

S85

.B3

Hollinger Corp.
pH 8.5

S 85
.B3
Copy 1

University Bulletins Published Quarterly
by the University of Nebraska at the Uni-
versity of Nebraska. Entered at the Post-
Office at Lincoln, Nebraska, as Second-
Class Matter Under act of Congress, July
16, 1896.

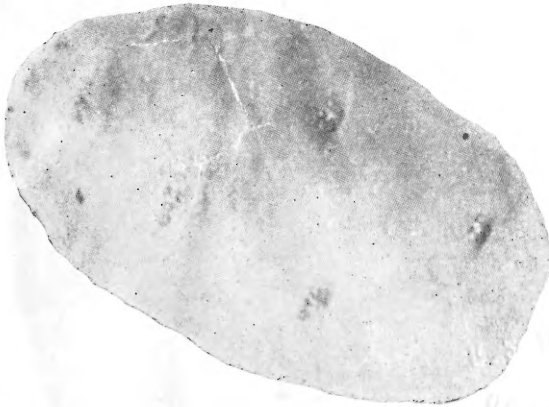
Nebraska Boys' and Girls' Associations.

ORGANIZATION

By E. C. BISHOP

SELECTING POTATOES FOR THE CONTEST

By VAL KEYSER



April, 1908
THE UNIVERSITY PRESS
Lincoln Nebraska

LIBRARY
OF THE
U. S. Department of Agriculture

Class

Book

ORGANIZATION

E. C. BISHOP

Since this bulletin is the first to go into the hands of many of our new members, a brief summary of matters concerning organization is here given.

STATE ORGANIZATIONS

Our state organizations were formed December 15, 1905, at the first corn contest held at Lincoln. Constitutions were adopted, officers elected and provisions made for carrying out the plans adopted. The boys' organization is known as the Nebraska Boys' Agricultural Association, the girls' organization as the Nebraska Girls' Domestic Science Association. Officers are elected at the annual business meeting. The present officers are as follows:

Managers, E. C. Bishop, Deputy State Superintendent of Public Instruction, and Val Keyser, Assistant Superintendent of Farmers' Institutes.

Boys' Association:

President, Claude A. Barker, Pawnee City.

Vice-President, P. W. Sandy, Gretna.

Secretary-Treasurer, Lester Moore, Seward.

Girls' Association:

President, Miss Ellen Inglis, Pawnee City.

Vice-President, Miss Verda Sandborn, Gretna.

Secretary-Treasurer, Miss Grace Aldrich, Ord.

At the third annual meeting, held at Lincoln, January 20-24, 1908, plans adopted for the ensuing year include work in the following departments:

- (a) Corn.
- (b) Potatoes.
- (c) Buttermaking.
- (d) Cooking.
- (e) Needle work.
- (f) Cooking and preserving of vegetables and fruits.
- (g) Flower culture.

It was recommended that each county take up such departments of the work as seemed best for that particular county this year. Potato growing was added especially for the benefit of counties outside the principal corn belt. Buttermaking is recommended for both boys' and girls' work in all counties.

The bulletins are written from a scientific, practical standpoint in terms familiar to the young reader, yet contain information and direction helpful to all who desire definite study and practice. The educational value of the work is fully as important as the development of individual efficiency.

Each of the state officers has been assigned a subject for special investigation. It is his duty to gather data relative to available literature, to investigate and learn what work of interest is being done in his special department and to be in readiness to report the same. The work for this year has been assigned as follows: Corn, Mr. Moore; Potatoes, Mr. Sandy; Buttermaking, Mr. Baker; Cooking, Miss Inglis; Sewing, Miss Aldrich; Flowers, vegetables and fruits, Miss Sandborn.

The University of Nebraska thru the Department of Farmers' Institutes and the State Department of Public Instruction co-operate in conducting the work. The University furnishes speakers and judges for state and county meetings and publishes special bulletins. The State Board of Agriculture assists by providing liberal premium lists for the state contest and at the state fair for exhibits resulting from the work carried on by the state, county and district members of the associations.

The object of the organization is to encourage all young people of the state to become interested in the matters which pertain to the home life; to become efficient in the ordinary duties of the home; to study, to experiment and secure definite results along lines of activity which are important factors in physical, intellectual and moral development.

One state meeting is held each year. This consists of a business meeting, a general program and an exhibition or contest at which the best exhibits made in the various county contests are exhibited and prizes awarded according to merit.

COUNTY ORGANIZATIONS.

The state organization provides for sub-organizations, the first of which is the county organization. These organizations are known as the County Boys' Agricultural Club, and the County Girls' Domestic Science Club. The county superintendent or some person appointed by him is ex-officio manager of the county club. Each club has officers as in the state organization. The duties of the officers are to assist the county manager in carrying out his plans. The principal work comes at the time of the county contest. In some counties a county contest is not held the first year the work is undertaken, the county members being supplied with bulletins and encouraged to take up some particular line of work in their homes; but in nearly all counties a county contest is held, at which the county members are given opportunity to exhibit results of their work.

Very few counties take up all lines of the work each year. Each county chooses some particular work and concentrates effort therein. It is better to do a few things well than to attempt to do more than can be well done. The different departments of work suggested by the state organization are for the purpose of providing one or more lines of work that are especially adapted to each of the different sections of the state. The non-corn growing counties can do excellent work with potatoes and buttermaking. The work in the various girls' departments is applicable to all parts of the state.

SCHOOL DISTRICT ORGANIZATIONS

The school district organizations are sub-organizations of the county and state organizations. Various names are given these organizations: The School and Home Improvement Club, the Agricultural Club, the Gardening Club, and the Boys' and Girls' Industrial Club, are names used in different parts of the state. The teacher or some person appointed by the teacher is ex-officio manager of the school district club. In towns and cities the principal or superintendent of the schools is ex-officio manager. Many of our strong clubs are in rural school districts; others are in town and city districts.

Domestic Science clubs are most common in town and city school districts, yet some strong Agricultural clubs are under the management of town schools. The plan of the work in district clubs is quite similar to that of the county club. The district clubs are generally strong factors in the work of county clubs.

GENERAL DIRECTIONS

The work is designed principally as home work. Do not allow club work to interfere with the regular school work or other home duties. Learn to do well something worth being done. Do the thing that needs to be done. Do not attempt to do too many things at once. Do well the thing attempted. First, learn to do the best thing near at hand. Efficiency in any good work is true and profitable education. He who lives well must eat well, dress neatly and comfortably and enjoy good things; one who eats well, dresses well and enjoys good things must have well-prepared food, proper clothing and proper surroundings; one who prepares good food, proper clothing and pleasant surroundings must be supplied with good materials; one who supplies good materials at a reasonable cost must study well, act intelligently and work effectively. A good home is dependent upon companionship, ability to do, cheerfulness, co-operation and effective service of all members. The home of every member of our boys' and girls' club should be happier and better because of the presence of such member, whatever be the line of work he undertakes. We want every Nebraska home to be the best home that the united efforts of all its members can make it. To do good things intelligently, efficiently and with a cheerful spirit entitles the member to the highest degree of approval given by our organizations.

BULLETINS

Bulletins will be furnished free thru the county superintendent to all members of district and county organizations. Any teacher or other person interested in the work desiring copy of any bulletin may secure the same until supply is exhausted by writing to the county superintendent or to the Registrar, University of Nebraska. These bulletins are in-

tended for only general treatment of the subject discussed. The reader is expected to extend his reading and investigations and to adapt his work to local conditions. The county manager will give instructions for carrying out the work in the county. Each member is requested to become acquainted with the county and district plans and to give special attention to the work planned for each. Write to the county superintendent for desired information.

GROWING POTATOES FOR THE CONTEST

VAL KEYSER

Introduction

In the preparation of this bulletin the writer has attempted to give suggestions concerning the important points which should be observed in order to produce a good crop of potatoes. The steps are taken up in logical order, just as the grower will proceed with the work.

It is impossible to give specific directions as to the exact method to be followed in each of the operations, since the suggestions are of a general nature and the bulletin intended for use in all parts of Nebraska. The boys should use good judgment in each step and consult with the most successful potato growers in their locality. It is worth a great deal to any boy to talk to a successful, enthusiastic man, who understands the business of potato growing. Such a man is not only an inspiration to one, but he can also point out little things helpful to the boy and warn him against mistakes.

Twenty years ago it was an easy matter to grow a crop of potatoes on almost any land in eastern Nebraska. Yields of from two hundred to four hundred bushels per acre were quite common. Late years, one hundred bushels per acre is considered a good yield, and many acres of good land produce even less than this. Now potato growing on a large scale is limited to certain sections of the state. The productiveness of some of the lands has been greatly reduced by constant cropping and weeds have become a serious problem. Insects, diseases and lack of facilities for handling and marketing,

have tended to discourage potato growing on a commercial scale.

It is hoped that this bulletin will interest the boys in potato growing by helping them to overcome some of the obstacles which have hindered growing potatoes as a market crop.

Choice of Ground

The first thing to consider is the choice of ground, or the most desirable place to plant potatoes. A fairly light soil usually produces the best quality of potatoes. Generally speaking, a light soil is one which contains a large portion of sand, tho some soils rich in humus are light and lend themselves easily to cultivation. The sandy soils are light soils and are easy to cultivate. Clay soils are usually heavy in nature and more difficult to work. Where it is practical to do so, select a sandy soil that is rich in decayed vegetable matter. The plat for potatoes should be a fairly level piece of ground which does not overflow and where the drainage is good. Potatoes should not be planted on ground where potatoes were grown last year. If a piece of ground is available which has recently been seeded to alfalfa, clover or grasses, and has produced a crop of corn or small grain the previous year, other conditions being equal, it will be ideal for potatoes. Land which was well manured last year and has produced a crop since, could be selected. Avoid high sloping ground, on account of the danger of washing in times of heavy rains. The ground also dries out more readily in dry seasons. The potato seems to thrive best where conditions of moisture and temperature are fairly constant. Choose the best piece of land on the farm, keeping in mind the suggestions outlined above.

Size of Plat

It is not advisable to plant less than a twentieth of an acre, which would be a strip of ground two rods wide and four rods long. Each boy is encouraged to plant one-tenth of an acre or as much larger plat as he is able to plant and properly care for. It requires a plat four rods or 66 feet square for a tenth of an acre. It may not be advisable to select a square plat, on account of the lay of the land or convenience

in cultivation, in which case a plat two rods wide and eight rods long could be selected, or one rod wide and sixteen rods long. If the plat of ground is sixty-six feet square it will allow for twenty rows three feet apart, and would require to plant it, from one-half bushel to a bushel of potatoes, depending on size of tubers. If the tubers are planted fifteen inches apart the plat will contain 1040 hills.

Preparation of the Soil for Planting

Ground that has been plowed the fall before, especially where the soil has a tendency to be heavy, is usually the best. The ground should be plowed from seven to ten inches deep. Deep plowing affords better drainage, better aeration, and leaves the soil looser, which favors the growth of potatoes. The soil should be free from cornstalks or trash, for this material will interfere with later cultivation of the crop. If the ground must be plowed in the spring, double disk early and plow deep. The disking will mix the trash with the surface soil before it is turned under and leave the ground in better shape for plowing. By plowing the ground early and working it down well with a disk and harrow, the soil will be settled together, making a better seed bed. The land that has been plowed the fall before should also be disked early in the spring. Where the potatoes are planted early, no further treatment is necessary until you are ready to plant.

Seed Potatoes

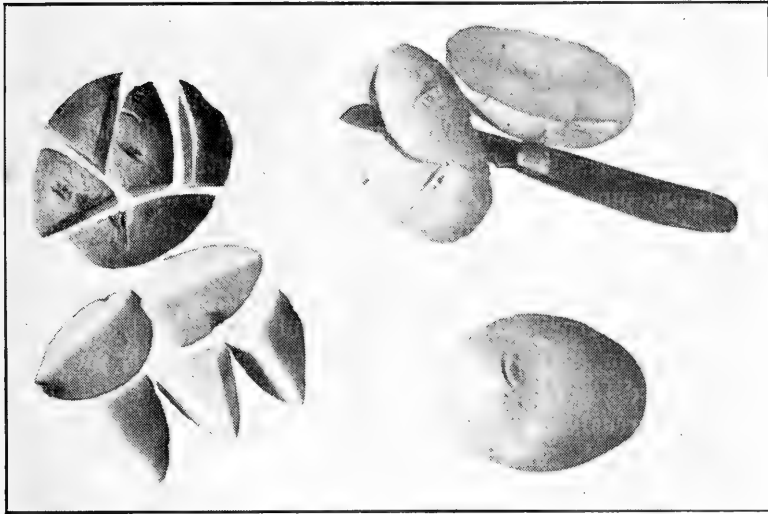
It is perhaps best to use Early Ohio potatoes since this variety is so extensively grown in Nebraska and the Dakotas. This enables one to secure northern grown seed. Experienced potato growers have found that, as a rule, northern grown seed gives the largest yield and greatest per cent of high class tubers. This fact has placed a premium on seed potatoes grown in the Red River Valley. Seed grown in northern Nebraska would do for planting in the southern portion of the state. Some successful potato growers have found that by careful selection year after year, they are able to produce seed potatoes on their own farms which are equal to the best Red River Early Ohio potatoes. If it is possible to secure seed from

these parties, it would be advisable to purchase home grown seed. Each boy should buy his own seed or secure it from the county manager. Do not be afraid to invest one dollar or even three dollars in good seed. If conditions are at all favorable, and the grower performs his part, the tenth acre should produce fifteen to twenty bushels of marketable potatoes. These potatoes should net the grower thirty cents to forty cents per bushel aside from the premiums he may be able to win in the county and state contests. By purchasing in large quantities the county manager may be able to secure the seed at a reduced price. This seed should be purchased as soon as possible and kept in a cool place until time to plant. The average cellar or cave will be suitable.

Choice of Variety.—We wish to encourage the planting of early varieties, but where experience has shown that late varieties are better adapted to the soil, plant the kind that will give best results. The question of variety is not so important as quality. A great many varieties have been originated by growers in different parts of the state which have proven to be superior in their localities. The following early varieties have given excellent results and are considered standard in Nebraska: Early Ohio and Early Six Weeks. The Early Ohio is a great favorite in our state, and if good seed can be secured is considered the most satisfactory potato for general planting. Some growers who have practiced irrigation prefer late varieties on account of increased yield. Carman No. 3, Rural New Yorker, and Sir Walter Raleigh are considered among the very best late sorts.

Cutting Tubers

The seed should be cut and planted the same day. Experience has shown that if seed is allowed to dry out between the time of cutting and planting it will require longer time for growth to start and the potatoes will be slower to come up. There are two general methods used in cutting seed, quartering the tubers, or cutting them into single-eye pieces. Either method can be used. If the potatoes are cut in quarters they should be planted about fifteen inches apart. If single-eye



Showing method of cutting tubers into single-eye pieces.

pieces are used, plant from ten to fifteen inches, this depending somewhat on the location and amount of average rainfall. If the potato is cut in quarters, it should be quartered lengthwise, so that each piece will remain equal in length to the original length of potato. If cut in single-eye pieces, a medium-sized potato usually makes from eight to ten pieces. Care should be taken that each piece contains a good strong eye. The strength of the eye is generally determined by its prominence. A shallow, poorly defined eye is considered to be lower in vitality. The eye of the potato need not be deep but should be well defined. Use good judgment in cutting the tubers; some potatoes may divide nicely into six or eight parts bearing good strong eyes, while it would not be advisable to cut others into more than four pieces.

Treatment of Seed Before Planting

If the seed is perfectly clean and free from scab spots, treatment with some fungicide may not be necessary. But where potatoes are imported, we are not certain that proper

care was exercised in keeping the seed clean and separate from diseased potatoes. Some growers even recommend thoroly washing apparently clean seed before it is planted, when it is not thought best to treat with fungicide. If the seed shows the slightest trace of scab it should be dipped in a solution of formalin. The usual recommendation for the solution is one pint of formalin to thirty gallons of water; or, one ounce to two gallons will answer for all practical purposes. Place the potatoes in a gunny sack, submerge them and leave in solution from an hour to an hour and a half. When the seed is taken from the solution it should be spread out upon a platform or some boards placed together for this purpose, and allowed to dry, as the fumes from the wet potatoes make them disagreeable in planting.

Potato Scab.—The scab is a parasitic fungus which lives on potatoes while they are in the ground. It is reproduced by means of spores which live on potatoes and in the ground where potatoes have been grown. Scab causes brown-colored



Potatoes Affected with Scab.

irregular ruptures in the skin of the potato. Where the potatoes are badly affected the fungus may cover the entire tuber.

It hinders the development of the potato and causes a rough, unsightly appearance which greatly reduces their market value and keeping qualities. The treatment with formalin as above mentioned will largely prevent this disease.

Planting and Covering

The marking out of the furrows could be done while the potatoes are drying after dipping. The furrows should not be opened and left long before the potatoes are dropped and covered. The planting should be hurried thru so that the potatoes can be covered with moist soil. The furrows should be made about four inches deep with a plow or lister. Of course this work can be done by hand, but the boy on the farm should practice doing things in a way that saves as much time and labor as possible. After the potatoes are dropped in the furrow they can be covered by the use of a double shoveled cultivator. This is best done by going twice over each row, the second time leaving the ground ridged from two to three inches high over the potatoes. A disk cultivator is good for this work. The rows should be straight and the covering carefully done so that the ground between the rows can be cultivated in case weeds start before the potatoes are up. The following statement from Bulletin 97, Nebraska Experiment Station, shows relative yields from different depths of planting. The plats were of equal size in each case:

In 1905 two tests were made of different depths of planting potatoes. Depths ranging from one to five inches were tried. The total yields from the two tests were as follows:

Planted one inch deep.....	182 pounds
Planted two inches deep.....	188 pounds
Planted three inches deep.....	298 pounds
Planted four inches deep.....	317 pounds
Planted five inches deep.....	306 pounds

Time to Plant.—One is governed by the locality and the manner in which the soil warms up in the spring, and to some extent by the variety of potatoes. From the first to the

twentieth of April is usually the best time to plant potatoes. In extreme northern Nebraska, potatoes are often planted as late as the middle of May, while in the extreme southern portion of the state in the ordinary season it is safe to plant any time after the 20th of March. The late freezes in the spring of 1907 damaged hundreds of potato patches, and served to caution us against planting too early.

Cultivation

In the ordinary season it is not necessary to stir the soil until the potatoes commence to break thru the ground. If the soil is slightly ridged over the row, it may be gone over with a harrow or garden rake just as the vines are starting, to break the surface soil. This rakes the ridge of the soil down,

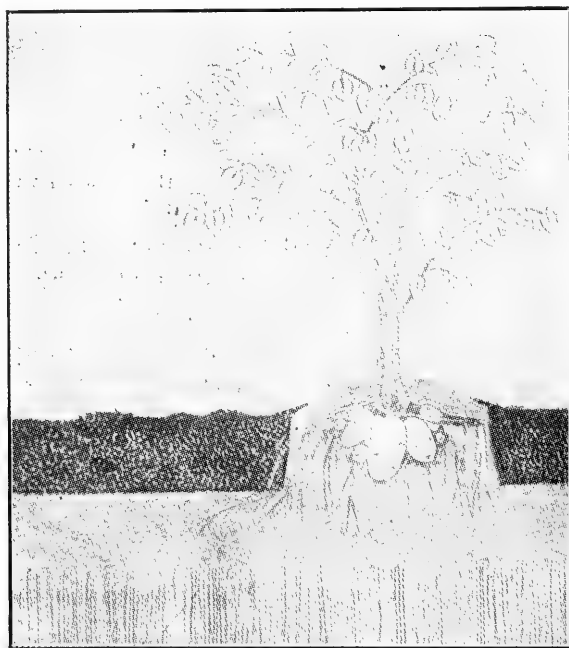


FIG. — —Showing effect of deep tillage. (From Campbell's 1907 Soil Manual.)

leaving the ground level and destroying the weeds in the row, which otherwise would be the most difficult to kill at later cultivations. If the ground has been properly prepared, the harrow can be used to advantage once or twice more before starting the cultivator. Harrowing should be discontinued as soon as the harrow injures the vines. All later tillage should be done with a small shoveled cultivator, running at a depth of from two and one-half to three inches. It is possible to get good results by the use of the hoe provided the soil is properly stirred and not simply scraped, merely cutting off the weeds, as is often the practice. The later cultivations should be done with a small shoveled cultivator, a weeder, or some other implement adapted for this purpose. Experience has shown that the ground should be stirred from two and one-half to three inches deep. As a rule, whatever depth

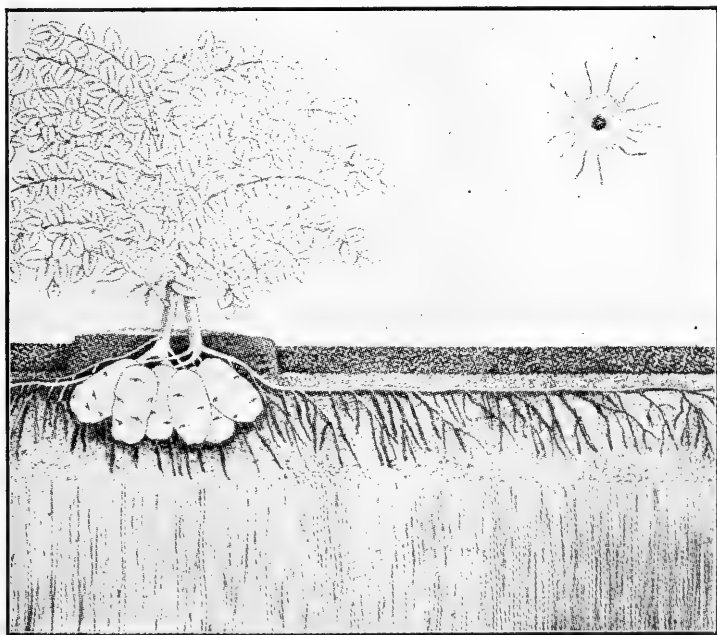


FIG. — —Showing advantage of shallow tillage. (From Campbell's 1907 Soil Manual.)

the soil is stirred at the first cultivation, the cultivator should be run at the same depth for all later cultivations. The ground will dry out as deep as it is stirred, thus establishing a soil mulch two and one-half to three inches deep, which allows the moisture to come quite near the surface. Stirring the soil at this depth also prevents injuring the roots or disturbing the tubers. If the season is exceptionally dry it may be necessary to stir the ground a little deeper in order to hold the moisture. A portion of Bulletin 97, Nebraska Experiment Station, showing the profits from different methods of tillage is here quoted:

“In 1906, two tests of tillage were made. In one case poor and thoro cultivation were compared, and in the other case poor, medium and thoro cultivation. In the first test the poor cultivation plat was harrowed twice and cultivated twice. The cultivating in this plat was done with a large 4-shovel corn plow. The ground was stirred to a depth of at least four inches, the aim being to follow the method in use on many farms in this state. The thoro cultivation plat was harrowed three times and cultivated four times. The cultivation here was given in part with an 8-shovel corn cultivator and in part with a 14-shovel 2-row cultivator. The depth of cultivation was from two to three inches. No hoeing was given either plat. Owing to the fact that the plats were in an old alfalfa field plowed up the fall before, where considerable bluegrass had gained entrance, and that the sod had not rotted thoroly, it was difficult to do a good job of cultivating, especially with the very small shoveled cultivators. The weeds, mostly annual grasses, obtained a considerable foothold in the potato rows, even in the thoro cultivation plat. The poor cultivation plat, however, was much the weedier of the two. The difference was likely due in part to the difference in number of cultivations given the two plats, but probably quite as much to the fact that the ground was green with weeds in the poor cultivation plat before cultivation was begun, while the thoro cultivation plat was always cultivated before or as soon as the weeds began to show at all. The yields from the two plats, each containing 16 rows 60 rods long, were 2,902

pounds from the poor cultivation, and 6,733 pounds from the thoro cultivation, or 48 bushels and 112 bushels respectively. This is 132 per cent more from the thoro cultivation plat than from the poor cultivation plat. The weights of small tubers in the two cases were 726 pounds and 929 pounds, or 25 per cent from the plat given poor tillage and only 14 per cent from the plat given thoro tillage. The value of the crop at the prices received at digging time—\$1.00 per 100 pounds for the large tubers (those over three ounces in weight) and



View of clean cultivated and neglected plats at Nebraska Experiment Station taken just after a rain.

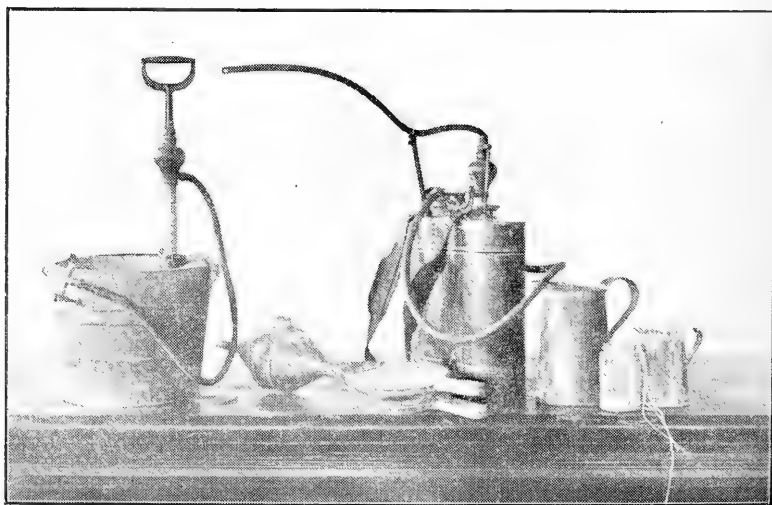
50 cents per 100 pounds for the small tubers—was \$25.39 for the poor cultivation plat and \$62.69 for the thoro cultivation plat. Subtracting the value of the seed, \$7.50 in each case, there remained \$17.89 from the poor cultivation plat and \$55.19 from the thoro cultivation plat. While no records were kept of the actual cost of producing the crop, it is probable that the cost of preparing the land, planting, tilling, harrowing, etc., left very little if any profit from the poor cultivation plat. If the poorly cultivated plat just paid expenses, the

crop that was cultivated thoroly must have paid from \$30 to \$35 per acre above all expenses.”

Weeds.—Perhaps none of the cultivated crops show the effect of careless culture more than potatoes. Weeds rob the soil of moisture and plant food which should go to increase the yield of potatoes. If you are trying to produce the greatest possible yield of tubers you can not afford to allow any weeds to grow in your potato patch.

Spraying

There are two reasons for spraying potatoes,—to kill the potato beetle and prevent disease. It is nearly always necessary to do something to prevent the ravages of the potato beetle. Picking the beetles is a common practice. This is often done by carrying a pail thru the field and pounding or shaking the vines over the pail, into which the beetles fall. They are then usually burned or scalded. This requires considerable time, and is not so satisfactory as spraying or dusting. Any of the arsenic poisons can be used, Paris green, London



Bucket Pump, Bellows Duster and Copper Knapsack Spray Pump.

purple or lead arsenate. Paris green is perhaps the most satisfactory to use and can be purchased from almost any drug store. It varies in price from 30 cents to 40 cents per pound. Use at the rate of one pound Paris green to 100 gallons of water or one ounce to six or seven gallons of water. It is a good plan to add lime about 10 pounds to every 100 gallons of water. The lime will aid in keeping the Paris green in suspension and will also adhere better to the leaves of the potato plants. A convenient method of adding the Paris green to the water is to first put it into a mason fruit jar, which is half filled with water, and then to shake vigorously until the Paris green is thoroly mixed. Every farm should have a sprayer of some description. They will pay for themselves many times over and it is difficult to apply spray material without the use of a sprayer. It can be sprinkled on, but this method wastes a great deal of spray material. Some potato growers prefer to use a dust or Paris green in a dry condition. To do this it is necessary to mix the Paris green with air-slacked lime or flour. Mix at the rate of 1 pound Paris green to 10 to 15 pounds air-slacked lime. Great care should be taken to have the Paris green and lime thoroly mixed, before it is applied. A convenient method of mixing is to spread a layer of lime dust, from one to two inches thick, in a shallow box which has a tight, smooth bottom. Paris green can be kept in an old pepper box. Shake a little out, covering the layer of lime, and then by means of a trowel or garden hoe mix thoroly. Add another layer of lime and more Paris green and continue the mixing until a quantity sufficient to dust the entire patch is prepared. This should be mixed the day before it is used, for it is necessary to apply the dust early in the morning while the vines are still wet with dew or immediately after a shower of rain. Poison prepared in this way can be applied by the use of a flour sieve or any sieve of fine mesh. It can also be carried in a good gunny sack. Shake the sack a little over each hill. Caution.—The sieve that is used for this purpose, also the Paris green and the jar used for mixing, should be handled with care and kept in a tight box where it will be out of reach of little children who are not old enough to

realize the danger of poison. There is no definite time to apply the spray material, for the beetles may come any time during the season. The vines should be sprayed or dusted as soon as the young beetles commence to work. If they are neglected for a few days the beetles may damage the vines so that the growth of the potatoes is materially injured. The beetles also encourage the starting of diseases.

Mulching Potatoes

In some parts of the state it may be better to grow the potato by mulching than by cultivation. Many growers have found this a very satisfactory way to produce a good crop of potatoes. After the ground has been properly prepared by deep plowing and thoroly worked down, forming a good seed bed, shallow furrows can be struck marking out the rows. The cut tubers can be planted the usual distance apart, and covered from one to two inches deep. The mulch may be of clean oat straw, wheat straw, old prairie hay or any other litter that after standing will settle down sufficient to form a mat, which will prevent the growth of weeds and the loss of moisture by evaporation. There are several advantages obtained by mulching. First, the work of cultivation is completed as soon as the mulch is spread. Second, the moisture is retained for a much longer period under a good mulch of straw than under a soil mulch that can be effected by the average system of surface cultivation. Third, a more constant temperature is obtained, which is suited to the growth of the potato. The ground will also receive a much larger rainfall without washing. It may be necessary to thicken up the mulch after the potatoes are nicely started in case it is found that the mulch is too thin to conserve the moisture or prevent the growth of weeds. If the season is dry and hot, the mulch will work very satisfactorily. But should the season be damp and cold, the mulch may retain too much moisture and prevent proper aeration of the soil, which will tend to produce a poor quality of tubers. The grower must use his own judgment as to the advisability of mulching potatoes.

It would be an excellent plan to try two plats of equal size,

each containing from one-twentieth to one-tenth of an acre, one plat to be mulched with straw from four to six inches deep, the other to be kept cultivated thruout the growing season. There are different methods of applying the mulch, as shown in the following extract from Bulletin No. 80, Nebraska Experiment Station:

“Early Ohio potatoes were grown for the mulching tests each of the three years that this method of culture has been under trial. In 1900 the planting was done May 3 and the mulch spread June 12, after the potatoes had been cultivated three times. The unmulched plat was cultivated three times more during the season. In 1901 the tubers were planted April 20 and mulched June 1, after one cultivation, the unmulched plat being cultivated frequently thruout the remainder of the season. In 1902 the date of planting was April 4 and of mulching May 22, the potatoes having been cultivated once between these dates. The unmulched plats were cultivated four times afterwards. The yield of marketable tubers in bushels are given in the following table:

Method of Culture	1900 Lbs.	1901		1902	
		Irrigated	Not Irrigated	High Land	Low Land
		Mulch	88	98	75
Cultivation	83	77	64	86	82

“In 1900 not only was the crop increased about 6 per cent by mulching but the mulched tubers were larger and smoother than the cultivated ones. In 1901 the yield on unirrigated land was increased 17 per cent by mulching. The difference would undoubtedly have been even greater had not the unmulched potatoes been given thoro cultivation, thus producing a fair yield in this unusually dry year, when the potato crop failed in many parts of the state. The mulched tubers were also fully as good in quality as the cultivated ones. On irrigated land in 1901 the mulched potatoes yielded 27 per cent more than the cultivated ones, but owing to the soil's having been kept too wet while the tubers were maturing, they were

rough and watery. Moreover, they did not keep so well as the tubers from the cultivated plat when stored for winter. In 1902 mulching decreased the yield 5 per cent on the high land and 10 per cent on the low land, little difference being noticed in regard to quality of tubers."

Irrigation

Boys living in sections of the state where it is possible to irrigate can, by the use of water, secure the largest yields. It would be advisable for these boys to enter the acre contest. At the Experiment Station, potatoes were irrigated in a small way and very good results secured. A brief report of the work done will be found in Bulletin No. 80, Nebraska Experiment Station.

Harvesting

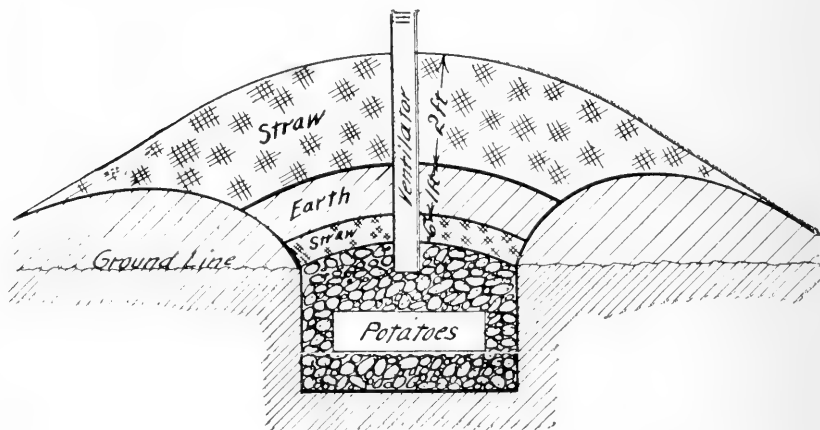
Early potatoes are usually mature and ready to be harvested by the middle of August in most parts of the state, but it is often advisable to leave them in the ground a little longer. In the average season they can remain in the ground as late as the middle of October. The usual method of digging is to throw the potatoes out by the use of a plow or lister. Large growers use the potato digger. It is perhaps better, where the plat is small and has been grown especially for the contest, to dig the potatoes by the use of the potato fork or a spade. This will enable the boy to lift each hill carefully so that the tubers will not be injured in digging. This also gives an opportunity to select a quantity of the most desirable tubers. These should be sacked and kept separate until the final selection. The remainder of the crop can be piled in the field and covered with straw. If the crop must remain in the field long before storing, cover straw with light layer of earth. Potatoes grown in some soils will come from the ground in a clean condition and will require very little cleaning preparatory to exhibiting, while other soils will adhere to the tubers in such a manner that it will be necessary to wash them before one is able to make the selection. As a rule it is better not to dig potatoes when the ground is wet, but in some sea-

sons it is not practicable to follow the rule. The boy should watch this matter closely, for potatoes dug when the soil is in proper condition may save a great deal of labor in handling the crop. If the potatoes were mulched, the mulch may be removed any time after the potato vines are dead to allow the ground to dry out, unless tubers are borne so near the surface that they will sunburn if the straw is removed. Where the ground has been properly cultivated thruout the growing season, the labor at the time of digging is greatly reduced. If the ground has been allowed to become foul with weeds, it will be necessary to remove these weeds before the digging can be pursued with any degree of satisfaction. We hope that our boys will care for their potatoes in such a manner that it will not be necessary to remove weeds before the potatoes can be dug.

Storing

If potatoes are not marketed soon after harvesting, they must be stored in some dark, cool place. The average cellar on the farm is usually very good for this purpose. A good cave which can be closed up tight so that the temperature can be held comparatively low and constant is still better. The potatoes will not be apt to sprout until they have been in storage a long time. The boys who are growing potatoes on a larger scale for the market may find it advisable to store them in the field. The following method of storing potatoes is practiced by some of the largest and most successful potato growers of Nebraska. As the potatoes are dug they are piled in heaps of convenient size and covered with straw. The potatoes can be left in this condition from two to four weeks or until they have gone thru a sweat. Meanwhile a pit can be dug from one to two feet deep, four feet wide and any length desired, which is left open until allowed to cool down to freezing temperature. The long way of pit should be north and south. The potatoes are then put into the pit and nicely rounded up in the center. They are then covered with a layer of from eight to twelve inches of straw (wheat or rye straw

is preferred), over which is thrown three to four inches of dirt which has been removed from the pit. This layer of dirt is allowed to freeze and then more straw and dirt enough to prevent blowing is added. The accompanying cut illustrates this style of storage. A ventilator can be put in but they will keep equally well without and will be sound, firm and in good



Cut showing a Potato Pit.

condition to market in the spring. Potatoes have been kept in this manner until the first of April and when taken from the pit were in fine condition for marketing.

Selecting Potatoes for the Contest

The first thing is to study the score card and become thoroly acquainted with the requirements of the card. This score card was drawn up for the boys' contest work, it being necessary to have a standard by which the exhibitors and the judge can be guided. As soon as you are familiar with the essential points which compose a good exhibit, place the potatoes which have been chosen as worthy of consideration on a table before you, and carefully select the twelve best tubers which conform



A fairly good exhibit of Potatoes, showing proper arrangement on tables.

to the regulations of the score card. If two exhibits are equally good in all respects, except size, the larger potatoes will be given first place unless the judge should deem them too large. It has been found that medium-sized tubers of proper shape usually cook better and are more profitable for seed and for the market. This applies to early varieties rather than late.

Score Card for Potatoes

Variety Name.....

	Value	Score	Score
Uniformity of Exhibit...	20		
Trueness to Type	10		
Shape of Tuber	15		
Size of Tuber	15		
Eyes	5		
Skin	5		
Texture of Tuber.....	5		
Soundness	10		
Freedom from Blemishes..	15		
Total	100		

Contestant's Name.....

Date.....

Explanation of Score Card

Uniformity of Exhibit.—Select twelve potatoes that are uniform in size, shape, color, and which have uniformly well defined eyes of the same depth.

Trueness to Type.—Each potato should be typical of the variety to which it belongs, i. e., the characteristics should be clearly defined, enabling one to easily identify it.

Shape of Tuber.—The shape of the potato will depend largely upon variety, but the flat-round or oval shape is favored, because these shapes usually give best quality tubers.

Size of Tuber.—As a rule, select medium-sized potatoes, but if two exhibits are otherwise equal, choose the larger, unless potatoes are so large as to be considered overgrown.

Eyes.—The eyes of the potato should be medium deep, well defined and not too numerous. Deep eyes cause waste in peeling and have a tendency to affect shape of tuber. Eyes too shallow are low in vitality.

Skin.—The skin may be whitish, brown, redish, yellowish brown, blue or black, depending on variety. It may be thick or thin, tough or brittle. A thick, fairly tough skin is preferred, lenticels not too prominent, or potatoes sunburned.

Texture of Tuber.—This is determined by cutting tuber. A fairly fine grained, brittle texture is preferred. A tough texture does not cook up mealy and is usually poor in flavor.

Soundness.—Select potatoes that are sound and firm, not wrinkled and flabby. Hollow potatoes are objectionable, likewise any internal discoloration indicating a diseased condition. The judge should cut two potatoes in each exhibit.

Freedom from Blemishes.—The judge will deduct from score for scab spots, or skin ruptures from any other disease, cuts, bruises, scratches or any other defects.

Packing Potatoes to Send to Contest

As soon as the final selection has been made, each potato should be wrapped in paper and placed in a box just large enough to nicely contain the twelve potatoes, so that they will not move or roll about and become bruised in handling. The

Box should be lined with two or three thicknesses of newspaper to prevent freezing during shipment.

The individual exhibit will consist of twelve tubers which are grown by the exhibitor.

The Acre Contest

Prizes will be offered to boys competing in the acre contest. The regulations governing the acre contest are: The contestant may choose any variety of potato that he desires, use any method of cutting tubers, choose depth of planting, plant rows and hills any distance apart, he may also cultivate, mulch or irrigate. The prizes will be awarded only to boys who have grown, harvested and weighed a measured acre of ground. Three witnesses will be appointed by the county manager who must swear to the accuracy of the work. Boys who expect to enter the acre contest can arrange with the county manager before the potatoes are planted.

Hill Selection

One advantage in digging potatoes with a fork is the opportunity offered to study the hills. If we wish to increase the yield of potatoes by seed selection, more attention must be paid to the product of each potato planted. The yield of potatoes per hill must be considered by noticing the potatoes of each hill as it is thrown out. We find great variation in the number, shape, size and quality of the potato in different hills. The best hills are those which produce the largest number of medium-sized, nearly uniform potatoes. It is much better to have a hill which contains five to eight medium-sized uniform potatoes than one which produces two or three extra large potatoes and eight to ten too small for use. If potatoes are selected from the best hills and used for seed, the quality of potatoes and yield per acre can be greatly improved.

Potato Diseases

Bordeaux mixture is used to spray potatoes to prevent the diseases which may attack the leaves and stems. Every one

engaged in potato raising, either in a small way or on a commercial scale, should know how to make Bordeaux mixture. In some seasons it will be necessary to spray with Bordeaux to prevent Early Blight. In certain sections of the state potato diseases have caused a great deal of damage. Some of these diseases can be prevented by spraying, but it is questionable if spraying will prevent diseases of the tuber and underground portion of the potato plant, as Dry Rot, Potato Rosette, and Black Shank. If diseases have been injuring the potatoes, there are a few general precautions which can be observed. Plant on new ground or in soil which has not produced a crop of potatoes or beets for the last two or three years. Use only clean seed which has been kept separate from diseased potatoes. Dip all tubers in formalin before planting, and spray the vines with Bordeaux mixture several times during the growing season. In the eastern states where blight and other diseases are serious, growers have been able to increase the yield 50 to 60 bushels per acre by spraying. It was found that a good job of spraying could be done at a total expense of \$4 to \$6 per acre for five applications.

Making Bordeaux Mixture.—Four pounds lime, six pounds copper sulphate, to 50 gallons of water is perhaps the most effective formula to follow. The mixture must be properly made and properly applied for good results. Dissolve copper sulphate in a barrel, containing water, by placing crystals in a clean sack and submerging in water from 15 to 18 hours. Use a pound of copper sulphate to every gallon of water. This solution can be kept for several weeks. In another barrel, slack quicklime, using a gallon of water to each pound of lime. Stir well, while lime is slacking to prevent burning. If the lime is covered with water, it can be kept for several weeks. When ready to make the mixture, two half-barrels are necessary. Into one put six gallons of copper sulphate solution and add 18 gallons of water. Into the other put four gallons of lime solution. Stir well before dipping out the lime and add 22 gallons of water. The two dilute solutions are then poured together into a barrel which contains the spray pump. The mixture is then ready to be sprayed on the potato

vines. If one desires to mix only a small quantity or enough to spray the plot grown for the contest, he may use smaller proportions, as, one quart copper sulphate diluted with four quarts of water, and one quart of lime solution diluted with six quarts of water. This poured together will make three gallons of Bordeaux mixture. In making a small quantity of the mixture, wooden buckets can be used. Use a quart mason fruit jar to dip out copper sulphate solution.

Bordeaux mixture is used to prevent the disease, not to cure it. Therefore it must be applied to the potato vines before the disease appears.

List of Questions

1. What was the total yield of potatoes in Nebraska in 1905 and 1906?
2. Why do potatoes thrive best in light soils?
3. What is accomplished by deep plowing?
4. What are the advantages in shallow cultivation?
5. How many times were your potatoes cultivated? How deep?
6. In how many ways do weeds hinder the growth of potatoes?
7. Why should only clean seed be planted?
8. Why should medium-sized potatoes be selected for seed?
9. How many bushels of medium-sized potatoes will it require to plant an acre, if seed be cut in single-eye pieces, rows 3 feet apart, and hills 13 inches apart in the rows?
10. What will it cost to dip a bushel of seed potatoes in formalin?
11. How many gallons liquid spray material does it require to spray an acre of potatoes once over? What will it cost?
12. How much dust material does it require to dust an acre? What would it cost?
13. What will it cost to mulch an acre of potatoes?
14. How many days does it require from date of planting to mature Early Ohio potatoes? Also Rural New Yorker?
15. What is the best method of storing potatoes in your locality?

16. In how many ways can potatoes be propagated?
17. How many different kinds of insects injured your potatoes in 1908?
18. How many different diseases troubled your potatoes?
19. What methods were used to prevent these diseases and insects?
20. How many bulletins and books on potatoes have you read?

Note.—Dr. F. D. Heald, Botanist, Experiment Station, Lincoln, Nebr., has promised to identify and make report to the grower upon all specimens of diseased potatoes sent to the Experiment Station if specimens are in condition to make identification possible.

Recommended List of Publications

Books—

- “The Potato,” by Samuel Fraser, Cornell University, Ithaca, N. Y.
- “Principles of Vegetable Gardening,” by L. H. Bailey, Cornell University, Ithaca, N. Y.
- “Vegetable Gardening,” by Samuel B. Green, Minnesota Experiment Station, St. Anthony Park, Minn.

Bulletins—

- Bulletin No. 97, Nebraska Experiment Station, Lincoln, Nebr., “Potato Experiments.”
- Bulletin No. 87, Minnesota Agricultural Experiment Station, St. Anthony Park, Minn., “Potatoes at the University Farm.”
- Bulletin No. 91, Colorado Agricultural Experiment Station, Ft. Collins, Colo., “Potato Failures.”
- Bulletin No. 117, Colorado Agricultural Experiment Station, “The Colorado Potato Industry.”
- Bulletin No. 52, Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma, “The Potato Crop.”
- Bulletin No. 174, Ohio Experiment Station, Wooster, Ohio, “Potato Investigations, Variety Tests, Spraying and Seed Selection.”
- Bulletin No. 290, New York Experiment Station, Geneva, New York, “Potato Spraying Experiments in 1906.”

Bulletin No. 230, Cornell University Experiment Station,
Ithaca, N. Y., "Quality in Potatoes."

Farmers' Bulletin No. 91, U. S. Department of Agriculture,
Washington, D. C., "Potato Diseases and their Treatment."

- Farmers' Institute Lecture No. 2, "Potato Diseases and their Treatment," U. S. Department of Agriculture, Washington, D. C.

LIBRARY OF CONGRESS



0 003 070 586 5

LIBRARY OF CONGRESS



0 003 070 586 5