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THE PRODUCTION OF HAIRY VETCH SEED.

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THE PRODUCTION OF HAIRY VETCH SEED.

INTRODUCTION.

During the past seven years the culture of hairy vetch has increased in the United States at least tenfold. The crop is constantly growing in favor in the Southern States for winter cover and hay. In the North it is being used more and more on sandy lands and also on other soils where red clover no longer gives satisfactory returns. This rapid increase has been in spite of the fact that the seed has been relatively costly, the farmer rarely purchasing it as low as $5 a bushel, while in the last three years the seed has commanded $6 to $9 a bushel. This increase in price seems to be due mainly to the increased American demand, as the actual supply grown in Europe is not large and thus far but little has been produced in the United States. The higher prices will doubtless tend to stimulate the growing of this seed in Europe, but it can be profitably produced in many parts of this country. Undoubtedly it will be economical for American farmers to grow the hairy vetch seed needed locally, and any surplus can always be sold at good prices. In good vetch-seed sections a crop of 5 bushels of hairy vetch and 20 bushels of rye to the acre can reasonably be expected, and under favorable conditions 10 to 12 bushels of hairy vetch seed to the acre can be grown. Even at $3 or $4 a bushel such crops are very profitable, and at this price the demand for the seed would certainly increase enormously. In view of this increasing demand, American farmers are urged to grow seed of this crop, at least for their local use, and also where the conditions prove very favorable to supply the general market. Satisfactory machines are now available to separate hairy vetch seed from rye.

SOURCES OF SEED.

At present practically all the seed used in this country is imported from Russia and Germany. Table I, showing the quantity of seed imported each fiscal year ended June 30 since 1905, together with the import prices, is based on the record of customhouse samples. It will be noted that the quantity of seed imported has increased very rapidly, especially since 1908.

TABLE I.—*Hairy vetch seed importations.*

Fiscal year.	Quantity (pounds).	Average price per pound.	Fiscal year.	Quantity (pounds).	Average price per pound.
1905	73,245	$0.046	1911	954,025	$0.059
1906	68,354	.055	1912	635,470	.087
1907	208,100	.048	1913	1,947,000	.045
1908	242,332	.042	1914	2,181,000	.049
1909	294,896	.039	July 1, 1914, to May 30, 1915	461,736	.061
1910	542,948	.041			

The average price is considerably lower than the average price for a good quality of seed, because in these lots are included many which are low in quality, both on account of adulteration and low vitality.

EUROPEAN METHODS OF GROWING HAIRY VETCH SEED.

In the Baltic Provinces of Russia hairy vetch occurs as a more or less persistent weed in grain fields, and practically all of the supply of the seed from that region is secured by separation from the rye seed.

In Prussia, especially in the provinces of East and West Prussia and Pomerania, there is extensive production for seed, but in Germany generally more hairy vetch is raised with rye for green fodder than for seed. The rate of seeding used in Germany is considerably heavier than that which has been found advisable for seed purposes in this country. The German Agricultural Society recommends sowing 53 pounds of hairy vetch and 72 pounds of rye to the acre, but the average rate of seeding is somewhat less, though the crop is usually grown on light, sandy soil where a comparatively heavy seeding is needed. Hairy vetch seed is universally sown with winter rye and usually with the variety known as Johannesroggen, or St. John's rye. This variety of rye is peculiar in that it can be sown as early as June and at any time thereafter until the latter part of September. It is a very free-stooling variety and makes a large leaf growth close to the ground. This rye supplies excellent pasturage in the fall, and the date of maturity is 10 to 15 days later than common rye.

SEPARATION OF HAIRY VETCH SEED FROM RYE.

As hairy vetch is usually sown in combination with rye it is not necessary to separate the mixed seed as harvested when about one-third of the mixture is vetch. Such mixed seed is far more economical to use than to pay the present high price for imported seed.

When a separation of the seeds is desirable it is easily and effectively accomplished by the use of a spiral separator, known in Europe as "Schneckentrieur," which requires no power, being operated by gravity. This apparatus is covered by United States Letters Patent

No. 627970, dated July 4, 1899, and is now manufactured for sale in the United States. The machines seen in Russia had a capacity of 50 to 75 bushels a day.

A satisfactory separation of vetch seed can also be made by use of a cloth-belt apparatus by means of which the rye or other cereal seed is carried up and away on a belt, while the vetch seed falls over the belt to the bottom. A number of forms of this machine are patented, designed especially for the separation of buckhorn from clover seed. A separation which is sufficiently good for preparing mixed rye and vetch seed for sale locally can be obtained by letting the mixed seed run over a series of inclined boards, each set at a given angle and a slight distance apart, so that the vetch seed will run from one board to another and the rye seed, which does not run so readily, will drop through between the boards. This can easily be made by anyone for home use and requires no power to run, as the seed is simply allowed to fall over a series of steps.

GROWING HAIRY VETCH FOR SEED.

Hairy vetch will produce a good crop of seed in most States. The largest crops have been grown on the Pacific coast, but those produced in the Northern States are but little smaller. In the Southern States the seed crop seems to vary greatly with the season, but good yields have been obtained.

Hairy vetch is a winter annual, behaving like winter wheat. If planted in the srping, it may produce a few blossoms the same season, but will make little or no seed until the following season. If planted in the fall, it ripens its seed crop the following July. Spring sowing is seldom advisable, and then only on the Pacific coast and in the arid regions. When spring sown, it is best to pasture the crop the first season. In the Eastern and Northern States spring seeding should never be practiced, as the plants seldom survive the humid heat of summer.

Through the lack of the proper nitrogen-forming bacteria, hairy vetch frequently fails to produce a crop on land where it has not previously been grown. It is therefore advisable, whenever hairy vetch is seeded on land for the first time, to inoculate the seed with a pure culture of the nitrogen-forming bacteria, or to inoculate the soil with soil from a field where hairy vetch is being grown.

The seed may be sown from the middle of August till November, September being the best month. If sown alone, 40 pounds of good seed to the acre are sufficient, though 60 pounds are frequently used. As a general practice, however, it is better to sow it in conjunction with a small-grain crop—oats, winter wheat, or rye. Oats are often used in the South, but in the North wheat or rye must be used. Rye is the favorite, but if intended for hay the wheat combination is more

nutritious. In growing such mixtures for seed, enough grain is used to make about two-thirds of a stand and 20 pounds of the vetch seed are added. Such a mixed crop is easily cut with a mower having a swather attachment, or even with a binder. If more vetch is used it is liable to lodge, especially in spots where the vetch is thick, and the mowing is therefore rendered more difficult.

Where hairy vetch is planted alone, it nearly always becomes more or less lodged, and should be mowed, if possible, against the direction in which most of it is lying. After cutting the first swath, it should be rolled upon the uncut vetch before cutting the second swath. The two swaths should then be rolled out clear from the uncut vetch. Sometimes three swaths are combined in this way. The cut vetch should not be handled more than is necessary in curing, and care should be taken in shocking to cover the pods as much as possible. Hay caps are very desirable for this purpose. In thrashing pure vetch it is sometimes desirable to have sharpened teeth on the concaves, as long vetch is inclined to wrap about the cylinder.

If hairy vetch is pastured rather late, the subsequent growth will not be tall, but often is heavily set with pods. The same result can be obtained by cutting the vetch early and feeding it green or putting it into a silo. Such a second crop is much more easily mowed than tall vetch, and in some instances excellent seed crops have been thus secured.

Some farmers obtain their own supply of seed by cutting hairy vetch for hay rather late, i. e., after some of the pods have ripened. Much of this seed will rattle to the bottom of the mow, especially if a little care is taken to shake each forkful as it is being used for feed. Such late cutting reduces slightly the value of the hay, but the seed obtained often justifies the practice.

Hairy vetch ripens its pods over a period of two or three weeks. The best crops are obtained when the first pods are fully ripe and the upper pods well filled. The latter ripen in the shocks, and if carefully handled comparatively few of the ripe pods shatter. It is best to cut the crop early in the morning or on a cloudy day. In any event the vetch, whether cut in bundles or otherwise, should be put into shocks at once and left thus till thrashed. The most important rule is to handle the cut crop rapidly and as little as possible.

An incidental advantage to the use of locally grown hairy vetch seed is its much better germinating quality. Old seed has a large percentage of hard seeds, which lie in the ground a long time without sprouting and which are practically valueless to the farmer. Fresh samples collected in Europe in 1911 gave a uniformly high germination, only one testing below 91.5 per cent. Imported seed, which is usually 1 year old, frequently shows a hard-seed content of 10 to 40 per cent.

TABLE II.—*Data showing the results of American experiments in growing hairy vetch seed.*

Place.	Year.	Area.	Seeding.	Acre rate of seeding.	Date of seeding.	Total yield.	Acre yield (bushels).	Source of information.
Wayne County, Ohio	1903	4 acres	Broadcast	30–45 pounds vetch 30 pounds rye	Middle to end of September.	13 bushels vetch... 61 bushels rye	Vetch, 3.25 Rye, 15.25	Press Bulletin, Seed Laboratory, Bureau of Plant Industry, "Growing Hairy Vetch for Seed," 1903.
St. Marys County, Md.[1]	1903	do				18 bushels vetch... 8 bushels rye	Vetch, 4.5 Rye, 2	Do.
Agricultural College, Miss.	1899	Small plat	Drills 2½ ft. apart.	83 pounds			5.57	Annual Report, Mississippi Agricultural Experiment Station, 1899, p. 12.
		do	Rows 2½ ft. apart.	37 pounds			5.85	
		do	Broadcast	53 pounds			7.40	
Arkansas Valley, Colo.	1899	⅛ acre			Aug. 11	400 pounds	7.7	Bulletin 68, Colorado Agricultural College.
Pullman, Wash.	1898	2 acres		3 pecks			5.5	Bulletin 41, Washington Agricultural Experiment Station.
Do	1899	¾ acre					14.7	
James River Valley, S. Dak.	1898	Small plat. (old seed).	Drilled	36 quarts			6.5	Bulletin 61, South Dakota Agricultural Experiment Station.
		Small plat. (new seed).	do	do			6.5	
Guelph, Ont.	1901	Small plat			Autumn		8	Report, Ontario Agricultural College, 1901.
Do	1903				do		10.8[2]	Idem, 1903.
Do	1905				do		8.6[3]	Bulletin 140, Ontario Agricultural College, 1905.
Forest Grove, Oreg.	1906	2 acres	Sown with oats.			480 pounds vetch.. 900 pounds oats	Vetch, 4 Oats, 28	Cooperative experiment, Bureau of Plant Industry.
Pullman, Wash.	1908	1/10 acre				19.5 pounds	3.5	Forage-Crop Investigations, Bureau of Plant Industry.
Monmouth, Oreg.	1906	2 acres	Sown with oats.	50 pounds vetch... 1 bushel oats	Fall		Vetch, 10 Oats, 20	Letter of William Riddell & Sons,[4] February 1, 1907.
Hale, Mich.	1911	26 acres	Sown with rye.			20 pounds vetch... 230 pounds rye	Vetch, 7 Rye, 8.85	Cooperative experiment, Bureau of Plant Industry.
Marquette County, Wis.	1909	1 acre	do	30 pounds vetch... 30 pounds rye	Aug. 20		Vetch, 3 Rye, 9	
Do.[5]	1910	do		30 pounds rye... Volunteer vetch...	Late summer or fall.	18 bushels of the mixture.	Vetch, 5.4 Rye, 12.6	
York County, Va.	1910	8 acres (poor sandy loam).	Sown with rye.		August	100 bushels; half rye, half vetch.	Vetch, 6.25 Rye, 6.25	J. A. Bechtel, York County, Va., in letter to the Southern Planter, July, 1912, p. 764.
Arlington Farm, Va.	1912	1⅛ acres	Broadcast	40 pounds vetch... 30 pounds rye	Sept. 20	538 pounds vetch.. 4.8 bushels rye	Vetch, 7.5 Rye, 4	Seed Laboratory experiment.
Do	1912	3½ acres	do	30 pounds vetch... 45 pounds rye		677 pounds vetch.. 3,656 pounds rye	Vetch, 3.2 Rye, 17.4	

[1] This crop was much injured by storms and the yield considerably lessened.
[2] Average of 3 years.
[3] Average of 4 years.
[4] This firm also grew hairy vetch seed in 1907, 1908, and 1909, but the yields were not so good as in 1906. In 1910 the vetch yield was 3 bushels to the acre.
[5] Crop of 1910 was on the same ground as that of 1909; the only seed sown was 30 pounds of rye, a thick crop of the vetch appearing from the shattered seed.

EXPERIMENTS IN GROWING HAIRY VETCH SEED IN AMERICA.

While hairy vetch for hay or green manure has long been grown successfully in nearly all parts of the United States and Canada, there has been relatively little investigation made of its seed production. Table II is a compilation of published American data in seed production, together with unpublished results obtained by the Department and its cooperators.

These results show yields ranging from 3 to 15 bushels per acre, with an average of 6½ bushels for all the trials. Such a yield makes a decidedly profitable crop. Where vetch is grown alone the seed yields are heavier, but this is largely counterbalanced by the difficulty of harvesting, so that it is advisable as a rule to grow it in combination with rye.

Approved:

JAMES WILSON,
Secretary of Agriculture.

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