note that it is not necessarily the brown-bagging that stopped Pioneer from selling seed, it is the fact that farmers can save their own seed and replant it, which is the traditional and the majority of the way farmers run their business. So in effect, this would not have helped Pioneer at all, even if there wasn't any brown-bagging.

Mr. NEWLIN. It was the brown-bagging plus the selling to other people from their own holdings.

Ms. WINTERBOER. Correct, but it is hard to distinguish one from the other. For another example, once we stopped doing any brown-bag sales, the amount that we cleaned for farmers increased three times.

Senator KERREY. Yes?

Dr. CLAYTON. Mr. Chairman, we have a shared interest in investment, in the proper research and development that adds value to basic germplasm that is out there. Whether it is something that we have in our own possession or some exotic germplasm that might be available from another country, the issue is stimulating investment to add value to that germplasm.

The issue is what actions might we take which would stimulate that investment. Certainly there are two ways to go, and they are not mutually exclusive in the sense that there can certainly be private sector investment. There also can be public sector investment.

I guess the point I have particularly been struggling with is in terms of the saved seed exemption and trying to determine in my own mind what effect that has on investment, adding value to basic germplasm so that we get new and improved varieties of seeds. It does seem a bit difficult to sort out how, in fact, the saved

seed exemption bears in any particular positive way on stimulating added investment, added research and development to give us a wider range of varieties, improved varieties, that sort of thing.

Public investment is an appropriate issue for debate. I am not sure that it specifically relates to the possible amendments to the Plant Variety Protection Act. PVPA clearly has principal focus, at least, on the issue of private investment and what kinds of actions Government might take in creating an environment for that investment to create that value added. Public investment may be dealt with in other forums within the Congress and elsewhere.

Senator KERREY. I do think, Dr. Clayton, that one of the things we have to establish for people who are paying for this is what is the public role and what is the private role. I think that is a crucial debate, and the decision has to be made.

I think it is being assumed that there is a private role and that the public is going to essentially identify those specialty crops or new crops and do a lot of new basic research. I hope, in fact, that is what has happened over the last 20 years. We are assuming that it is the case and we need to know if it is.

One of the things, I guess of all of the things coming out of the hearing, that concerns me is that when you are dealing with an issue like this where it hardly reaches onto the normal radar screen of a Member of Congress, there must be a compelling need to ratify the treaty. We have to have an economic argument. The incidental sale issue, it seems to me, we can resolve. The issue of what can the farmer retain and what can't they retain is something that can be resolved.

But unless we make a compelling economic argument that there is a need both from the standpoint of maintaining our value-added competitive edge for the production of seed, the breeders, as well as the value-added competitive edge from people who are growing crops, that this is an issue that is apt to flounder and not go anywhere.

In the time remaining, I would appreciate—because it seems to me that the testimony you provided gave much more of an academic argument than it was an economic argument, unless I just missed the overall thrust. Perhaps Mr. Latham and Mr. Robinson, who have economic stakes in this thing, could bring a bit of the economic argument.

Mr. ROBINSON. I think, again, if we look at the economic side, you have two sides to it. One would be economics on the part of the seed company and the other side is economics on the part of U.S. agriculture.

Certainly if you look at U.S. agriculture first, U.S. farmers in terms of land costs and certain other inputs aren't at an economic advantage compared to other countries, other producing countries. One thing that makes them so competitive and a world leader in this respect is the yields that they are able to achieve. The cornerstones of that high level of productivity is new and improved plant varieties.

I think an economic argument that we certainly have to look at is the erosion of U.S. agricultural exports due to fewer and fewer plant varieties being available.

I think on the other side, in terms of the economic argument from the seed companies' point of view, I think that one side of that would be to look at the loss of breeding programs due to an inability to finance them. I don't have figures today how to quantify that in all the crops represented.

Dietrich, would you have anything to add to that?

Mr. SCHMIDT. I would clearly state here that it is very important for the U.S. farmers to have superior varieties which give them increased yields and therefore they can go to the world markets and sell that product, the commodity product, at a price that many others cannot compete, and this is the fact to this date and we want to maintain that. That is the important thing. U.S. export of agriculture products is still a very important part of our export trade and balance of payments.

From the seed companies' point of view, there is no question in my mind that if I invest $1 million or whatever that might be, I need to have a return for that investment. It can be clearly demonstrated that the investments we are making today are very significant in order to remain competitive worldwide, and the seed companies are certainly doing that.

From the point of public research, there has been a lot of public research done over the past years, but over the past 10, 15, or 20 years, we have seen this eroding as far as coming out with varieties that can be commercialized, simply because the public research funding has dried up or has been shifted, as you stated, to more basic research or new things. The public is now responsible almost to come up with new varieties and to improve those.

Furthermore, I would like to say one other thing about the diversity of germplasm. The diversity of germplasm is still available, because we do have a research exemption, and that germplasm can be available to anyone worldwide.

Thank you.

Senator KERREY. Would you comment, Mr. Schmidt, on the statements that Ms. Shand made regarding the interest of developing nations as well as the interests of farmers versus breeders?

Mr. SCHMIDT. The interest in the developing nations, I should also say that this is a global business. We are not living within the U.S. frontiers. Many of the seed companies are dealing worldwide. Our own company deals in at least 10 different countries, including developing countries.

We do breeding in those developing countries, and the germplasm in many instances stays right there and it is sold in those countries, and these countries encourage us to come there and breed for their needs. They don't have the money, but we invest that money in those countries. So there is certainly a great opportunity for these people to benefit from these programs.

Senator KERREY. Dr. Watson, can you comment on this issue of developing versus developed and breeder versus farmer interests?

Dr. WATSON. Senator, from the perspective of the certification agencies, I can speak from expressions of interest from other countries that we have in participating within our organization.

We were solely a U.S.-Canada group prior to 1991, when New Zealand petitioned to become part of our organization. Just within the last 2 years, we have also had expressions of interest from Ar-

gentina, Mexico, Australia, and most recently a developing country of Zimbabwe, realizing that increase is a worldwide type of activity and the need to be able to certify and identify those genetic resources, whether they are developed within that country or whether they come from the United States to their countries.

So as Dietrich has said, certainly we are playing on an international field and our testimony is developed to strengthen the U.S. position or maintain that world leadership position that we currently have.

Senator KERREY. Dr. Barnes, do you have a comment on this subject?

Dr. BARNES. In the discussion of the workshop grouping, one of the essences coming out of that is that there must be policies developed to allow just compensation, and it doesn't mean a carte blanche giving away of materials from one country or picking it up and giving it to a developed country. How that just compensation can be worked out is a matter of debate, dialogue, and negotiation.

In terms of being able to develop material transfer agreements or agreements of exchange, these are coming into vogue and I think can alleviate and resolve some of these questions, particularly in terms of developing countries.

Senator KERREY. Certainly the treaty doesn't prohibit these kinds of negotiations from occurring, does it? It seems to me that if a nation, let us say Mexico, for example, held germplasm, that it would be in their interest to get protection in place and encourage seed sales, because it would add value to the germplasm that they hold.

Dr. BARNES. That is correct. That is one of the emphases of trying to get other countries to have protection as well, so that there can be the reciprocal value of exchange.

Senator KERREY. Ms. Shand, I guess what I am saying is that I don't understand how the treaty works against the interest of a developing nation that holds specific germplasm. If they are trying to maximize the value of that germplasm, it seems to me that to get a treaty that protects its value, certainly is in their interest whether it is private or public.

And I must say that the private sector interest would generate for me as an owner more enthusiasm than would the public sector interest, because the public sector interest depends upon Congressional appropriations to have any value, whereas the other is being driven entirely by the market. It seems to me that there would be more value being added with a treaty in place than without it.

Ms. SHAND. I think there are a number of concerns in developing countries, and this issue is extremely complex, but to date, developing countries have declined to adopt plant breeders' rights in their own countries. One reason is that they lack the infrastructure to enforce these rights. Another concern is that oftentimes they see that the material that is protected is based on material that was appropriated one way or another from genetic resources in their own country.

These resources did not come from nowhere. They are the result of farmers' selection over 10,000 years, in some cases. They see material that has been taken out of their country and improved, and there is no question about those improvements. When these materi-

als come back in their country, I think they believe that the people who will most benefit from plant breeders' rights are the companies, the breeders themselves who have made improvements. There is no question about that.

Senator KERREY. Nor objection, necessarily?

Ms. SHAND. I think there is an objection, because they don't see that there has been any adequate compensation made for the original materials that came oftentimes from developing countries.

Senator KERREY. But it seems to me that the company and the country should negotiate what that compensation is going to be.

Ms. SHAND. That is possible, although there are multilateral negotiations underway now. One of these is in the biodiversity convention, but this has yet to be determined.

Senator KERREY. The position of the American Farm Bureau is that the treaty should be ratified with changes dealing with incidental sales, essentially?

Mr. NEIDIG. Yes sir. That is the basic thrust. We talked about some other things. Of course, our farm members are concerned with that farmer position, saved seed, incidental sales, the right to do that.

Senator KERREY. Mr. Robinson, are you moving to the microphone there?

Mr. ROBINSON. Yes sir, Mr. Chairman. May I make a few comments on that?

Senator KERREY. Yes.

Mr. ROBINSON. Thank you. We feel that there must be no provision for sale of a protected variety without permission of the owner. We think this is extremely important for several reasons.

Number one, because it is needed to comply with the 1991 UPOV Convention.

Number two, because there are certain crops, celery, okra, peppers, lettuce, where the market size is fairly small and yet the growers are large enough, given that opportunity of incidental sales, it would have an extremely detrimental effect on those markets.

Number three, no other form of intellectual property rights provides the ability to sell the protected invention, and why should PVPA be any different?

We have protected the practice of planting farm-saved seed on one's own holding. This is competition to the breeder. It does have an influence in terms of limiting the price somewhat. On the other hand, we feel that in fair exchange for that, because we do recognize this practice, that there should be some risk in terms of treated seed, which we think is more of an exception that would be borne by the farmer who uses his farm-saved seed without any kind of compensation to the breeder.

And I think last, once we introduce any kind of incidental sale or right of sale, we create a gray area, and the gray area, I think, will promote more litigation and more conflicts between us and our customers, and we certainly aren't interested in that and I don't believe Farm Bureau is either.

Mr. NEIDIG. If I might respond to that, in agreement partially with what Mr. Robinson is saying, yes, and I think, if you recall, I read in my testimony that we asked for clarification of what inci-

dental sales are. I don't offer that suggestion of what that should be. Certainly an incidental sale for a lettuce seed grower in California would be different than an incidental sale for a soybean farmer in Madison County, Nebraska. Somewhere, there has to be some definition made of what that incidental sale is or should be.

Dr. CLAYTON. Mr. Chairman, I would just observe that I am not sure that the UPOV Convention gives us much flexibility on this point. I think it speaks very clearly that farmers can, in fact, save seed, but farmers or no one else will be in a position to sell saved seed.

I suppose the one concern that we would have on the issue of incidental sales is, at some point, how does one distinguish between an incidental sale and a sale of saved seed? If one incidentally has 2 crop years' worth of seed left and chooses to sell it, that sounds like a sale of saved seed, I would think.

I would wonder too, I guess, on the issue of—it probably would be very different for celery versus some other crop. I am just thinking from a drafting and administrative point of view how one would ever define every situation anyway.

But I think ultimately it comes back to the fact that the UPOV Convention is quite clear and inflexible on that point.

Senator KERREY. Mr. Svik.

Mr. SVIK. I wanted to bring up a point. It seems like sometimes we get a large seed company versus a small farmer situation going, and there are a lot of people involved in sales of protected varieties that are small seed operators, small farmers under the certification program in various States.

Being a State regulator, those are the kinds of calls I get, from the 300 or so growers in Nebraska that are part of the certification program that are selling protected varieties of seed through Title V. So I get calls from both sides of the fence.

I get them from the grower that is unhappy because he has just sold the certified seed to someone and the following year that gentleman is selling brown-bag seed, the very product he sold him prior, and selling it at $3 or $4 less and he is very unhappy with that. Then I get the same call from the guy that I just sent the letter to and he is very unhappy because he has been turned in.

I think when I point that out to people that did get in trouble, that they realize that it is not a big company they are hurting, they are hurting their neighbor, their neighbor who goes through the certification program and does it the right way.

Dr. Watson mentioned 25 percent of their acres are down and I think that is probably a reason why acres are down a little bit in Nebraska. I have a feeling that if people are allowed to continue to have this type of philosophy, that people will drop out of these certification programs simply for the very reason that it will be difficult for them to compete.

Senator KERREY. I am going to conclude this hearing by suggesting that much remains to done.

One of the problems with this particular issue is a tendency to sort of say, well, it is not terribly important. I believe it is a very important economic issue, a very important environmental issue, and a very important world issue, and I intend to work with all of

you and see if we can resolve some of the conflicts and get this ratified by the Senate.

This meeting of the subcommittee is adjourned.

[Whereupon, at 4:18 p.m., the subcommittee adjourned, subject to the call of the Chair.]

[Material submitted for the record follows.]

APPENDIX

LETTER OF THE POTATO ASSOCIATION OF AMERICA

POTATO ASSOCIATION OF AMERICA,
NEW BRUNSWICK, CANADA, *September 20, 1993.*

Hon. TOM DASCHLE,
Chairman, Subcommittee on Agricultural Research, Conservation, Forestry, and General Legislation, U.S. Senate, Washington, DC 20510

MR. CHAIRMAN: The Potato Association of America is pleased to have the opportunity for its representative, Dr. Douches, to appear before this subcommittee on the subject of intellectual property rights for potatoes.

The Potato Association of America is the professional society for potato research, extension, utilization, and technical workers in the Americas, including the United States. The Association also has members in many other countries around the world. In the United States most of the potato breeders, seed industry specialists, extension specialists, and some industry leaders are members of the PAA.

At its 1993 annual meeting in Madison, Wisconsin, the PAA formally supported the inclusion of the potato in the Plant Variety Protection Act at the same time as revisions are made as required by the 1991 UPOV Convention. This position was reached following discussion at the previous annual meeting, and the consideration of a specially prepared review document.

The major reasons for supporting the inclusion of potatoes in the PVPA revisions are summarized as follows:

1. The PVPA meets the requirements of the UPOV Convention which in turn facilitates obtaining protection in other UPOV countries, including Canada and major seed potato exporting countries, and helps to ensure that royalties are returned to the originator.
2. The application for protection under the PVPA is relatively straightforward and can be made by the breeder.
3. With the revisions arising from the 1991 UPOV Convention, PVPA protection will extend to derived varieties such as transgenic varieties developed using biotechnology techniques.
4. The PVPA explicitly recognizes exemptions for breeding potatoes which is important in facilitation continuing exchanges of potato germplasm.

The Potato Association of America asks you to give favorable consideration to this submission. Thank you for your attention.

(Signed) T. RICHARD TARN,
1993-94 President.

LETTER OF THE NATIONAL COTTON COUNCIL

NATIONAL COTTON COUNCIL,
WASHINGTON, DC, *September 17, 1993.*

Hon. TOM DASCHLE,
Chairman, Subcommittee on Agricultural Research, Conservation, Forestry, and General Legislation, U.S. Senate, Washington, DC 20510.

DEAR MR. CHAIRMAN: I am writing to convey the comments of the National Cotton Council of America on S. 1406, the Plant Variety Protection Act Amendments of 1993. We would appreciate your assistance in including this correspondence in the hearing record.

The National Cotton Council is the central organization of the U.S. cotton industry, representing growers, ginners, cottonseed crushers, warehousemen, merchants, cooperatives, and textile manufacturers from California to the Carolinas.

Section 9 of the act would amend section 113 of the Plant Variety Protection Act (PVPA) to remove the provision which allows a person, whose primary farming occupation is the growing of crops for sale for other than reproductive purposes, to sell "saved seed" to other such persons, for reproductive purposes without being in violation of the PVPA. The deletion of the provision allowing farmers to sell saved seed, except as provided in section 12 of the proposed legislation, is necessary to conform to Articles 14(1) and 15(2) of the 1991 revisions to the Union for the Protection of New Varieties of Plants (UPOV). We understand it is not the objective of the amendment to diminish the right of a farmer to save seed for replanting and to use the crop or sell it for other than reproductive purposes.

While we support reasonable action to curb abuses of the "farmer's exemption," we want to ensure the proposed legislation does not restrict the farmer's right to save and replant saved seed in an arbitrarily narrow way which might ignore normal farming practices.

To ensure the right of a farmer to save seed for replanting, we urge the subcommittee to consider establishing a clear legislative history which allows the saved seed exemption to be interpreted in a practical manner recognizing normal farming practices. Specifically, we recommend that the subcommittee clearly state its intent that the exemption is not limited to the replanting of "saved seed" on the same acre from which it was harvested. Instead, the exemption should be administered in such a way as to allow a "farmer" (individual, partnership, corporation or trust) to plant "saved seed" on any acreage involved in the farming operation, whether the land is rented or owned by the individual, partnership, corporation or trust. Such a reasonable definition of "farm" as used in the PVPA or "holdings" as used in the UPOV will ensure that the spirit of the act is met without unduly interfering with normal business practices. Consideration should also be given to the administration of the act when a partnership or corporation holding "saved seed" is dissolved. Farmers are not always individuals working the same acreage year after year. We urge the subcommittee to clearly state that it is not the intent of Congress to limit the exemption in extremely narrow terms.

We also suggest reference in the legislative history to an issue that concerns cotton producers because of the way cotton is processed. Cotton is harvested and delivered to a gin for separation of the lint from the seed. During the ginning process, seed from various farming operations can become comingled because the ginning process is a continuous one. We suggest the incidental comingling during normal processing be within the intent of the exemption.

Section 12 of the act provides that the amendment to the PVPA prohibiting the sale of saved seed shall only apply to applications received before the effective date of the amendment. We strongly support this provision which ensures that producers are not faced with retroactive restrictions. This transition provision provides producers an assurance that the act is to be applied in a prospective and fair manner. We strongly support retention of this important provision and ask that the legislative history encourage development of a system which will enable farmers to easily identify seed that is eligible for resale compared to seed that is not.

We appreciate this opportunity to comment on the proposed legislation. We believe the provisions related to the "farmers' exemption" and the transition provisions are fair and reasonable and can be properly administered with the addition of clear legislative history.

We will be pleased to provide additional information or comments at any time.

Sincerely,

(Signed) JERRY CALVANI,
Chairman.

STATEMENT OF THE INTERNATIONAL ASSOCIATION OF PLANT BREEDERS FOR THE PROTECTION OF PLANT VARIETIES (ASSINSEL)

The International Association of Plant Breeders for the Protection of Plant Varieties (ASSINSEL) is pleased to learn that the Government of the United States of America plans to amend the 1970 Plant Variety Protection Act in order to bring it in line with the new UPOV Convention adopted in 1991.

ASSINSEL, which assembles the national associations of plant breeders of some 20 countries including that of the United States of America, believes that the new UPOV Convention marks important progress for the protection of plant breeders'

rights, respecting at the same time the general interest of states. It is indispensable that adequate protection be given to the creators of new varieties of plants, be they public or private, in order to ensure an acceptable return on investments in constant genetic progress which enables the farmers to remain competitive on the level of world agriculture. The history of the last 30 years shows that, in the advanced countries, the development of new varieties is directly related to the level of protection of intellectual property granted to the breeder, particularly for self-pollinating species such as wheat, soybean, and cotton.

The new convention is especially well balanced because it allows free access to genetic variability in order to create new varieties, at the same time making plagiarism difficult thanks to the concepts of essentially derived variety and of dependence. It also allows the farmers, if the member states so desire, to use farm-saved seed on their own holdings, within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder. ASSINSEL is basically opposed to the use of farm-saved seed because it is difficult in this area to prevent abuses which ruin, in the case of certain species, every effort of research. Nevertheless, it understands that political reasons of states determine their use, but in that case, it is imperative that the reservations expressed in the UPOV Convention be recognized by law.

By means of the concepts of essential derivation and of dependence, the new UPOV Convention opens finally the possibility of establishing a bridge between the system of plant variety protection and that of patent protection of biotechnological inventions. This enables the states to have a coherent and efficient legislative arsenal in the area of plant varieties.

ASSINSEL hopes therefore that the deliberations underway in the United States of America be fruitful and lead to the amendment of the Plant Variety Protection Act, respecting all the major principles of the new UPOV Convention, to the greatest benefit of the American agro-industry as a whole.

STATEMENT OF INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS (UPOV)

I. INTRODUCTION

My name is Arpad Bogsch. I am the Secretary-General of the International Union for the Protection of New Varieties of Plants (UPOV). I am also the Director-General of the World Intellectual Property Organization (WIPO). I have held those positions since 1974. I am a citizen of the United States of America.

II. THE UNITED STATES OF AMERICA AND UPOV

The United States of America is a member of the International Union for the Protection of New Varieties of Plants, along with the following 23 States: Australia, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Poland, Slovakia, South Africa, Spain, Sweden, Switzerland, United Kingdom.

The following states are expected to become members of UPOV in the near future: Argentina, Austria and Uruguay. Keen interest has been shown by a number of other countries.

These countries account for a very high proportion of the world's varieties and seed business.

The *aims* of the International Convention for the Protection of New Varieties of Plants ("UPOV Convention") are to:

- Promote the concept of plant breeders' rights, as recognized in the United States of America under the Plant Variety Protection Act, and
- Promote a set of uniform and clearly defined principles on which the national or regional plant variety protection systems should be based.

At the national level, the *objectives* of the convention are to:

- Ensure that states acknowledge the achievements of breeders of new plant varieties, and do so by means of an intellectual property right;
- Promote continued efforts in plant breeding, a major component of agricultural research;
- Promote the development of agriculture (in the widest sense of the word) and agriculture-based industries, including the production of food and renewable energy and raw materials.

Plant breeding must be seen as an essential tool for sustainable development.

At the international level, the objective of the convention is to create a favorable legal environment for the international trade in plant varieties and seeds, in which the United States of America holds a key position.

III. THE UNITED STATES OF AMERICA AND THE 1991 ACT OF THE UPOV CONVENTION

The UPOV Convention has been revised in a Diplomatic Conference held from March 4 to 19, 1991, with the overall objective of:

- Adapting it to recent and expected developments in the field of economic activity concerned (plant breeding, seed trade, agriculture and agriculture-based industries), in particular developments in biotechnology and genetic engineering, and
- Increasing its positive role in the above-mentioned field.

The three major changes are as follows:

- The 1991 act of the UPOV Convention will ensure that member states will offer protection for varieties of all plant genera and species (thereby extending the incentive to breed new varieties to the whole plant kingdom);
- The 1991 act of the UPOV Convention will ensure that member states will grant to breeders, in respect of protected varieties, more extensive property rights, with appropriate exceptions and limitations (thereby placing the incentive on a larger footing);
- The 1991 act of the UPOV Convention will ensure that member states will grant to breeders a right extending to "essentially derived varieties" (thereby preserving the incentive where a new variety is created by slightly transforming the protected one).

Other changes have also been made in the light of the experience from the application of the currently applicable (1978) act of the convention. S. 1406 would also transcribe those into U.S. law.

At both the Diplomatic Conference and the preparatory meetings, the delegation of the United States of America has been instrumental in setting the standards which will govern the plant variety protection systems in the years ahead. The act was signed on behalf of the United States of America on October 25, 1991, and received the support of the industry concerned.

Concerning the right to save seed, the Federation of Agricultural Producers (IFAP)—the international organization of the world's farmers—considered Article 15(2) of the act "as a reasonable compromise balancing the interests of farmers and breeders, and allowing goverments to determine the reasonable limits of the application of this exemption." In general, the IFAP was the view that "the new UPOV Convention would correctly balance the interests of farmers, consumers and breeders so that society as a whole would benefit from the exploitation of plant genetic resources." (Paragraphs 244.6 and 244.7 of the Summary Minutes of the Plenary Sessions of the Diplomatic Conference, in: Records of the Diplomatic Conference for the Revision of the International Convention for the Protection of New Varieties of Plants, Geneva, 1991, UPOV publication No. 346(E).)

In my view, it is essential for the United States of America to continue to play a leading role in promoting strong and effective, and also well-balanced, intellectual property protection in the field of plant varieties. I recommend adoption of S. 1406.

STATEMENT OF THE NATIONAL COUNCIL OF COMMERCIAL PLANT BREEDERS

My name is Dale Cochran, General Manager of Illinois Foundation Seeds, Inc., and president of the National Council of Commercial Plant Breeders. On behalf of the Council, I am pleased to support and reaffirm our endorsement of S. 1406, a bill to amend the Plant Variety Protection Act of 1970.

Many hours of discussion, research, and planning have gone into this legislation and the NCCPB appreciates your willingness to bring this issue forward for a thoughtful discussion and, hopefully, a quick resolution.

The NCCPB has at least two objectives to accomplish as an organization of plant breeders, representing 60-plus seed companies.

1. To promote plant breeding, plant genetic research, and related plant improvement disciplines as challenging and interesting careers to help ensure a continuing supply of trained plant scientists.
2. To support systems of voluntary protection for the private developer or inventor of plant improvements on a worldwide basis so that the developer can benefit

from the improvement, if he wishes, and provide incentive for further development.

The Council believes that it is in the best interest of American agriculture and U.S. policy to join the 1991 UPOV Convention. The reciprocal plant breeders' rights that are offered with adoption of the 1991 UPOV Convention, assure developers and users of protected varieties of clearly defined and internationally accepted standards.

As supporters of S. 1406, we recognize the importance of validating intellectual property rights protection. Indeed, the 1991 UPOV Convention outlines standards for protecting plant breeders' rights, while at the same time helping to arm developers of new varieties with the protection and incentive necessary to bring new and improved products to the markets. These new and improved varieties are developed with the sole intent of providing the necessary tools American farmers need to maintain a well recognized dominance of agricultural markets and high performing seed. American plant breeders fully understand their responsibility to the farmer. Providing enhanced seeds that incorporate drought resistance and pest resistance help the farmer to be a responsible steward, while achieving higher yields and performance.

1991 UPOV CONVENTION PROVISIONS

The United States is a member of the 1978 UPOV Convention and the NCCPB believes it is important to become a member of the 1991 UPOV Convention. There are certain changes in the 1991 Convention that differ from the 1978 Convention to be considered. The provisions of UPOV pertain only to protected varieties.

The following are the main modifications in the convention:

EXTENSION OF THE SCOPE OF BREEDERS' RIGHTS

The following acts, with some limitations, now require the permission of the breeder. They include:

1. Production or reproduction
2. Conditioning for the purpose of propagation
3. Offering for sale
4. Selling or other marketing
5. Exporting
6. Importing
7. Stocking for any of the purposes

Subject to certain limitation, authorization from the breeder must be obtained in respect of harvested material obtained through the unauthorized use of propagating material of the protected variety. Contracting parties may also provide that the breeder's authorization be obtained in respect to products directly obtained from the harvested material.

INTRODUCTION OF THE PRINCIPLE OF DEPENDENCE

The principle of dependence flows from the term "essentially derived varieties." At the present, the NCCPB defined the term as follows:

> Varieties which are essentially derived but nonetheless clearly distinguishable from existing protected varieties qualify for legal protection but should only be commercialized with the consent of the owner of the original variety.

The principle of dependence would not change the criteria for what qualifies a variety for protection, but if the genetic differences did not meet certain standards, it *could not* be commercialized without permission of the owner of the variety from which it was derived.

RECOGNITION OF THE EXISTENCE OF FARM-SAVED SEED

Although the current PVP Act contains a saved seed provision, the existing UPOV Conventions have no such provision. The new convention simply states that a contracting party *may*, within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder, restrict the breeder's right in relation to any variety in order to permit farmers to use for propagating purposes, on their own holdings, the product of the harvest for which they have obtained by planting, on their own holdings, the protected variety or an essentially derived variety. "Holdings" are considered to be land owned, rented, or leased by a farmer.

It should be noted that the farm-saved seed provision in the new convention *does not* permit the selling of farm-saved seed. In order to be in full compliance with the convention, S. 1406 contains a provision that stipulates that sales of protected varieties of seed are *dependent* on permission granted by the owner of the protected variety.

It has become increasingly apparent that of all the issues before this subcommittee, the most widely discussed component of S. 1406 has centered on this provision. The sale of farm-saved seed has led to the abandonment of research programs on certain crops by seed companies because of an inability to compete with their own varieties. Time considerations preclude going into graphic detail of the casualties resulting from farm-saved sales. This subcommittee, however, will be receiving and incorporating into the official record documented cases of seed companies, large and small alike that have restructured, curtailed, and in the most drastic of examples, abandoned major research programs. All of these actions illustrate a painful, but necessary recognition by seed companies of an inability to compete with farmers capitalizing from substantial financial, human, and research commitments.

A surprising few believe that a variety granted a PVP certificate is just that—a PVP certificate. The seed industry, however, views the PVP certificate as a "patent-like" license that ensures protection and a recognition of development worthy of expected rights and privilege. The NCCPB fully supports the tradition and spirit of the crop exemption. We do not, however, believe that breeders, whether public or private, individual or university, have to expect or accept anything less than full protection. The UPOV Convention permits sales contingent on the permission of the owner of the protected variety. This standard is in keeping with the intent of the PVP certificate and is most importantly, fair and consistent to those who assume the risk and investment.

While S. 1406 will provide this crucial protection to the developer, the benefit extends to the farmer. Farmers need to know that the industry that provides them with the single most important component in agriculture is firmly committed to bringing to the market a steady stream of improved and enhanced seed. Without newer and improved varieties, American farmers cannot compete with our competitors overseas. If our competitors recognize the value and necessity of protecting breeders' rights and we, in turn, fail to do so, our ability to continue dominating agricultural markets will be in serious question. S. 1406 seeks to better position American agriculture by giving those who *develop* the seed protection and those who *utilize* the seed selection they have come to know and expect.

These changes as reflected in S. 1406 are necessary for the continued health and stability of American agriculture. Acceptance and adherence to the 1991 UPOV Convention is in the best interest of all of us who are committed to the *farmer* and to the *breeder.*

Like any business or area of intellectual property, protection and incentive go hand in hand. Risk of capital and market share is real. An inability to protect runs contrary to the spirit of the UPOV Convention and our ability as an industry to foster a partnership with farmer. Seed companies must know that their investment of time, research, and capital is truly protected, without exception.

STATEMENT OF PIONEER HI-BRED INTERNATIONAL, INCORPORATED

Mr. Chairman and members of the subcommittee. My name is Owen J. Newlin and I am here today representing Pioneer Hi-Bred International, Inc. I am member of the Board of Directors and have recently retired as senior vice president, where I was responsible for finance, information management, human resources and production of the North American Seed Division.

Mr. Chairman, we commend you for holding this hearing on the proposed amendments to the Plant Variety Protection (PVP) Act. We also want to commend you and Senator Kerrey for introducing this much needed legislation. We are pleased to provide the subcommittee with Pioneer's perspective on the need to update the PVP Act and offer our suggestions to further strengthen the legislation that has been introduced.

Let me begin by telling you a little bit about Pioneer. Pioneer was founded in 1926 by Henry A. Wallace and a few of his colleagues. He later went on to become U.S. Secretary of Agriculture and Vice President. Today, Pioneer is one of the world's largest independent agricultural genetic supply companies, doing business in more than 60 countries.

Pioneer breeds, produces and sells hybrid corn, hybrid sorghum and hybrid sunflower seed, and pure-line varieties of soybean, Soft Red Winter wheat and alfalfa

seed. We also market inoculants made from naturally occurring organisms for crops and livestock, and we offer a full line of business management services for farmers. Sales of all products during the fiscal year which ended August 31, 1993, totaled over $1.4 billion.

Our research budget during fiscal year 1992–93 was over $100 million or a little over 7 percent of our sales. We make that investment every year so that we can offer farmers the improved genetics they need to increase their crop yields and to make their crops more resistant to drought, diseases and insects.

Pioneer's research is aimed at increasing the efficiency and profitability of farmers. We have done that in the past, and we will continue to do that in the future. But we need to be compensated for that research investment.

That brings us to the issue at hand. Pioneer cannot make the research investment needed to provide farmers with those improved genetic products unless we can be paid for our effort and get a return on that research investment. The current Plant Variety Protection Act does not allow that to happen.

The Plant Variety Protection Act is a cornerstone of legal protection for U.S. plant breeders. Strong protection is necessary to encourage the level of investment in research required to ensure a steady stream of improved varieties. These improved varieties are essential for U.S. farmers to remain competitive in world agricultural markets.

The current Plant Variety Protection Act is significantly flawed by allowing for the sale of seed of a protected variety without permission of the owner. Due to this unfair competition, private investment in varietal development research has plummeted in several major crops and is threatened in others. In addition, ambiguous language contained in the current PVP Act causes needless litigation concerning saved seed between seed companies and their farmer-customers.

Pioneer supports the right of a farmer to save seed of a protected variety to plant on his or her own holdings. We also support the position that a farmer may sell seed of a protected variety only with the permission of the owner of the variety. We believe such seed must meet all the requirements of Federal and State seed laws.

Pioneer supports all other amendments to bring U.S. laws into harmonization with the 1991 update of the International Convention for the Protection of New Varieties of Plants (UPOV). These amendments are necessary to allow the United States to become a member of the 1991 UPOV Convention and for U.S. farmers to remain competitive in world agricultural markets.

Mr. Chairman, a variety doesn't just spring into being as a part of nature's handiwork. It takes years. It is the career enterprise of a plant breeder. It requires the careful application of the science of genetics, detailed observation, testing and recognition of events which occur with a frequency of less than one in 100,000, insight, imagination, and luck. Nature supplies the luck, the plant breeder supplies everything else. Through his or her work, the plant breeder creates something that has not existed before. It is something of value—property. And the creator of a piece of property owns it.

This is the same basic principle applied in literature and art. We all start with the same alphabet, the same words, the same colors. Some of us create something of value—a book, a poem, a painting. As a result, we own it. The essence of owning property is that we are entitled to have our ownership protected under the law.

The commercial reproduction and sale of our PVP-protected, proprietary varieties is no different in principle than the commercial duplication and sale of printed materials, computer software, integrated circuits, and prerecorded audio and video cassettes, all of which are currently illegal, and in some cases are criminal offenses. We are facing the same problem now in the seed industry.

Farmer-to-farmer sales of protected varieties take commercial advantage of the years of work that have gone into the creation of these varieties, denying the developers a fair return on their investment in research, yet putting back nothing in terms of research for the future. It is our belief that commercial research programs for varietal crops are threatened.

It costs approximately $1 million in research alone to develop a significant and successful new variety. We must recoup our investment in that variety to stay in business. We cannot do that if we must compete with others selling our proprietary varieties in the marketplace.

According to World Bank Discussion Paper 112, published in 1990, the number of private sector soybean breeders in the United States increased from two in 1966, 5 years before adoption of the PVP act, to 63 in 1984, 13 years after. Between 1977 and 1986, the share of acreage planted to privately developed varieties in the United States tripled, to 86 percent.

In view of those results, one might be tempted to question whether the situation requires a change in the U.S. law. But it is not enough for us to be satisfied with the status quo in American agriculture. American seed companies are under global pressures to either perform or drop out of the competition. That performance is measured not in the commodity markets, but in the financial markets of the world. Simply put, there is a fundamental financial reason why hybrid crops account for about 125 percent of Pioneer's total annual profit: Faced with unfair price competition from brown-bag seed, the varieties we have spent several years and millions of dollars to develop cannot return the profits our investors require. That forces us to make some unpleasant decisions.

In 1989 Pioneer announced its decision to discontinue its North American activities in Hard Red Winter and Hard Red Spring wheat. Among the key factors that resulted in the decision were:

1. Low or negative profit margins in the Hard Red Winter and Hard Red Spring wheat seed businesses because of the minimal pricing flexibility and loss of market opportunity due to "brown-bagging."
2. In the 6 years between 1984 and 1989, financial losses were experienced annually in Hard Red Winter and Hard Red Spring wheat, with the exception of 1 year in which Hard Red Winter wheat broke even. Losses totaled nearly $6 million over this period, and projections for the future did not show prospects for improvement.
3. Farmers in the areas where Hard Red Winter and Hard Red Spring wheat are grown typically save some of their crop to use as seed rather than purchasing new bagged seed. Specifically, 80 percent of the farmers in the Hard Red Winter wheat area and 70 percent in the Hard Red Spring wheat area did not purchase new bagged seed from a commercial seed company. It did not appear that this trend would change.
4. Plant Variety Protection laws designed to encourage proprietary varietal development were not effective.

Here are some more specific facts: Official Kansas agricultural statistics published in February 1989 indicated that 9.5 percent of the acres planted to Hard Red Winter wheat in Kansas were planted with Pioneer Variety 2157. While one might expect us to be pleased at having such a successful variety, our sales statistics for the same period show that in that growing season, we sold a total of 100,600 units of wheat seed in the States of Kansas, Nebraska, Colorado, and part of Wyoming combined. We know that all of that seed was not planted in Kansas, but even if it had been, our market share based on sales would have been 0.8 percent, not the 9.5 percent suggested by the planting data.

Looked at another way, these figures mean that Pioneer sold only 8.4 percent of the seed necessary to plant those acres of our own proprietary 2157 variety, while brown-bagged seed and saved crop accounted for the other 91.6 percent!

After our decision was announced, a story on the Knight-Ridder Financial wire service contained these comments:

• Steven Graham, Kansas Wheat Commission administrator: "We're now beginning to understand what we're up against. It [the departure of Pioneer] could definitely have an impact within our own country."

• Lowell Burchett, executive director of the Kansas Crop Improvement Association: "Wheat farmers have taken a real big hit with the withdrawal of these two companies [Pioneer and Cargill]. There's a lot less research going to be done on HRW wheat, and from my perspective, that's not good to see."

• Rollie Sears, Kansas State University wheat breeder: "Total dollars for wheat research probably will be cut." The loss of Pioneer is "a significant setback for all of us in the wheat breeding community. Some of that [private company seed research] we can pick up, but some of it's going to be lost forever."

• In addition, an editorial in the Farm & Ranch Guide said: "* * * we can't help but think that producers will lose the benefit of having a major company involved in wheat research. Competition is good, and we need private companies involved in Hard Red Spring wheat research, along with NDSU (North Dakota State University) and other universities."

• Also, a story in Farm Talk newspaper of Parson, Kansas, quoted George Ham, associate director of the Kansas Experiment Station at Kansas State University: "Plant breeding is a numbers game. When breeders in the private sector fall out, it puts more pressure on the public programs to come up with more competitive varieties. We're very happy to get the germplasm [Pioneer is giving us]. But the fact that Pioneer is getting out is a real loss to U.S. wheat producers."

For Pioneer and other companies to continue taking the risks of investment in research—and at the same time remain profitable and competitive—we must have more effective protection for the intellectual property created by the research.

Why is it important to ensure that research-based commercial seed companies continue to prosper? Public sector plant breeding programs, both Government and university, face declining financial support. We expect that they will continue to make a significant contribution to agricultural progress. But much of that contribution will likely come from their role in training future plant breeders and conducting basic research, rather than from the release of new varieties in crops such as soybeans and wheat.

Even more troublesome is the limited capacity of public sector breeding programs. We are referring to the ability to release an assortment of new varieties having different traits and adaptations, rather than a single new variety from time to time.

Why is this significant? Because plants are constantly under attack from a variety of natural forces, including drought, insects and diseases. A variety which thrives one year may not perform as well the next. History reflects this in the Irish potato famine of the 1840s, the powdery mildew devastation of the French wine industry in 1848, red rust in wheat in 1916 and 1917, rust in Brazilian coffee in 1969, and the continuing problems of chestnut blight and Dutch elm disease.

The pervasive effects of diseases caused by viruses, which are notorious not only for their adaptability but their propensity to mutate to create new strains or races of diseases, mean that a new widespread disease or pest outbreak may only be one season away.

In the past, commercial breeding programs have been successful in developing a broad spectrum of resistant varieties. For example, today U.S. farmers have the choice of selecting from approximately 340 different varieties of soybeans, covering all 10 maturity groups, which offer resistance to phytophthora root rot.

An important function of plant breeding research is to offer farmers choices so that they can select the varieties that work well for them. Pioneer has always carried a selection of varieties of varying maturities, disease resistance, and other characteristics so that farmers can choose the variety that best meets their needs.

However, farmers can choose from a selection of varieties only when there are enough economically successful breeding programs to provide a choice. If the current situation continues and the exodus of commercial research becomes complete, agriculture will be woefully underequipped to deal with the next potentially devastating outbreak of disease or pests.

It might seem reasonable to ask: If what we need is more research investment, why wouldn't it be simpler to increase funding for public agricultural research? There are two reasons why that may not be appropriate: effectiveness and efficiency. Effectiveness is doing things right. Efficiency is doing the right things the right way. Private sector research is product-oriented research; public sector research often is not, and justifiably so. It isn't necessary that every research project produce results, but when the future of agriculture is on the line, it is important that every project be judged by whether or not it does produce results.

Other studies cited by the World Bank discussion paper suggest that privately developed varieties are more productive than their publicly bred competitors. Yields of varieties have consistently increased since adoption of the PVP Act.

For a textbook example of the difference, we have the real-world experience of South Korea. In 1975, over 80 percent of the R&D in Korea was government sponsored. Over the next 10 years, that percentage was reversed so that by 1986 over 80 percent of R & D was funded by the private sector. In addition, R & D spending as a percentage of Gross Domestic Product more than tripled. In agriculture, R & D spending, as a percentage of value added, increased by over 45 percent. It was, of course, during that period that Korea became one of the growth economies in the Pacific Rim and made the transition from a developing country to a developed, industrialized country.

The disparity between overall research spending and agricultural research spending, by the way, is attributed in the papers cited by the World Bank study to the availability of patents in other industries and the absence of PVP in Korea for agricultural research.

Induced by the benefits of plant variety protection, other countries are also making significant strides in breeding of self-pollinated crops such as soybeans. In Chile and Argentina, both of which are competitors of the United States in the international commodities market, plant variety protection has stimulated investment in plant breeding research and opened those markets to introduction of varieties developed elsewhere. The result is that they will challenge us more in the

future for a share of the global market, not only in grain sales, but in research investment as well.

Our best estimates are that the volume of brown-bag sales in the United States are at least one to two times the volume of seed company sales. Given a choice between selling to the U.S. market and selling to a foreign market one-half or one-third the size but in which brown-bag sales are not allowed, it's not even a difficult decision. The resulting volume of sales will be the same in both markets, but a seed company can get a better price and make a better profit in a market where it doesn't have to face unfair competition from brown-bag seed.

American farmers cannot remain competitive when seed research investment and seed research results are being funneled into markets in other countries. Stated even more strongly, American farmers have high costs for labor, land, and other inputs, and their foreign competitors are highly subsidized. The only way they can stay ahead of their foreign competition is by continued heavy investment in the research needed to give them a technological lead. And the way to stimulate that investment in research is not through continued encouragement of farmer-to-farmer sales, but by supporting the rights of seed companies to be the only sellers of the products their research has developed, allowing them to make a profit that justifies doing the research.

In addition to the farmer-to-farmer sales provisions in the legislation, there are other aspects of the bill which will bring United States law into harmony with the 1991 text of the International Convention for the Protection of New Varieties of Plants which we support.

These other changes include extending the term of plant variety protection slightly, from 18 to 20 years for most crop plants. They will also broaden slightly the scope of protection provided so that we have more effective tools to enforce our rights against infringers. Most importantly, they will help to put breeders on an equal footing with one another in terms of how commercial germplasm is used for breeding new varieties.

In the past, it was not uncommon for some seed companies to take an existing commercial variety, make minor "cosmetic" changes, and reintroduce the variety as its own development without compensation to the company that developed the original variety and made it an outstanding performer in the first place. This practice has come to be known in the industry as plagiaristic breeding, by analogy to copyright principles.

The seed industry is now in agreement that the practice as it exists today is unfair to those who engage in serious, improvement-directed research, and has endorsed changes which will have the effect of permitting the practice to continue, but only when the original breeder is appropriately compensated for his or her contribution. We are pleased to tell you today that, in our opinion, the proposed amendments to the Plant Variety Protection Act, address these problems.

Finally, there is one recommendation we have to improve the legislation before this subcommittee. We urge you to make a change to Section 12, which addresses the transition from the current PVP Act to the revised PVP Act. We would like the "upgrade" in protection to become available immediately for existing protected varieties. We recommend this only when the owner enforces his or her rights against sales of farmer-saved seed grown on or after the effective date of the act or against essentially derived varieties for which infringing acts first occurred on or after the effective date of the act. With respect to preexisting farmer-saved seed and preexisting essentially derived varieties, the rights of the owner of the protected variety should continue to be determined under the current provisions of PVP Act.

This concludes my prepared remarks. Again, our thanks to you, Mr. Chairman, and to the members of the subcommittee for this opportunity. I'd be pleased to answer any questions you may have.

STATEMENT OF INSTITUTE FOR AGRICULTURAL BIODIVERSITY

What was the motivation for the Plant Variety Protection Act?

Historically the bulk of U.S. plant protection laws have served as a mechanism for companies to apply patentlike protection to varieties of plants that in theory could have occurred naturally. Not to mention that these plants, unlike other items of "intellectual property" (e.g., computer programs, artworks, etc.) provide the basis of our existence.

The origin of the PVPA dates back to the 1930s when the first plant patents were issued. Since that time, stricter international plant protection treaties were used as

grounds for creating the U.S. Plant Variety Protection Act in 1970 and strengthening the act in 1981, in eleventh-hour votes.

Corporate lobbying has always played a role in plant variety protection. Campbell Soup Company successfully lobbied to have certain varieties exempted from the original PVPA.

Who does the PVPA benefit?

Proponents of plant variety protection say that further legislation is necessary to provide financial incentives for the private sector to recover research and development costs. According to representatives of the seed industry, such incentives will lure more funds into research. Because these incentives will eliminate alleged sales losses, they should help seed companies to become more efficient in developing higher yielding and improved varieties. Farmers also will become more efficient through the use of these new varieties which will be offered at more competitive prices, the seed industry claims.

On the surface, the previous argument seems to make sense. However, pricing data from USDA and the Bureau of Labor Statistics shows that prices for seed have not gone down with companies' past seed improvements under PVPA: Cumulative Price Increases 1975–1990—Soybean Prices Paid to Farmers, 39 percent; Consumer Price Index (all goods), 92 percent; Soybean Seed Prices, 104 percent.

Obviously, increasing the number of certified varieties and strengthening PVPA regulations in 1981 hasn't benefited farmers as the American Seed Trade Association suggests. Strengthening plant variety protection laws has only resulted in increasing input costs for an increasingly invaluable crop.

Additionally, many plant breeders admit that a major portion of seed companies' basic research in the United States was done by land-grant universities and USDA facilities at taxpayers' expense. According to University of Massachusetts biologist Garrison Wilkes, prebreeding is rarely done in the private sector because of the time and resource investment required. Additionally, the lineages of several of today's varieties can be traced back to varieties developed by farmers themselves.

Such research and development arrangements are very generous when compared with those of other industries operating within the United States. Given this, why should additional market restraints be issued to further the profits of already profitable multinational chemical and pharmaceutical corporations such as Ciba-Geigy, ICI, Sandoz (Northrup King) and Upjohn (Asgrow)? This is not a situation similar to that of Chrysler Corporation, in which there was a growing market and competition was necessary to maintain consumer price levels. The U.S. market for seed is becoming saturated, and there are hundreds of seed companies.

Further restrictions would benefit the largest of seed companies, the former multinational corporations along with U.S.-based Cargill, DeKalb and Pioneer Hi-Bred International, and French-based Limagrain via U.S.-based Shissler—at the expense of smaller seed companies. These restrictions would exacerbate an already lopsided competition where prices are not set on the basis of fair market value, but on what the frontrunner is charging—a practice which borders on collusion.

In past decades, the United States has been reluctant to grant monopolistic powers to any industry. As evidenced by the telecommunications industry, such powers do not benefit consumers. This is also evidenced by the price of medicines under patent which are manufactured by some of these same companies—companies which before the current furor over health care costs used pharmaceutical analogies to justify their plant protection practices. If patents for life-saving drugs do not enable them to be sold at reasonable prices, how can we assume that similar protection for seed will allow it to be sold at a reasonable price?

Similar arguments are echoed by those within the seed industry. The following is a letter by Brad Biddick, head of Trelay Farms Inc. of Livingston, Wisconsin, a small seed production firm. Biddick currently serves as president of the Independent Professional Seedsmen Association. This letter was written on Sept. 14, 1992, in response to an article in "Farm Futures" about Pioneer being awarded a multimillion dollar settlement against Holden Foundation Seeds:

> The following perspectives are mine alone, but I have been in this business all my life having been educated at the University of Wisconsin and by my grandfather and father.
>
> There is a collision occurring between the reality of farming and the reality of biotech labs. Seed companies are in the middle. With the CRP acres shrinking the overall market for seed corn, reality for seed companies has been an escalation of competition. Give-aways, discounts, pricing gimmicks, financing schemes, you name it. The seed business has resorted to buying

its sales. The 'scuffle' between Pioneer and Holden is only a symptom of this competition disease. The question, though, is price and the effect this atmosphere will have on price.

Million dollar settlements find their way to the pocketbooks of the end users. Farmers end up paying for agricultural lawsuits, as automobile drivers pay for auto accident judgments. With more disputes over the property rights of plants, farmers will find higher seed prices facing them. I just don't believe it is possible for the industry to absorb extreme costs associated with large corporations suing each other over who owns what.

The real collision, however, is the addition of the multinational corporations into the seed business and their expectation of profits from patented plants. The present use of licenses, royalties, surcharges and the Plant Variety Protection Act all translate to higher seed prices. Why would these big players buy up seed companies and invest millions into genetic engineering if they did not expect to recoup their investment? Seed prices could escalate rapidly under this reality, all the while the commodity markets act as if we are in the 1940s. This is where the head-on collision occurs. How can an end product sold on a commodity basis support a fast-changing, high-dollar research game where the players demand profits. This puts the farmer in an ever-increasing bind of higher seed prices.

A 'scuffle?' Hardly, this is a game being played for keeps with extreme possibilities for all players.

Additionally, all three of the major national farm organizations oppose further plant variety restrictions. The American Farm Bureau Federation, which is presenting testimony under a separate cover, has serious reservations regarding the farmer's exemption, conditioning of seed and the definitions comprising the concept of essentially derived seed varieties.

The National Farmers Organization has issued two statements, the first from Tim Ennis, assistant director of NFO's grain department:

> We would only support granting patents and other forms of protection to the companies that sell crop seeds to farmers, when farmers are given equitable price supports based upon the cost of production within this economy. U.S. producers should not be forced to pay for companies' opportunities to make profits without being given an opportunity to make profits themselves.

The second from Thayne Cozart, NFO communications director:

> Our major concern is that undue protection of plant varieties will lead to the market concentration of seed companies.
>
> The future varieties affected by this legislation will be grown under contract and won't go into the mainstream market. This will essentially result in the majority of producers being unable to affect the price that they raise these crops under. It will also leave little choice for producers as to which varieties they grow as it will tend to reduce the development of public varieties through the Land Grant System.
>
> We believe seed companies deserve some protection at least to the point where they can recoup their investment in research and development. Moreover, we're not arbitrarily opposed to the development of trait-specific varieties, because of the potential for societal benefits from them.
>
> However, there must be some restraint in how long a patent will last and the lengths to which a company can go to protect a valuable variety. The public's access to the genetic pool must be maintained. S. 1406 and UPOV do not provide a middle ground for the development of new varieties and the maintenance of the public's access to the gene pool.

The Institute for Agricultural Biodiversity does not deny companies the right to make a reasonable profit. But before near-guarantees of profits are granted by the United States to seed companies operating within its borders, we believe those companies should be the subject of a General Accounting Office audit to evaluate whether farmers and consumers will actually benefit from the strengthening of the Plant Variety Protection Act.

What is at stake besides the bottom lines of companies and farmers?

In a word, safety. The safety of the U.S. food system and the safety of the food systems of those nations who depend on U.S. agriculture are at stake.

The fact that commodity crops are often produced in monocrop cultures or in two-crop rotations exposes these crops to increased environmental pressure from weeds, insects and disease. For example, each year, more and more soybeans are affected by sudden death syndrome (SDS), an obscure disease which destroys an otherwise healthy crop virtually overnight. Unless researchers can find varieties that are resistant to SDS, American consumers could find themselves paying more for vegetable oil and the myriad of other products made from soybeans in coming years.

That research may require going back to past varieties. It could also require the use of emerging technology to genetically alter a current or past variety. Either way, a large genetic pool is crucial for solving the problems of modern agriculture.

The arguments for preserving genetic diversity and ensuring the free-flow of germplasm are just as salient for commodity crops as they are for the medicinal plants of the Amazon Rain Forest. Because commodity crops provide everyday foodstuffs for Americans and others around the world, the effects from the loss of diversity in these crops are more imminent.

S. 1406 has the potential to drastically limit the amount of plant germplasm available to plant breeders and molecular biologists in both the public and private sectors. Through the extension of patentlike certificates issued for what may be only cosmetic differences, a company could lock up valuable genes for 20 or 25 years—far longer than other items of intellectual property and far too many years for an item as necessary as food. Through its ambiguous language regarding essentially derived seed, S. 1406 also creates the opportunity for multimillion dollar lawsuits which could halt the flow of germplasm: Companies will inevitably sue one another as they are already inclined to do.

How can there be a germplasm crisis when there are millions of plants?

There are millions of plants. But modern agriculture's emphasis on yield has greatly reduced the number of varieties being planted. Instilling new genes in plant varieties through traditional or emerging technological means still takes years, far too long where our food system is concerned.

In Europe, where laws similar to S. 1406 exist, there is a frightening dependence upon only a handful of crop varieties. This is because overnight, hundreds of varieties were legislated out of existence. According to a study by Genetic Resources Action International of Barcelona, Spain, 94 percent of The Netherlands Spring wheat comes from just one variety, 61.2 percent of France's Durum wheat comes from just three varieties and two Cargill sunflower varieties comprise over 50 percent of France's sunflower crop.

But such dependence couldn't happen here, could it?

It can, has, and to some extent still is happening. In the early 1970s Southern Corn Leaf Blight destroyed a major portion of the U.S. corn crop. Seed corn companies received a reprimand from the National Academy of Sciences for the lack of genetic diversity which led to this disaster.

The fact that such a disaster happened with hybrid corn is appalling. Hybrid corn is patented by nature—it will not yield true when replanted, so farmers must buy new seed each year in order to get the improved yields of the hybrid. Because of this natural guarantee of a return on investment, more money is spent on hybrid corn research than on research for any other crop.

However, because of the emphasis on yield, only a fraction of the available corn germplasm is being used. And it has been alleged by seed representatives from Northrup King that with the exception of Pioneer, all of the Nation's seed corn companies rely on Holden Foundation Seeds of Iowa for a portion or all of their hybrid parent material.

The shelving of germplasm by companies after buyouts and mergers has also been documented by Kent Whealy of the Seed Savers Exchange in Decorah, Iowa. Additionally, genetic resources have been lost through carelessness, disregard or neglect in both the private and public sectors. Researchers at Ciba-Geigy readily admit that a large portion of U.S. Southern corn lines have been lost. Their defense is that the lines didn't yield as well as their Northern counterparts. However, it is important to note that what may make a plant superior on one day, can make it inferior on the next. An excellent case of this can be found in the search for aflatoxin-free corn.

Aflatoxin is one of the most carcinogenic compounds known, affecting both humans and livestock. It is produced by the fungus *Aspergillus flavus* on the seeds of corn or peanuts, both before and after harvest. The fungus is encouraged by

drought conditions like those of 1988 and those found this year in the U.S. Southeast. Farmers whose grain contains high levels of aflatoxin cannot sell their grain on the market. Because of the lack of heat-tolerant corn germplasm left in the corporate, USDA and land-grant systems, USDA researchers working with those of Ciba-Geigy are having to obtain germplasm from Native Americans in the U.S. Southwest.

Further examples of irresponsibility exist in the private sector with the emphasis on hybridizing crops such as canola and wheat at the expense of existing varieties. This is also apparent in the development of herbicide-resistant and herbicide-tolerant varieties and hybrids at the expense of improving the natural defenses and abilities of existing varieties and hybrids, a practice which blatantly flies in the face of sustainable, long-term agriculture.

Clearly, neither the private nor public sectors has been responsible when it comes to preserving the genetic diversity and safety of our food system.

Won't this lack of diversity be solved with the advent of biotech?

If there was ever a financial incentive for seed companies to maintain diversity, it is with hybrid corn. As we have seen with Southern Corn Leaf Blight and aflatoxin, this has not been the case. Based on past disregard for genetic diversity, we cannot conclude that seed companies' actions will change with genetically engineered varieties of soybeans and other crops. At present, biotech seeds are still years away. So, diversity cannot yet be made, it must be found and preserved.

How do we ensure diversity and in turn safety?

We can ensure safety by requiring accountability. We cannot continue to issue certificates for trivial genetic differences such as flower color that do not benefit society as a whole. We cannot allow companies or public institutions the right to lock up our food supply without first proving their responsibleness.

Until then, we can preserve the farmer's exemption as a fail-safe to ensure that diversity is maintained. Farmers should be allowed to save back enough seed to plant up to six times their acreage. Additionally, both public and private companies should be required to preserve and reveal varieties and lines, regardless of short-term economic viability, to ensure long-term genetic prosperity.

This will prevent us from being in the position of the Europeans who are not allowed to save seed.

But won't such action prevent us from ratifying the new UPOV treaty?

As of this date, NO country has ratified UPOV since the signing 2 years ago. Canada took nearly two decades to ratify the first UPOV. There is no rush to comply with the treaty and legally we are not bound to comply by our signing.

Further, current PVPA laws are not hindering the introduction of new varieties, as seed companies are expected to apply for a record number of certificates by the end of this year. This begs the question of why companies are so actively producing new varieties while simultaneously complaining of losing money on them? Curiously, seed companies cannot distinguish between sales losses from saved seed (which they claim not to mind) and seed sold to other farmers by farmers (which they claim they do mind). Industry leader Pioneer, as evidenced by its statements on sales losses of Hard Red Winter wheat in Kansas, lumps both categories together. Of course, the company also names those sales losses as the reason it abandoned its hard red wheat research program. This, despite the fact that the research was primarily geared toward developing patentable wheat hybrids, not the varieties farmers were saving and exchanging. Do companies like Pioneer not mind granting farmers a saved seed exemption on PVPA only to lobby to have it removed under GATT and NAFTA?

Perhaps more so than S. 1406, the 1991 UPOV ought to be reexamined and publicly debated. UPOV, like GATT and NAFTA sets a precedent for farmers to be robbed of the rights they have had since the first seed was planted. It was, afterall, the right to save seed and exchange seed that allowed the first seeds to be planted.

Our neighbor, Mexico, has negotiated an exemption in NAFTA that does not require it to alter its plant variety protection laws. Surely, the U.S. Government can and should do the same for its farmers, beginning with PVPA and UPOV.

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STATEMENT OF FRITO-LAY, INC.

Frito-Lay, Inc., the Nation's leading snack food company, employs 26,000 nationwide and produces over 100 product lines. The company annually purchases nearly 2.5 billion pounds of potatoes to produce its highly recognized LAY'S and RUFFLES® brand potato chips. Frito-Lay contracts with nearly 200 growers in 35 States each year for the potatoes. Since 1958, the company has maintained a research program dedicated to the development of varieties suitable for the manufacture of potato chips, annually crossing 80,000 or more plants per year.

The development of improved potato varieties requires substantial monetary investment to develop the characteristics desirable for various processing operations. Frito-Lay attempts to control the availability of its proprietary varieties by entering into contracts with growers whereby the company supplies the seed and purchases the potatoes when grown. Frito-Lay believes that protection under the Plant Variety Protection Act should be available to developers of potato varieties to control the propogation of a variety and to protect and recoup the investment made in its development.

Virtually all plants grown in the United States can be granted certain protection if a new variety of that plant is developed. Sexually reproduced plants are subject to breeder's rights under the Plant Variety Protection Act, and asexually reproduced plants, with the specific exception of tuber-propagated plants, are eligible to be patented under the Plant Patent Act. However, unlike the protection afforded most novel plant varieties by the Federal Government, potatoes are "orphans." They

have no coverage under the Plant Variety Protection Act (because they are not sexually reproduced) and no coverage under the Plant Patent Act (where they are specifically excluded).

A review of the legislative history indicates why there is no protection afforded to one who develops an improved strain of potato, yet the rationale for continuing this omission does not exist. The exclusion of potatoes in 1939 under the Plant Patent Act was due to a reluctance to compromise the public needs by providing private rights in a food crop. The Plant Patent Act was intended to foster innovation and provide interest in ornamental varieties of plants and other nursery stock, and has succeeded well in that regard. Recognition of breeder's rights in food crops was acknowledged at a later time when the United States became a signatory to the International Convention for the Protection of New Varieties of Plants (UPOV). United States participation in the UPOV Treaty provided breeders rights for sexually reproduced plants, essentially all of our food crops except potatoes, and has fostered technical investments to develop new varieties of these plants. Although not available in the United States, breeder's rights are afforded to novel potato cultivars in other signatory countries of the UPOV Treaty.

Potatoes are a significant food crop in the United States and throughout the world. In the United States, potatoes are the leading vegetable crop in terms of acreage and farm value, with 1.2 million acres planted in 1991, yielding nearly 42 billion pounds, and over $2.5 billion in sales. Worldwide, nearly 300 million metric tons are produced annually. Improved varieties of potatoes can result in such economic and consumer benefits as higher solids content, reduced internal defects, improved color, inherent pesticide resistance, and extended storage characteristics. There is however, little incentive for potato breeders to seek these improvements because any new variety can be propagated without the breeder's consent.

Frito-Lay respectfully requests that this subcommittee amend the Plant Variety Protection Act to provide protection to developers of potato varieties seeking to control the propagation of a variety and to protect and recoup their investment in its development. Frito-Lay believes that the protection should be afforded to developers as a means of supporting and encouraging investments in varietal development of this significant food crop.

Written Comments Of The

ASGROW SEED COMPANY

Regarding S. 1406

Submitted to The

Subcommittee On Agricultural Research, Conservation, Forestry and General Legislation

20 September 1993

The Asgrow Seed Company (ASGROW) is one of the largest research orientated seed companies in the United States marketing both vegetable and agronomic varieties. ASGROW spends millions of dollars each year on research and development to bring new varieties to the market which it protects under the Plant Variety Protection Act (PVPA). Because the PVPA is not self enforcing, ASGROW has had to resort to litigation in approximately two dozen cases in fourteen states to protect the rights granted it under the PVPA. Virtually all of these cases have involved infringement under 7 U.S.C. §§ 2541(1), 2541(3) and/or 2541(6). The defense in a number of these cases involved claiming the exemption to save and sell seed under 7 U.S.C. § 2543.

Given ASGROW's great investment in the seed business and its difficulties in enforcing the rights granted it under the PVPA, ASGROW believes that S. 1406 is a step forward. The provision eliminating the sale of seed by farmers will benefit not only the seed developers but the farmers as well. Because the farmers can not sell saved seed (without authorization of the owner), the owners will make more sales and feel safer in investing in more research. The more research being conducted the more new and better varieties will be developed. Since the American farmer is only as competitive in international markets as the seed he plants, the newer and better varieties developed will directly benefit the farmers. Therefore, the provision eliminating the farmers ability to sell seed, will in the near future benefit both the seed companies and the farmers; it is a win-win situation.

While ASGROW believes the amendments in S. 1406 will help both the research orientated seed companies and the American farmer, ASGROW believes that some amendments to S. 1406 are required. The remainder of this statement will be devoted to our proposed amendments and the reasons for them. Our comments will be by page and line number of S. 1406.

Page 2, line 23 thru page 3, line 23

Defining "Essentially Derived Variety" is a very difficult task even when done on a crop-by-crop basis as various professional/trade groups have found when attempting

to do so. Probably the most the statute can do is frame Congressional intent.

We are concerned that other parts of the description are vague and give little guidance to those who will interpret the statute. For example, paragraph (iii) of the definition (Page 3, lines 11-16) could be interpreted to include varieties with multiple, significant differences resulting from the "act of derivation" as being essentially derived. We believe this is beyond the intent of S. 1406. Conversely, a strict interpretation could mean that a change in any one of the "essential" characteristics of a variety would be sufficient to make a variety independent. We propose that paragraph (iii) be changed to read:

> (iii) conforms to the initial variety in the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety, unless multiple essential characteristics have been changed by the act of derivation and these changes lead to differences in performance, adaptation, maturity, end use characteristics, or other significant attributes.

We believe this change would provide significant additional guidance on the intent of the provision.

Page 5, lines 10-18

This section should be omitted.

As written this section permits rather large amounts of seed to be sold provided it is alleged that the seed was:

> done as an integral part of a program of experimentation
> or testing to ascertain the characteristics of the variety,

This could easily lead to abuses and create problem of the type and magnitude of the present situation with farmers selling "saved seed". It does not solve a present problem and may only create a significant enforcement problem for the PVP owners. For these reasons it should be omitted.

Page 7, line 13

Omit "(other than fungi or bacteria)" as technically they are not plants.

Page 15, lines 8-11

The proposed amendment would leave the statute, 7 U.S.C. § 2543 reading as follows:

> Except to the extent that such action may constitute an infringement under subsections (3) and (4) of section 111, it shall not infringe any right hereunder for a person to save seed produced by him from seed obtained, or descended from seed obtained, by authority of the owner of the variety for seeding purposes and use such saved seed in the production of a crop on his farm, or for sale as provided in this section. A bona fide sale ....

Why does this portion:

> Except to the extent that such action may constitute an infringement under subsections (3) and (4) of section 111,

remain? Because of this wording there was NO exemption from infringement of section 111, subsections (3) and (4) [7 U.S.C. §§ 2541(3) and 2541(4)]. Therefore, the most seed a farmer could sexually multiply (save) without infringing § 2541(3) was the amount needed to plant his farm. Any additional would have been sexually multiplied as a step in marketing (for growing purposes) and therefore an infringement of § 2541(3). The portion of the statute proposed to be deleted stated:

> Provided, That without regard to the provisions of section 111(3) it shall not infringe ... to sell such saved seed.

What permitted the farmer to sell his "saved seed" was this portion, which is to be deleted. After the amount the farmer could save had been determined by the definition of § 2541(3), then that portion was waived to permit the farmer to sell his "saved seed".

Since no sale of saved seed is permitted under the amendments of S. 1406 (without authorization of the owner), the quantitatively defining phrase at the beginning of § 2543 is no longer needed. If the owner authorizes a person to sell saved seed, the terms including quantity will be specified in the license agreement permitting the sale. It is recommended that § 2543 be amended to read:

(a) It shall not infringe any right hereunder for a person to save seed produced by him from seed obtained, or descended from seed obtained, by authority of the

owner of the variety for seeding purposes and use such saved seed in the production of a crop for use on his farm, or for sale as provided in section (c) of this section;

(b) It is an act of infringement under section 111(1) for a person to sell seed obtained from his harvest for reproductive purposes without authorization of the owner;

(c) A bona fide sale ....

This would be done by adding the underlined portions below and deleting the shaded portions:

~~Except to the extent that such action may constitute an infringement under subsections (3) and (4) of section 111,~~

(a) it shall not infringe any right hereunder for a person to save seed produced by him from seed obtained, or descended from seed obtained, by authority of the owner of the variety for seeding purposes and use such saved seed in the production of a crop on his farm, or for sale as provided in this section;

(b) It is an act of infringement under section 111(1) for a person to sell seed obtained from his harvest for reproductive purposes;

~~Provided, That without regard to the provisions of section 111(3) it shall not infringe any right hereunder for a person, whose primary farming occupation is the growing of crops for sale for other than reproductive purposes, to sell such saved seed to other persons so engaged, for reproductive purposes, provided such sale in compliance with such State laws governing the sale of seed as may be applicable.~~

(c) A bona fide sale ....

Page 15, line 22 thru page 16, line 14

ASGROW finds sections 12 (TRANSITIONAL PROVISIONS) and 13 (EFFECTIVE DATE) not in the best interest of the seed industry or the American farmer because they will:

(1) Delay the introduction of new genetics.

(2) Slow down or reduce research investment until full protection is achieved.

(3) Cause additional expense in the separate tracking and enforcement of individual protected varieties before and after enactment.

(4) Cause confusion and uncertainty among farmer customers.

We strongly recommend that the amendments to the PVPA be equally effective to all current PVP-protected varieties plus new varieties as they are approved. The only exception to this is the proof and support of "essentially derived". Only varieties

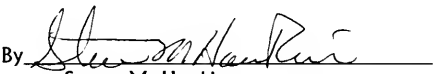
for which application for protection have been filed, or commercial acts performed, on or after the effective date of the act should be found legally dependent upon varieties from which they have been essentially derived.

Section 13 should be deleted because it is our position that the Amendments contained in S. 1406 should become effective on the date that the legislation is passed rather than 180 days after the date of enactment.

Should the committee have any questions of ASGROW, we welcome the opportunity to answer.

Respectfully,

ASGROW SEED COMPANY

By 

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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
RESPONSE TO QUESTIONS AND ANSWERS TO
S. 1406, THE PLANT VARIETY PROTECTION ACT AMENDMENTS OF 1993

1. **Q.** A 1989 OTA report, Patenting Life, stated that the impact of the PVPA was unclear -- that direct stimulation of private investment was approximately that of the preceding 10 years and that increases in private development of varieties have been limited to a few major crops (soybeans and wheat). The original intent of the PVPA was to make more varieties available. How has the number of varieties changed since enactment? Please include a listing by crop in your response.

A. It is difficult to establish a baseline number of varieties which had been released before the passage of the PVPA. Moreover, United States law does not require that a variety be registered or granted a PVP certificate before it is released to the market. If the number of applications received in the PVP Office during the first five fiscal years of its operation is compared with the number of applications received in recent years (see Table A), and if it is postulated that this reflects the situation in general, then an increase in the number of new varieties released per year can be demonstrated for most crops. Note that tomatoes and five other crops were excluded from the PVPA until 1980. Based on data gathered by the PVP Office (see Table B), in some crops (such as soybeans and wheat), the number of PVP applications represents a large percentage of the total number of varieties available, whereas, in other crops, the number of applications received represents only a small fraction of the known varieties.

(SEE CHART ON FOLLOWING PAGE)

Table A. Average Number of Applications Received Per Year for the Crops with the Highest Numbers of Applications 1/

CROP	Column1 FY71-75	Column2 FY76-80	Column3 FY81-85	Column4 FY86-90	Column5 FY91-93	% Change 2/
Soybean	15.8	28.8	41.0	46.2	46.7	195.56
Wheat	9.8	18.9	33.1	16.6	25.0	155.10
Corn	1.8	5.1	15.2	29.2	44.7	2383.33
Bean	11.0	15.5	23.4	18.4	19.7	79.09
Pea	9.4	13.6	18.6	10.0	15.7	67.02
Cotton	10.2	12.3	13.5	12.0	9.7	-4.90
Lettuce	3.6	7.8	6.5	17.0	15.3	325.00
Fescue	2.4	4.3	9.5	15.2	14.0	483.33
Ryegrass	6.0	4.4	8.7	10.0	11.0	83.33
Alfalfa	2.6	4.4	6.9	6.8	4.7	80.76
Barley	2.6	3.0	4.8	5.4	3.7	42.30
Bluegrass	3.2	2.4	3.2	4.6	5.7	78.12
Tomato	0.0	0.0	6.2	5.0	4.0	---
Marigold	2.8	2.4	2.0	3.4	2.3	-17.85
Sorghum	1.0	0.2	0.0	4.6	6.7	570.00
Onion	0.8	1.8	2.6	1.8	3.3	312.50
Oat	1.8	1.6	1.8	1.4	3.3	83.33
Rice	1.4	1.0	1.0	3.2	2.0	42.85
Watermelon	0.8	1.2	2.8	1.4	2.7	237.50
Cauliflower	0.4	1.0	2.0	3.4	1.3	225.00
TOTALS:						
These Crops	87.4	108.0	163.6	215.6	241.3	176.08
All Crops	114.8	139.6	212.3	243.2	289.0	151.74

Owner/Applicant	FY71-75	FY91-93
Foreign Source	10.5%	5.2%
Public Institution	9.9%	13.3%
Private U.S. Company	79.6%	81.4%

1/ Source: PVP Office data.
2/ Percent Change = 100 x [(Column5 - Column1)/Column1]

Table B. Number of Known Varieties of Selected Crops 3/

Crop	# Application Varieties	# Other Varieties (Non-Applications)
Soybean	285 (36.8%)	490 (63.2%)
Wheat	153 (49.8%)	154 (50.2%)
Corn	265 (26.4%)	737 (73.6%)
Rice	18 (6.2%)	274 (93.8%)
Watermelon	10 (4.2%)	226 (95.8%)
Cauliflower	21 (3.7%)	541 (96.3%)

3/ Source: PVP crop databases, records entered between 1986 and 1993. Note that the date a record was entered does not always accurately reflect the date when the variety was released.

2. **Q.** A goal of the PVPA was to focus public expenditures in plant breeding on areas likely to be ignored by private industry -- minor crops and basic research. How much does USDA spend in plant breeding research? Please provide information indicating the expenditures by crop and region and whether the amount and focus changed since enactment of the PVPA.

A. We are unable to make a detailed response on how current funding levels correspond to 1970, the year the Plant Variety Protection Act was enacted, but we believe there has been no major shift over the last 23 years in the relative funding level for plant genetic and breeding research. There has, however, been a reduction in variety development programs on certain crops, specifically corn, wheat, cotton, alfalfa, and tomatoes. The private sector has taken the lead in developing improved varieties of these crops. While we are unable to provide a detailed breakdown of genetic and breeding programs by region, we have no reason to believe it has changed substantially over the last 23 years. A listing of FY 1993 gross funding for plant genetic and breeding programs on specific crops is attached.

(SEE CHART ON FOLLOWING PAGE)

5

Estimated Funding for Plant Genetics and Breeding Research on Major Crops Conducted by the Agricultural Research Service During FY 1993

Major Crops	Gross Funding Level
Trees and Shrubs	$1,793,400
Range Plants	1,984,700
Citrus and Subtropical Fruits	2,526,900
Deciduous Fruits and Tree Nuts	5,001,400
Potatoes	3,753,700
Vegetable Crops	5,840,500
Ornamental Plants and Turf	1,291,200
Corn	4,584,900
Grain Sorghum	788,100
Rice	1,340,400
Wheat	4,081,700
Other Small Grains	2,143,700
Pasture Crops	557,300
Forage Crops	5,962,000
Cotton	2,609,600
Soybeans	5,127,600
Peanuts	953,500
Other Oilseed and Oil Crops	1,053,000
Tobacco	1,242,600
Sugar Crops	5,225,400
New Crops	757,000
General	4,448,400
TOTAL	$63,067,000

3. **Q.** How many of the plant variety protection certificates are from non-US companies? What procedure is used to register a variety from other countries in the US?

A. Based on PVP records, 220 certificates (7.1%) are held by non-US companies. Of these 220, 130 certificates are for agricultural crops such as bluegrass, fescue, and ryegrass, 74 certificates are for vegetable crops such as garden beans, cauliflower, and peas, and 16 are for ornamental crops such as marigold and phlox. There is no difference in how foreign applications are handled in the PVP Office compared to domestic applications. In return, U.S. plant breeders receive the same treatment in other UPOV countries as their own breeders receive.

4. **Q.** Due to the new infringement on harvested materials and the export of propagating material, is there a potential to restrict trade with countries without Plant breeders' rights?

A. While the breeder has rights in the USA over varieties protected in the USA, he/she is without recourse in foreign countries which do not have laws guaranteeing plant breeders' rights. The only thing the USA can do about this is to entitle the breeder to collect royalties on harvested material of his/her protected variety once that material enters the USA. That is all that S. 1406 is intended to do. The bill might deter traffic in contraband goods, but the present PVPA, and public policy, discourage unauthorized trade in protected varieties with countries which have no laws guaranteeing plant breeders' rights. S. 1406 would have no adverse effect on legitimate trade with other countries.

5. **Q.** The UPOV agreement and, therefore, S. 1406, remove part of the farmers' exemption which allows sale of farmer-saved seed. Were farmers consulted about this change?

A. Letters dated March 1991 show that the American Farm Bureau (AFA) was providing input on the farmers' exemption at that time. The letters suggest that the AFB's concern was to preserve the privilege of the farmer to save seed for planting on his/her own holding.

6. **Q.** After accounting for inflation, have seed prices been affected by the initial enactment of PVPA? Are projections available on the likely impact of preventing brown-bagging, as found in the new provisions of S. 1406, on seed prices?

A. Seed prices have increased for many crops; however, hybrid varieties of the crops surveyed in Table 1 have increased less than the rate of inflation from 1970 and 1990. Most other types of varieties have increased in price faster than the rate

of inflation. Table 2 demonstrates the price structure of various classes of seed. Hybrid seed is most expensive, although new varieties, disease resistant varieties, and other types of value-added, or specialty seed are also expensive. Older varieties are generally unprotected by PVPA and tend to be least expensive. Seeds of varieties protected by PVPA are often intermediate in price. By preventing brown-bagging, it is thought that S. 1406 will allow breeders to recover their investment costs over a longer period of time, thus lowering the price of protected seed compared to its current price structure.

Table 1. 1970 to 1990 Average Seed Prices of Selected Crops 1/

Crop	Unit	1970	1990 2/	% Change
Beans, Green	$/lb	0.48	0.56	16.66
Cantaloupes, Hybrids	$/lb	90.00	59.93	-33.41
Cantaloupes, Others	$/lb	3.99	37.74	845.86
Cucumber, Hybrids	$/lb	32.53	28.53	-12.29
Cucumber, Others	$/lb	2.71	13.69	405.16
Lettuce, Head	$/lb	5.64	12.52	121.98
Lettuce, Leaf	$/lb	4.73	10.18	115.22
Lettuce, Romaine	$/lb	3.75	29.31	681.60
Peas	$/lb	0.32	0.48	50.00
Peppers, Hybrids	$/lb	225.00	168.81	-24.97
Peppers, Others	$/lb	10.50	13.02	24.00
Tomato, Hybrids	$/lb	247.78	181.54	-26.73
Tomato, Others	$/lb	11.77	14.07	19.54
Watermelon, Hybrids	$/lb	43.00	44.41	3.27
Watermelon, Others	$/lb	3.33	5.29	58.85
Marigold	$/oz	17.38	14.04	-19.21
Zinnia	$/oz	8.35	9.94	19.04

1/ Source: 1970 and 1990 Burpee Commercial Seed Catalogues.

2/ Reported in 1970 dollars, where purchasing power of 1970$ is 3.36 times that of 1990$. (U.S. Bureau of Labor Statistics)

(SEE TABLE 2 ON FOLLOWING PAGE)

Table 2. Prices of Selected Varieties With and Without PVP Protection 3/

Crop	Variety	PVP	AGE 4/	HYB	1990 Seed Price
Bean, Garden	Delinel	U	N	S	2.80/lb
Bean, Garden	Greensleeves	P	O	S	2.20/lb
Bean, Garden	Greencrop	U	O	S	1.50/lb
Cucumber	Pickalot Hybrid	U	N	H	95.00/lb
Cucumber	Picklebush	P	N	O	78.00/lb
Cucumber	Burpee Pickler	U	O	O	10.75/lb
Lettuce	Red Embers MTO	U	N	S	65.00/lb
Lettuce	Green Ice	P	O	S	21.00/lb
Lettuce	Royal Oak Leaf	P	M	S	18.50/lb
Lettuce	Black-Seeded Simpson	U	O	S	10.50/lb
Marigold	Gold Nugget Hybrid	U	O	H	88.00/oz
Marigold	Happy Red	P	M	O	15.00/oz
Marigold	Bolero	U	O	O	8.75/oz
Marigold	Golden Hawaii	P	O	O	5.50/oz
Pea	Snappy	P	N	S	2.20/lb
Pea	Sugar Daddy	U	N	S	2.05/lb
Pea	Sugar Snap	P	O	S	1.80/lb
Tomato	Big Boy Hybrid	U	O	H	550.00/lb
Tomato	Super Beefsteak	P	M	S	80.00/lb
Tomato	Marglobe	U	O	S	41.00/lb
Watermelon	Sweet Favorite Hyb.	U	O	H	174.00/lb
Watermelon	Sweet Treat	P	N	O	27.50/lb
Watermelon	Sugar Baby	U	O	O	10.00/lb
Zinnia	Firecracker Hybrid	U	O	H	74.00/oz
Zinnia	Pinwheel Rose	P	M	O	32.00/oz
Zinnia	Red Lollipop	P	M	O	32.00/oz
Zinnia	Giant Flowered Mix	U	O	O	5.25/oz

3/ Source: 1990 Burpee Commercial Catalogue. All varieties were sold in 1990 for the prices shown (in 1990 dollars).

4/ PVP : P = Protected; U = Unprotected.
AGE : N = Less than 5 years old; M = 5-10 years old; O = More than 10 Yrs Old.
HYB : H = Hybrid; I = Inbred; O = open-pollinated; S = Self pollinated

7. **Q.** Would the inclusion of "incidental sales" as proposed by the American Farm Bureau Federation be in violation of the UPOV agreement?

A. Yes. The inclusion of "incidental sales" in the provisions of S. 1406 would not conform to the 1991 Act of the UPOV Convention which prohibits sale for reproductive purposes of seed of protected varieties without permission of the owner. However, S. 1406 will not diminish a farmer's privilege to sell seed protected under current law.

8. **Q.** The establishment of a category of "essentially derived varieties" would enable the owner of an "initial" variety to exclude the selling or marketing of varieties that are essentially derived from that initial variety. Some concern has been expressed that the essentially derived category will be too broadly defined. Can essential characteristics be defined? Can they be measured?

A. The question of essential characteristics may vary from species to species and even from variety to variety. Consequently such characteristics can neither be defined on a comprehensive scale, nor measured. Ultimately, this question may have to be answered by court decisions, if owners of initial variety and owners of essentially derived varieties produced from those initial varieties cannot come to an agreement. UPOV is likely to provide additional guidelines over time, as evidenced by the various committees which are currently discussing this topic.

9. **Q.** Should the PVP office consider whether a variety is essentially derived when granting a certificate or should the question of essential derivation be left to litigation?

A. The PVPO determines that a variety is distinct, uniform, stable, and new in issuing certificates of protection. Determining essential derivation would require considering the breeding method and the pedigree to determine essential derivation. The PVPO should have no role in determining whether a given variety is an essentially derived variety. This is also the position of the American Seed Trade Association (ASTA).

10. **Q.** Do the provisions of essential derivation impact on other types of intellectual property protection? For instance - must the owner's permission be obtained if a protected variety is transformed with genetic engineering process and protection is sought under a utility patent?

A. The PVPA enumerates certain acts which require the permission of the PVP certificate holder. If a protected variety is used to produce an essentially derived variety (however that is determined), and a utility patent is granted on that

essentially derived variety, then permission of the certificate holder to perform those acts with the essentially derived variety would be required. Conversely, the patent holder could prevent the owner of the initial variety from making, using, or selling the essentially derived variety.

11. **Q.** Under S. 1406, protected varieties must be identified and sold by a unique variety name. Currently the same variety may be sold under more than one name and farmers may mistakenly conclude that they are getting a new variety. Will this provision requiring a permanent, unique variety name have an impact on the way seeds are marketed?

A. The Federal Seed Act (FSA) states that agricultural and vegetable varieties may have only one legally recognized name, and that name must be used by anyone who represents the variety name in labeling and advertising. In addition, approximately eight states currently have varietal labeling laws that require that the varietal name be stated on the seed container. These statutes provide truth-in-labeling, measures meant to protect farmers and home gardeners who purchase seed. S. 1406 may impact those who have not been following these state and federal laws, and will remove the "variety not stated" option for blends or mixtures which include PVP protected varieties. S. 1406 provides some labeling standards for PVP protected ornamental crops, which are not covered by the FSA. Overall, this section of S. 1406 is expected to benefit the agricultural community.

12. **Q.** Many states allow seed to be sold as variety-not-stated. If the variety is protected under S. 1406, would this preempt state law?

A. The Federal Seed Act allows 36 kinds of agricultural seed to be labeled as "variety not stated" when several varieties are blended or mixed together, rather than list the percentage of each varietal component in the blend or mixture. This exception does not apply to vegetable seeds. As a result, the "variety not stated" labeling affects a minority of the many crops that are marketed in the U.S. To the extent that S. 1406 supersedes state laws and only for PVP protected varieties, some conflict may exist.

13. **Q.** According to the 1989 OTA report, Patenting Life, PVPA may have reduced the flow and exchange of information and germplasm. Would you expect provisions of this bill -- for instance the essentially-derived definition -- to further this trend?

A. The OTA report did not make a finding as to whether PVPA reduced the flow of germplasm -- it quoted contradictory sources on the subject. The introduction of the concept of essentially

derived variety, like other provisions of S. 1406, should stimulate the plant breeding industry and increase the use of information and germplasm through the research exemption.

14. **Q.** Plant breeders, generally, are not interested in conserving exotic germplasm because it is often difficult to use in their breeding programs. Thus, modern varieties tend to have a very narrow genetic base. Would this legislation encourage plant breeders to use collections and expand the genetic differences between varieties?

A. S. 1406 would not significantly alter breeders' use of exotic germplasm. Expanding genetic differences between varieties is a breeder decision based on the crop biology and the breeders' goals. Programs which are making a profit are more likely to fund long range breeding programs. Long range breeding programs would likely increase the use of exotic germplasm and thus broaden the germplasm base of commercial varieties.

15. **Q.** What progress has been made by other UPOV member states in changing their laws to conform to the 1991 UPOV Convention?

A. As of last report, four countries (five including the USA) are proceeding with the development of legislation to change their laws. Countries which are members of the European Community (EC) are waiting for the development of an EC regulation on breeders' rights. Four of those countries, however, have made enough progress to be able to introduce legislation. Four more EC countries and Sweden have begun the process. Thus, 13 countries are committed to the 1991 UPOV Convention. No country has yet ratified it however.

16. **Q.** The NAFTA agreement requires each party to provide protection equivalent to the UPOV. Has Mexico taken steps to become a member of the UPOV?

A. Mexico is not currently a member of UPOV. However, Part 6, Chapter 17, Article 1701, section 1(d), of the NAFTA requires that "If a party has not acceded to the specific test of any such Conventions (UPOV) on or before the date of entry into force of this Agreement, it shall make every effort to accede". NAFTA gives the Parties the option of acceding to the 1978 or 1991 Convention.

Mexico is implementing a two tier system of protection similar to the United States. Patents are in the Secretaria De Comercia y Fomento Industrial and are similar to US patents in the Department of Commerce. Mexican legislation has been passed and the Mexican government is now accepting patent applications. However, Mexican patent law is lacking in its requirements to accede to UPOV.

accede to UPOV.

Mexico has been drafting legislation to implement Plant Breeders' Rights in the Secretaria Agricultura. This would be similar to US Plant Variety Protection in the Department of Agriculture. This would cover all plant varieties which would not qualify for a patent. Together, these two laws would permit Mexico to accede to UPOV. To date, Mexican Plant Breeders' Rights have not been implemented. Until such time, Mexico cannot accede to UPOV.

17. **Q.** The European system of plant breeders' rights currently has restrictions on which varieties may be sold. New varieties must be adaptable and not inferior to current varieties. Will these restrictions be removed under provisions of the new UPOV?

A. The European system of national varietal lists will not be affected by the 1991 UPOV Convention. By the same token, the U.S. is not obligated ever to adopt such a system.

18. **Q.** Section 12, the transition section, leaves current PVPA provisions on certificates already enforce. Does the effective date provision of S. 1406 prevent owners of currently protected varieties from claiming such varieties as "initial varieties"? If future varieties are essentially derived and based on these previously protected varieties, must the prior owners give permission?

A. The effective date provision of S. 1406 would prevent owners of currently protected varieties from claiming such varieties as "initial varieties". If future varieties are essentially derived and based on these previously protected varieties, the prior owners' permission will not be necessary to perform the acts listed in 7 U.S.C. 2541.

19. **Q.** The effective date of the proposed amendments allows farmers to continue to sell farmer-saved seed of the varieties protected under current law. This could cause confusion about which varieties are subject to the restriction on selling of farmer-saved seed. Is it possible to clarify this with labelling?

A. It is indeed possible to write regulations regarding labelling which would help differentiate clearly between varieties protected under present law and those protected under S. 1406. Alternatively, seed companies might voluntarily market the latter varieties in, for example, distinctively colored bags.

20. **Q.** Article 40 of the UPOV Convention states: "This Convention shall not limit existing breeders' rights under the laws..." If the transition section were changed to impose the definition of essential derivation on currently protected varieties, would this be construed as limiting existing breeders'

rights?

A. If a PVP certificate holder under the current PVPA were to be subjected to requirements envisioned for certificate holders on essentially derived varieties under S. 1406, it would be contrary to Article 40 of the 1991 UPOV Convention, because it would limit the rights which were granted with the certificate at the time it was issued (i.e. under present law).

However, to answer the question as stated, it should be said that the effect of such a proposed change in the transition provision (effective date provision) would depend on how the change were written and how it might be construed by the courts.

21. **Q.** What happens to the privilege of saving seed of protected varieties when a landowner-tenant relationship is involved?

A. S. 1406 does not change the wording of Section 113. Right To Save Seed; Crop Exemption as it pertains to saving seed. S. 1406 only deletes the provision for the person saving seed to sell farm saved seed and does not change the wording of the privilege of saving seed. The law would continue to treat landowner-tenant relationships in the same fashion as the present law does.

22. **Q.** Section 8 prohibits conditioning the variety for the purpose of propagation without permission of the owner. Because of the cost of conditioning equipment, seed is conditioned by someone other than the farmer who intends to use it. Under this provision would someone conditioning seed for a farmer be in violation of this prohibition?

A. It is not the intent of the PVPA for the conditioner to be held liable in this case.

23. **Q.** What is the US annual contribution to the UPOV?

A. Approximately $161,000 in 1993.

II

103D CONGRESS
1ST SESSION

S. 1406

To amend the Plant Variety Protection Act to make such Act consistent with the International Convention for the Protection of New Varieties of Plants of March 19, 1991, to which the United States is a signatory, and for other purposes.

IN THE SENATE OF THE UNITED STATES

AUGUST 6 (legislative day, JUNE 30), 1993

Mr. KERREY (for himself and Mr. DASCHLE) introduced the following bill; which was read twice and referred to the Committee on Agriculture, Nutrition, and Forestry

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A BILL

To amend the Plant Variety Protection Act to make such Act consistent with the International Convention for the Protection of New Varieties of Plants of March 19, 1991, to which the United States is a signatory, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE; REFERENCES.

(a) SHORT TITLE.—This Act may be cited as the "Plant Variety Protection Act Amendments of 1993".

(b) REFERENCES TO PLANT VARIETY PROTECTION ACT.—Except as otherwise expressly provided, whenever

in this Act an amendment or repeal is expressed in terms of an amendment to, or repeal of, a section or other provision, the reference shall be considered to be made to a section or other provision of the Plant Variety Protection Act (7 U.S.C. 2321 et seq.).

SEC. 2. DEFINITIONS AND RULES OF CONSTRUCTION.

Section 41 (7 U.S.C. 2401) is amended to read as follows:

"SEC. 41. DEFINITIONS AND RULES OF CONSTRUCTION.

"(a) DEFINITIONS.—As used in this Act:

"(1) BASIC SEED.—The term 'basic seed' means the seed planted to produce certified or commercial seed.

"(2) BREEDER.—The term 'breeder' means the person who directs the final breeding creating a variety or who discovers and develops a variety. If the actions are conducted by an agent on behalf of a principal, the principal, rather than the agent, shall be considered the breeder. The term does not include a person who redevelops or rediscovers a variety the existence of which is publicly known or a matter of common knowledge.

"(3) ESSENTIALLY DERIVED VARIETY.—

"(A) IN GENERAL.—The term 'essentially derived variety' means a variety that—

"(i) is predominantly derived from another variety (referred to in this paragraph as the 'initial variety') or from a variety that is predominantly derived from the initial variety, while retaining the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety;

"(ii) is clearly distinguishable from the initial variety; and

"(iii) except for differences that result from the act of derivation, conforms to the initial variety in the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety.

"(B) METHODS.—An essentially derived variety may be obtained by the selection of a natural or induced mutant or of a somaclonal variant, the selection of a variant individual from plants of the initial variety, backcrossing, transformation by genetic engineering, or other method.

"(4) KIND.—The term 'kind' means one or more related species or subspecies singly or collec-

tively known by one common name, such as soybean, flax, or radish.

"(5) SEXUALLY REPRODUCED.—The term 'sexually reproduced' includes any production of a variety by seed.

"(6) UNITED STATES.—The terms 'United States' and 'this country' mean the United States, territories and possessions of the United States, and the Commonwealth of Puerto Rico.

"(7) VARIETY.—The term 'variety' means a plant grouping within a single botanical taxon of the lowest known rank, that, without regard to whether the conditions for plant variety protection are fully met, can be defined by the expression of the characteristics resulting from a given genotype or combination of genotypes, distinguished from any other plant grouping by the expression of at least one characteristic and considered as a unit with regard to the suitability of the plant grouping for being propagated unchanged. A variety may be represented by seed, transplants, plants, and other matter.

"(b) RULES OF CONSTRUCTION.—For the purposes of this Act:

"(1) SALE OR DISPOSITION FOR NONREPRODUCTIVE PURPOSES.—The sale or disposition, for other than reproductive purposes, of harvested material produced as a result of experimentation or testing of a variety to ascertain the characteristics of the variety, or as a by-product of increasing a variety, shall not be considered to be a sale or disposition for purposes of exploitation of the variety.

"(2) SALE OR DISPOSITION FOR REPRODUCTIVE PURPOSES.—The sale or disposition of a variety for reproductive purposes shall not be considered to be a sale or disposition for the purposes of exploitation of the variety if the sale or disposition is done as an integral part of a program of experimentation or testing to ascertain the characteristics of the variety, or to increase the variety on behalf of the breeder or the successor in interest of the breeder.

"(3) SALE OR DISPOSITION OF HYBRID SEED.—The sale or disposition of hybrid seed shall be considered to be a sale or disposition of harvested material of the varieties from which the seed was produced.

"(4) APPLICATION FOR PROTECTION OR ENTERING INTO A REGISTER OF VARIETIES.—The fil-

ing of an application for the protection or for the entering of a variety in an official register of varieties, in any country, shall be considered to render the variety a matter of common knowledge from the date of the application, if the application leads to the granting of protection or to the entering of the variety in the official register of varieties, as the case may be.

"(5) DISTINCTNESS.—The distinctness of one variety from another may be based on one or more identifiable morphological, physiological, or other characteristics (including any characteristics evidenced by processing or product characteristics, such as milling and baking characteristics in the case of wheat) with respect to which a difference in genealogy may contribute evidence.

"(6) PUBLICLY KNOWN VARIETIES.—

"(A) IN GENERAL.—A variety that is adequately described by a publication reasonably considered to be a part of the public technical knowledge in the United States shall be considered to be publicly known and a matter of common knowledge.

"(B) DESCRIPTION.—A description that meets the requirements of subparagraph (A)

shall include a disclosure of the principal characteristics by which a variety is distinguished.

"(C) OTHER MEANS.—A variety may become publicly known and a matter of common knowledge by other means.".

SEC. 3. RIGHT TO PLANT VARIETY PROTECTION; PLANT VARIETIES PROTECTABLE.

Section 42 (7 U.S.C. 2402) is amended to read as follows:

"SEC. 42. RIGHT TO PLANT VARIETY PROTECTION; PLANT VARIETIES PROTECTABLE.

"(a) IN GENERAL.—The breeder of any sexually reproduced plant variety (other than fungi or bacteria) who has so reproduced the variety, or the successor in interest of the breeder, shall be entitled to plant variety protection for the variety, subject to the conditions and requirements of this Act, if the variety is—

"(1) new, in the sense that, on the date of filing of the application for plant variety protection, propagating or harvested material of the variety has not been sold or otherwise disposed of to other persons, by or with the consent of the breeder, or the successor in interest of the breeder, for purposes of exploitation of the variety—

"(A) in the United States, more than 1 year prior to the date of filing; or

"(B) in any area outside of the United States—

"(i) more than 4 years prior to the date of filing; or

"(ii) in the case of a tree or vine, more than 6 years prior to the date of filing;

"(2) distinct, in the sense that the variety is clearly distinguishable from any other variety the existence of which is publicly known or a matter of common knowledge at the time of the filing of the application;

"(3) uniform, in the sense that any variations are describable, predictable, and commercially acceptable; and

"(4) stable, in the sense that the variety, when sexually reproduced, will remain unchanged with regard to the essential and distinctive characteristics of the variety with a reasonable degree of reliability commensurate with that of varieties of the same category in which the same breeding method is employed.

"(b) MULTIPLE APPLICANTS.—

"(1) IN GENERAL.—If 2 or more applicants submit applications on the same effective filing date for varieties that cannot be clearly distinguished from one another, but that fulfill all other requirements of subsection (a), the applicant who first complies with all requirements of this Act shall be entitled to a certificate of plant variety protection, to the exclusion of any other applicant.

"(2) REQUIREMENTS COMPLETED ON SAME DATE.—

"(A) IN GENERAL.—Except as provided in subparagraph (B), if 2 or more applicants comply with all requirements for protection on the same date, a certificate shall be issued for each variety.

"(B) VARIETIES INDISTINGUISHABLE.—If the varieties that are the subject of the applications cannot be distinguished in any manner, a single certificate shall be issued jointly to the applicants.".

SEC. 4. APPLICATIONS.

Section 52 (7 U.S.C. 2422) is amended—

(1) in paragraph (1), by adding at the end the following new sentence: "The variety shall be named

in accordance with regulations issued by the Secretary.";

(2) in the first sentence of paragraph (2), by striking "novelty" and inserting "distinctiveness, uniformity, and stability";

(3) by redesignating paragraphs (3) and (4) as paragraphs (4) and (5), respectively; and

(4) by inserting after paragraph (2) the following new paragraph:

"(3) A statement of the basis of the claim of the applicant that the variety is new.".

SEC. 5. BENEFIT OF EARLIER FILING DATE.

Section 55(a) (7 U.S.C. 2425(a)) is amended—

(1) by redesignating the first and second sentences as paragraphs (1) and (2), respectively;

(2) in paragraph (1) (as so designated), by inserting before the period at the end the following: ", not including the date on which the application is filed in the foreign country"; and

(3) by adding at the end the following new paragraph:

"(3)(A) An applicant entitled to a right of priority under this subsection shall be allowed to furnish any necessary information, document, or material required for the purpose of the examination of the application during—

"(i) the 2-year period beginning on the date of the expiration of the period of priority ; or

"(ii) if the first application is rejected or withdrawn, an appropriate period after the rejection or withdrawal, to be determined by the Secretary.

"(B) An event occurring within the period of priority (such as the filing of another application or use of the variety that is the subject of the first application) shall not constitute a ground for rejecting the application or give rise to any third party right.".

SEC. 6. CONTENTS AND TERM OF PLANT VARIETY PROTECTION.

Section 83 (7 U.S.C. 2483) is amended—

(1) in the second sentence of subsection (a), by striking "by variety name";

(2) in the first sentence of subsection (b)—

(A) by striking "eighteen" and inserting "20"; and

(B) by inserting before the period at the end the following: ", except that, in the case of a tree or vine, the term of the plant variety protection shall expire 25 years from the date of issue of the certificate"; and

(3) in subsection (c), by striking "repository: *Provided, however,* That" and inserting "repository,

or requiring the submission of a different name for the variety, except that".

SEC. 7. PRIORITY CONTEST.

(a) PRIORITY CONTEST; EFFECT OF ADVERSE FINAL JUDGMENT OR INACTION.—Sections 92 and 93 (7 U.S.C. 2502 and 2503) are repealed.

(b) INTERFERING PLANT; VARIETY PROTECTION.—

(1) REDESIGNATION.—Chapter 9 of title II (7 U.S.C. 2501 et seq.) is amended by redesignating section 94 (7 U.S.C. 2504) as section 92.

(2) AMENDMENTS.—Section 92 (as so redesignated) is amended—

(A) by striking "The owner" and inserting "(a) The owner"; and

(B) by striking the second sentence.

(c) APPEAL OR CIVIL ACTION IN CONTESTED CASES.—

(1) TRANSFER.—Section 73 (7 U.S.C. 2463) is amended by transferring subsection (b) to the end of section 92 (as redesignated by subsection (b)(1)).

(2) REPEAL.—Section 73 (as amended by paragraph (1)) is repealed.

(d) CONFORMING AMENDMENT.—Section 71 (7 U.S.C. 2461) is amended by striking "92,".

SEC. 8. INFRINGEMENT OF PLANT VARIETY PROTECTION.

Section 111 (7 U.S.C. 2541) is amended—

(1) in subsection (a)—

(A) by striking "novel" the first two places it appears and inserting "protected";

(B) in paragraph (1), by striking "the novel" and inserting "or market the protected";

(C) by striking "novel" each place it appears in paragraphs (2) through (7);

(D) by striking "or" each place it appears at the end of paragraphs (3) through (6);

(E) by redesignating paragraphs (7) and (8) as paragraphs (9) and (10), respectively; and

(F) by inserting after paragraph (6) the following new paragraphs:

"(7) condition the variety for the purpose of propagation;

"(8) stock the variety for any of the purposes referred to in paragraphs (1) through (7);";

(2) by redesignating subsection (b) as subsection (f); and

(3) by inserting after subsection (a) the following new subsections:

"(b) The owner of a protected variety may authorize the use of the variety under this section subject to conditions and limitations specified by the owner.

"(c) This section shall apply equally to—

"(1) any variety that is essentially derived from a protected variety, unless the protected variety is an essentially derived variety;

"(2) any variety that is not clearly distinguishable from a protected variety;

"(3) any variety whose production requires the repeated use of a protected variety; and

"(4) harvested material (including entire plants and parts of plants) obtained through the unauthorized use of propagating material of a protected variety, unless the owner of the variety has had a reasonable opportunity to exercise the rights provided by this Act with respect to the propagating material.

"(d) It shall not be an infringement of the rights of the owner of a variety to perform any act concerning propagating material of any kind, or harvested material, including entire plants and parts of plants, of a protected variety that has been sold or otherwise marketed with the consent of the owner in the United States, unless the act involves further propagation of the variety or involves an export of material of the variety, that enables the propaga-

tion of the variety, into a country that does not protect varieties of the plant genus or species to which the variety belongs, unless the exported material is for final consumption purposes.

"(e) It shall not be an infringement of the rights of the owner of a variety to perform any act done privately and for noncommercial purposes.".

SEC. 9. RIGHT TO SAVE SEED; CROP EXEMPTION.

The first sentence of section 113 (7 U.S.C. 2543) is amended by striking "section: *Provided,* That" and all that follows through the period and inserting "section.".

SEC. 10. LIMITATION OF DAMAGES; MARKING AND NOTICE.

Section 127 (7 U.S.C. 2567) is amended by striking "novel" each place it appears.

SEC. 11. OBLIGATION TO USE VARIETY NAME.

Section 128(a) (7 U.S.C. 2568(a)) is amended by adding at the end the following new paragraph:

"(4) Failure to use the name of a variety for which a certificate of protection has been issued under this Act, even after the expiration of the certificate.".

SEC. 12. TRANSITIONAL PROVISIONS.

(a) IN GENERAL.—Except as provided in subsection (b), any variety for which a certificate of plant variety protection has been issued prior to the effective date of this

Act, and any variety for which an application is pending on the effective date of this Act, shall continue to be governed by the Plant Variety Protection Act (7 U.S.C. 2321 et seq.), as in effect on the day before the effective date of this Act.

(b) APPLICATIONS WITHDRAWN AND REFILED.—If a pending application is withdrawn and refiled after the effective date of this Act, eligibility for protection and the terms of protection shall be governed by the Plant Variety Protection Act, as amended by this Act.

SEC. 13. EFFECTIVE DATE.

This Act and the amendments made by this Act shall become effective 180 days after the date of enactment of this Act.

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