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AGRICULTURAL EXPERIMENT STATION

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FIRST ANNUAL SEED LABORATORY REPORT 1913-1914

BY

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DIVISION OF PLANT PATHOLOGY AND BOTANY

UNIVERSITY FARM, ST. PAUL
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AGRICULTURAL EXPERIMENT STATION

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LETTER OF TRANSMITTAL

Minneapolis, Minn., July 31, 1914

To His Excellency, Adolph O. Eberhart,
Governor of Minnesota.

Sir:

I have the honor to transmit to you herewith the first annual report of the Seed Laboratory of the Minnesota Agricultural Experiment Station for the year ending July 31, 1914. The report is prepared in accordance with the requirements of Chapter 141, H. F. 95, General Laws of Minnesota for 1913, entitled, "An Act to Regulate the Selling, Offering or Exposing for Sale, of Agricultural Seeds in this State and Providing Penalties for Violating the Same." The report will be published as a bulletin of the Agricultural Experiment Station.

Respectfully,

GEORGE E. VINCENT,
President of the University of Minnesota

FIRST ANNUAL SEED LABORATORY REPORT 1913-1914

By W. L. Oswald

INTRODUCTION

The importance of good seed has long been recognized, but only within recent years has legislative action been taken to improve conditions in some of the states. The last session of the Minnesota Legislature passed a seed law (Minnesota Laws, 1913, Chapter 141) which was intended to improve the quality of seed grain sold in the State. and thereby materially to increase both the quality and the yield of Minnesota crops. The administration of the law was intrusted to the Minnesota Agricultural Experiment Station, and this is a report of the work done between July 1, 1913 (when the law went into effect) and May 15, 1914.

The interest taken in the pure seed propaganda, as promoted by the law during the first year of its enforcement, has been exceedingly gratifying. Nearly 6,000 samples were voluntarily sent in for testing and 296 written inquiries concerning the new seed law have been received, with the addition of 141 inquiries pertaining to the weed-seed collections which are prepared at this Laboratory. Nearly 500 plants, mostly weeds, were determined for residents of the State, and almost as many weed seeds. Inspection work as provided for by the law was started, and 382 official samples were collected during the year.

This report does not discuss methods of testing used in the Seed Laboratory. These methods are described in the previous report, Minnesota Agricultural Experiment Station Bulletin No. 127. The Laboratory is striving to have uniform methods of testing adopted by all who are engaged in or interested in the testing of seeds within the State as well as by those who are officially or unofficially concerned outside of the State. Unless such methods are adopted, uniform results cannot be obtained.

MINNESOTA SEED LAW

The law has been interpreted as an educational law. It does not prohibit the sale of any kind of seeds within the State; it does, however, provide that seeds must be labeled, so that one may know just what kind of seed he is buying. The law is fully described in Agricultural Extension Bulletin No. 39, copies of which may be obtained

by addressing the Office of Publications, University Farm, St. Paul. Following are a few of the important points of the law:

SEEDS TO BE LABELED

The following seeds when sold for seeding purposes in the State, in lots of one pound or more, must be labeled: Red clover, white clover, alsike clover, alfalfa, timothy, Kentucky blue grass, brome grass, orchard grass, redtop, meadow fescue, rye grass, and other grasses and forage plants; corn, flax, rape, rye, wheat, oats, barley, buckwheat, and other cereals.

THE LABEL

The label must be on the outside of the container, and must be printed or written in the English language, in type no smaller than the following words:

EIGHT-POINT HEAVY GOTHIC CAPITALS

The label must show:

(a) The commonly accepted name of seed sold. The name of the strain or variety need not be placed on the label, but if it is it must be the true name of such strain or variety.

(b) The approximate percentage of germination, and date of test.

(c) Approximate percentage by weight of each of the following seeds if they are present: Canada thistle, dodder, quack grass, and perennial sow thistle.

(d) Approximate percentage by weight of pure seed.

(e) If grown in the State, the words "Grown in Minnesota," and in case of corn, the county in which grown. If imported into this State, the name of the country or state from which imported.

(f) The name and address of the seller of the seed.

EXCEPTIONS TO REGULAR LABEL

A complete label is not necessary, and a label "Not Cleaned Seed" may be attached:

(a) When seeds are sold to be cleaned or graded before being offered for sale for the purpose of seeding.

(b) When seeds are held or sold for exporting outside the State only. In lawn-grass mixtures it is not necessary to name the seeds in the mixture or the place from which the seeds were imported.

PENALTY

The law provides that for the first violation there shall be a fine of not less than $10 or more than $100, and for the second or any subsequent offense of not less than $100 or more than $500.

SEED LABORATORY ESTABLISHED

The law provides for the establishment of a Seed Laboratory at the Minnesota Experiment Station, where any citizen of the State may have seeds tested free of charge. Transportation charges must be prepaid.

Inspection duties are placed under the jurisdiction of the Minnesota Experiment Station. Those in charge are given authority to inspect any seed sold in the State for seeding purposes.

The work of the Laboratory is divided into four parts: (1) educational, (2) experimental, (3) actual seed-testing, (4) seed inspection.

EDUCATIONAL

The educational side of the work has been greatly emphasized. Such an emphasis was accepted as the intent of the law. It is probably impossible to legislate good seed into the State, and bad seed out of it. Drastic legislation without educational policies would be more fittingly delegated to purely administrative State departments and would probably fail to accomplish the aim in view unless supplemented by an educational campaign. The Minnesota seed law is based on educational principles, and will in time greatly improve the seed bought and sold in the State.

During the year it has been the policy of the Seed Laboratory to assist residents of Minnesota who buy and sell seed to become familiar with the seed law and its requirements. In this preliminary educational campaign the violations were found to be unintentional and due to misunderstandings in regard to the provisions of the law; when violators were informed they immediately complied with the requirements.

In March, 1913, immediately after the passage of the act, Agricultural Extension Bulletin No. 39, entitled "The Minnesota Seed Law" was published. The bulletin contained a copy of the law as it was passed, and its interpretation by those in charge. The bulletin also gave some information on sampling, sending in samples for testing, and inspection. This bulletin was sent to nearly 50,000 residents of the State. Copies are still available and may be obtained by addressing Office of Publications, University Farm, St. Paul.

In July, 1913, a week's short course in seed-testing was given at the Seed Laboratory. This course was open to all who wished an opportunity to study the Minnesota Seed Law, and to learn the methods of seed-testing. Nearly every seed company in the State sent representatives. The purpose of a course of this kind is that the methods of seed-testing in the State may become more nearly uniform. Short courses will be given from time to time so that any one inter-

ested in seed-testing may become acquainted with the proper methods. Courses in seed-testing are also given in both the College and School of Agriculture, in the Farmers' Short Course, and by lectures and demonstrations at other short courses and conventions in the State.

In September, 1913, a circular entitled "Minnesota Seed Law" was furnished to the seed companies in order that they might send them to their retail customers. This circular gave a summary of the law, followed by discussions of its applications, under the following titles: The law and the farmer; The law and the large seed dealer; The law and the small seed dealer; The law and the seed laboratory. Nearly 15,000 of these circulars were distributed. Circulars were also sent to the farmers' clubs, county agents, agricultural high school instructors, members of the crop improvement association, elevator men, and the retail seed dealers of the State.

Articles were written for the different papers in the State explaining the law, and many farmers' clubs were addressed by representatives from the Seed Laboratory.

The Seed Laboratory is still preparing weed-seed collections which are sold at a nominal sum. These collections are a valuable and cheap method of enabling farmers to recognize the common weed seeds found in the State. At present, three series each containing 24 different kinds of weed seeds are being used. The fourth case is being completed and will soon be ready for distribution. Nearly 600 cases were distributed during the year. This is a large increase over previous years, and shows that great interest is being taken along the line of pure seed. Many collections were sold outside the State.

During the year a second weed bulletin was published. This bulletin describes the twenty-four weeds whose seeds appear in the weed seed case No. 2. The bulletin is entitled "Minnesota Weeds, Series II."

This educational work is of the highest value. More interest is being taken in pure seed, seed-testing, and weeds, on account of it, as the value of good seeds is more generally realized. If this campaign is continued, there will eventually be no market for seed of low quality in this State.

EXPERIMENTAL

Every seed laboratory needs to carry on lines of experimentation. The specialist in the seed laboratory has many problems that confront him which can be solved only by experimental study.

One line of investigational work that has been followed during the year is the study of the seeds of the different *Agropyrons* (wheat grasses). Heretofore it has been impossible to determine absolutely the differences existing between the single seeds of *Agropyron repens*

(quack grass), *Agropyron tenerum* (slender wheat grass), and *Agropyron smithii* (western wheat grass). This was a serious drawback in the Laboratory. Since quack grass is a very pernicious weed, and slender wheat grass (often called western rye grass) is a very good forage grass, the value of easily distinguishing between these seeds can readily be seen. The differences have been successfully worked out and described in a technical paper.[1] The commercial value of this work cannot be overestimated.

One of the means of distributing weed seeds on the farm is through the manure which is scattered on the land. Work has been started to determine which weed seeds will pass through the digestive tracts of the different animals and still retain their vitality; also the effect of composting manure on their vitality.

The Laboratory also intends to make a study of the seeds of medium and mammoth red clover, and to try to discover some methods of distinguishing these seeds. If this can be done it will be of great commercial importance.

Through an experiment carried on for several years, it is hoped to determine how long the different crop and vegetable seeds will retain their vitality when kept under normal storage conditions.

The testing of seeds for germination affords many problems for experimental work. The testing of some grass and vegetable seeds is still open to improvement and it is hoped that such results will be obtained as will lead to laboratory methods which will give the best possible germination test of such seeds and the relation between this germination test and ordinary field conditions.

SEED-TESTING

The Seed Laboratory devotes most of its time during the year to actual seed-testing work. Nearly 6,000 seed samples, voluntarily sent in, and about 400 official samples collected by the inspector were tested during the year. Most of the samples were tested for both purity and germination. Figure 1 shows the number of samples that were received at the laboratory during each month of the year. Figures 2 and 3 show when samples of different kinds were sent in for testing and the number sent each month. It will be seen that in nearly every case the largest number of samples were sent in during the month of March.

Many seed companies have availed themselves of the opportunity of having their seeds tested. Some companies have established their own seed-testing laboratories and send to the State Laboratory only such samples as show doubtful results in their own laboratory. Many

[1] Dahlberg, R. C. The Seeds of Agropyrons. Jour. Agr. Research, Dec. 1914.

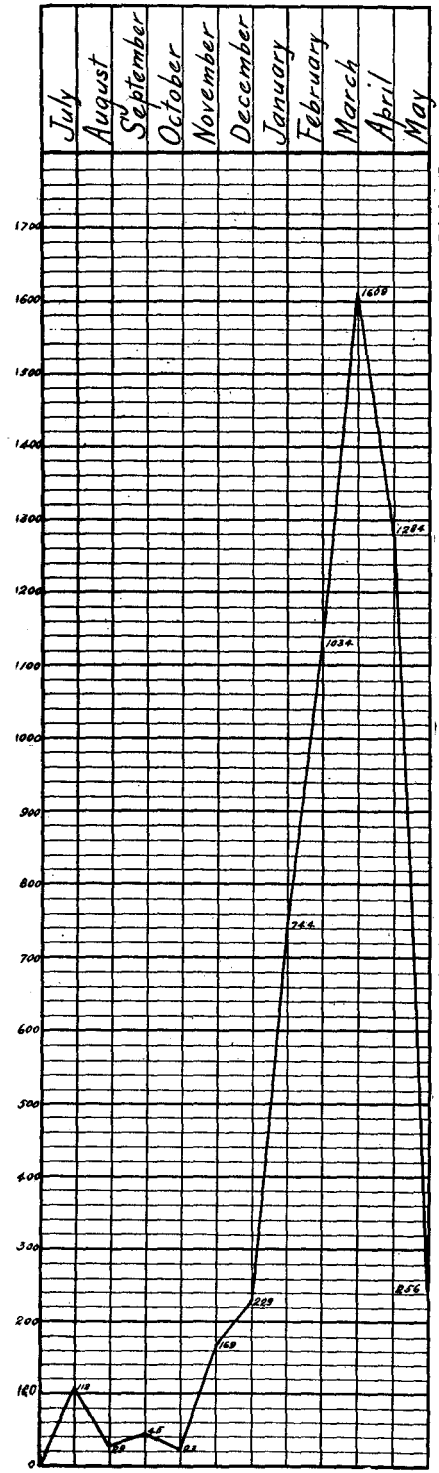

Fig. 1. Dates When Samples Were Received

Fig. 2. Dates When Samples of Red Clover, Alfalfa, Timothy, and Corn Were Received

of the seed analysts from these companies have visited the State Laboratory from time to time, and as far as possible are using the same methods as those employed there. This of course will eventually lead to more uniform results. It is also gratifying to note that many companies are equipping themselves with seed-testing apparatus of a high standard. Many vegetable seeds also were sent in for testing, although the labeling of vegetable seeds is not required by the law. When companies begin testing all of their seeds, regardless of whether or not they are required to do so, the quality of seed sold by reliable companies will be greatly improved.

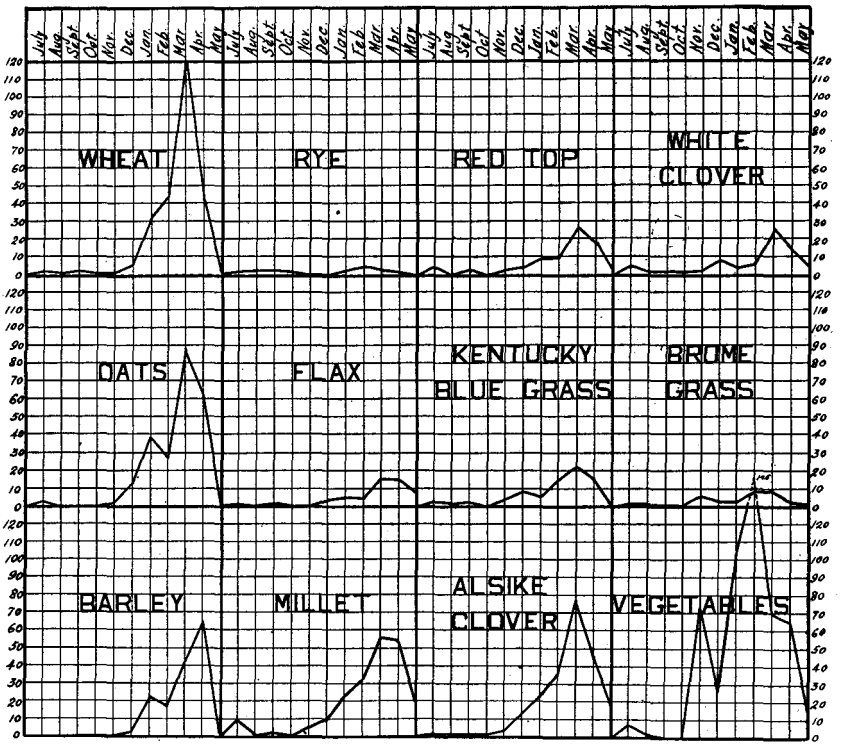

Fig. 3. Dates When Samples Named Were Received

SOURCE OF SAMPLES

The samples obtained for testing came from three different sources: (1) farmers, (2) seed merchants, and (3) inspection. Those in the first two classes were voluntarily sent to the Laboratory, while the inspection samples were collected by a representative of the Seed Laboratory. Figure 4 shows the number of samples and their source. In studying the map, it will be seen that nearly every county in the State sent in at least a few samples, while some sent in 500 or more.

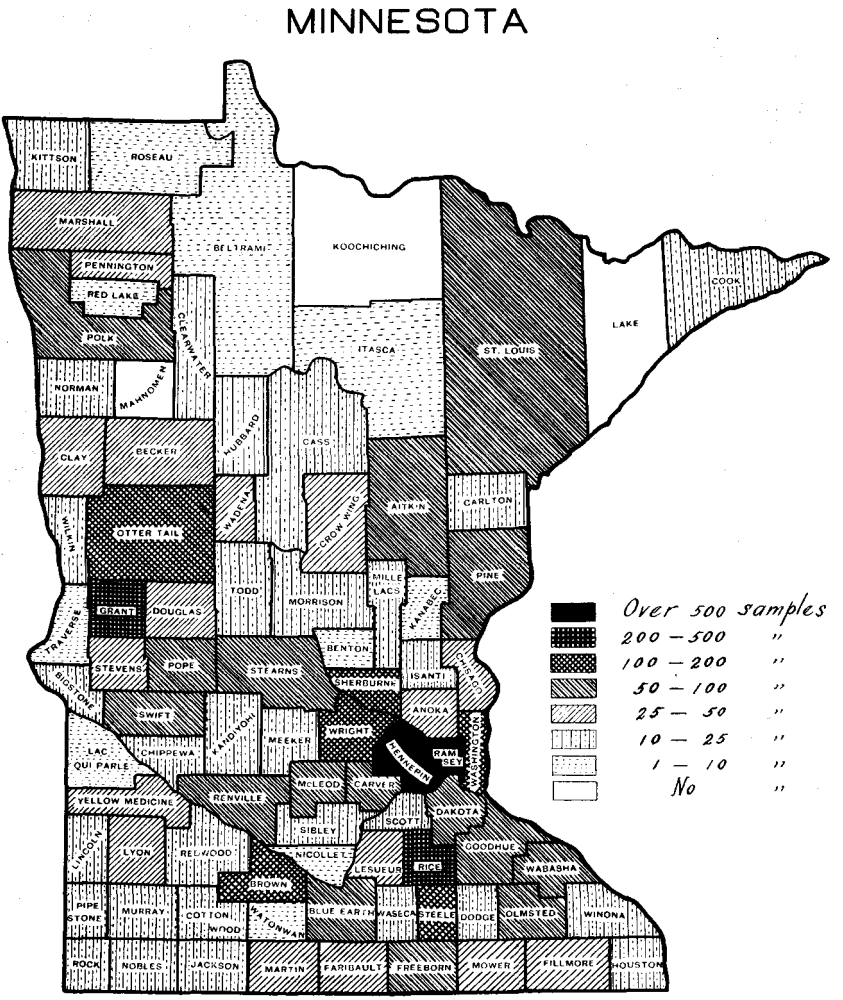

Fig. 4. Source and Number of Seed Samples Sent in by Each County

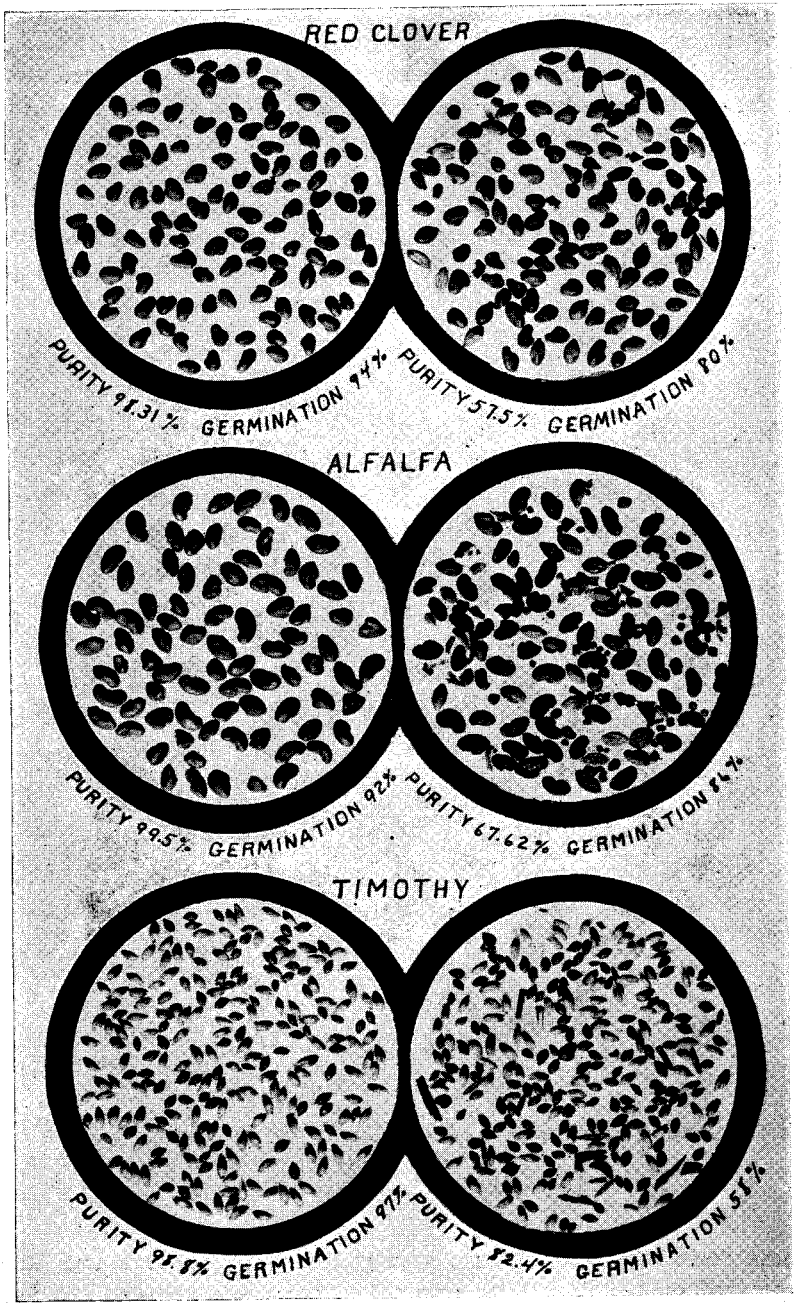

Fig. 5. Samples of Seed Sent in to the Seed Laboratory. Good and Poor Quality Shown

In many counties a large number of samples were collected and sent in by county agents and high school instructors in agriculture. One noticeable fact is that a large number of farmers send in samples of all the seed they intend to sow each year. They are realizing more and more that it pays to have their seed tested before planting.

TESTS FOR PURITY

During the year 3,261 samples were tested for purity. This represents an increase over the number tested in previous years.

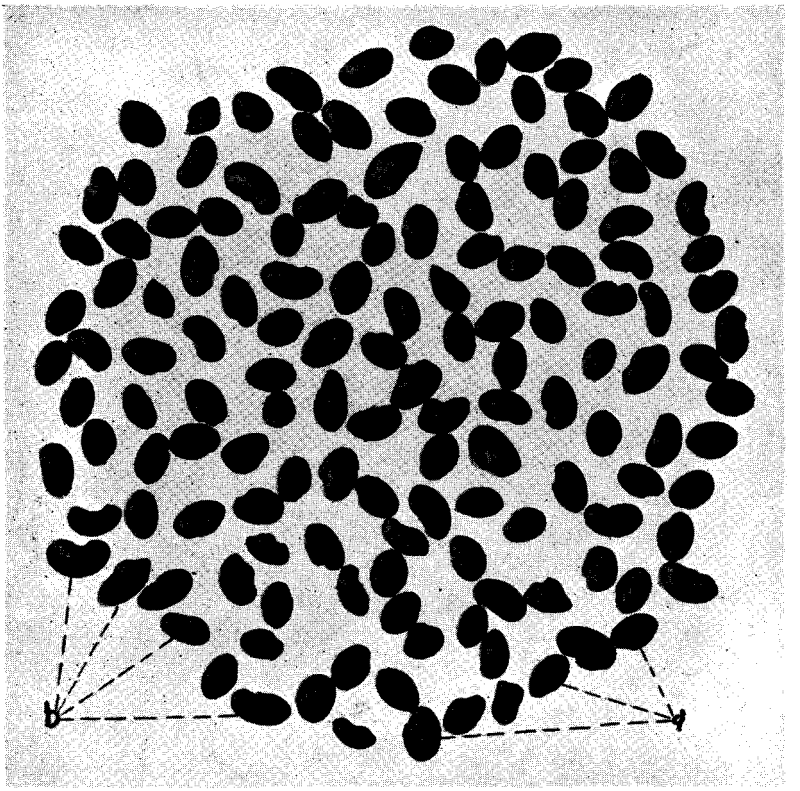

Fig. 6. Sample of Seed Sent in as Sweet Clover. A Test Showed 62.8 Per Cent Alfalfa Seed
a. Seeds of sweet clover
b. Seeds of alfalfa

These tests have undoubtedly greatly aided the farmers and other buyers of seed. They have also proved of great value to the Seed Laboratory in that they give information regarding the distribution of the different weeds in different localities. Through the examination of the impurities of the different seeds, weed seeds which were

never before found in this State were discovered in Minnesota-grown seed. Figure 5 shows some of the samples and Figure 6 a sample of sweet clover seed which were sent to the Laboratory for testing. Figure 6 shows an uncommon adulteration. Upon making a purity test it was found that 62.8 per cent of the sample was alfalfa. This adulteration was due to the fact that the price of sweet clover seed was nearly double that of alfalfa. In former years, before sweet clover was considered a good forage plant, alfalfa seed was commonly adulterated with the seed of the sweet clover.

TABLE I.—SUMMARY OF PURITY TESTS FOR 1913-1914, SHOWING COMPARISON WITH UNITED STATES STANDARDS

Name of Seed	Samples	Average Purity	U. S. Standard of Purity*	Samples above Standard	Samples below Standard
	Number	Per Cent	Per Cent	Number	Number
Alfalfa	550	97.11	98	407	143
Barley	84	97.86	99	55	29
Blue grass, Canada	6	89.00	90	3	3
Blue grass, Kentucky	74	92.17	90	51	23
Brome grass	37	87.64	90	19	18
Buckwheat	15	97.13	99	11	4
Clover, Alsike	205	89.50	95	94	111
Clover, crimson	4	98.40	98	3	1
Clover, red	1,010	94.08	98	394	616
Clover, sweet	29	92.70	†	.....	.....
Clover, white	68	92.32	95	38	30
Flax	56	96.86	†	.....	.....
Millet	195	94.95	99	62	133
Oats	180	97.48	99	109	71
Redtop	78	82.67	†	.....	.....
Rye	15	96.75	99	4	11
Timothy	709	96.84	98	450	259
Wheat	222	98.62	99	171	51

*From U. S. Dept. of Agr. Yearbook, 1896.
†No standards given.

Table I gives a summary of the general results of the purity tests in comparison with United States standards. From the table it may be seen that the largest number of samples (1,010) were red clover, timothy was second (709 samples), and alfalfa third (550 samples). It is interesting to note that in red clover, alsike, millet, and rye the number of samples below standard was greater than those above.

Table II shows the ten most common weed seeds found in order of their occurrence. A noticeable fact is that Canada thistle and perennial sow thistle do not appear in this list. Quack grass was found to be the most common impurity in brome grass seed, and fourth on the list in rye; dodder was sixth on the list in alfalfa, and eighth in crimson clover. Wild oats appeared among the ten most common weed

TABLE II.—TEN WEED SEEDS MOST COMMONLY FOUND IN DIFFERENT CROP SEEDS

In the Order of Their Occurrence

Crop	No. of Samples	1	2	3	4	5	6	7	8	9	10
Alfalfa.....	550	Russian thistle	Green foxtail	Lamb's quarters	Gumweed	Pigweed	Dodder	Ragweed	Yellow foxtail	Barnyard grass	Curled dock
Alsike clover..	205	Sheep sorrel	Lamb's quarters	Green foxtail	Cinquefoil	Peppergrass	Pigweed	Evening primrose	Night-flowering catchfly	Curled dock	Plantain
Barley.....	84	Wild buckwheat	Wild oats	Lamb's quarters	Green foxtail	Yellow foxtail	Vetch	Mustard	Lady's thumb	Wood sage	Peppergrass
Brome grass..	37	Quack grass	Wild buckwheat	Green foxtail	Western wheat grass	Lamb's quarters	Slender wheat grass	Wild oats	Mustard	Yellow foxtail	Wild rose
Crimson clover	4	Mustard	Sheep sorrel	Curled dock	Buckhorn plantain	Night-flowering catchfly	Crane's bill	Buckhorn plantain	Dodder	Green foxtail	Yellow foxtail
Flax.....	56	Lamb's quarters	Lady's thumb	Green foxtail	Yellow foxtail	Wild buckwheat	False flax	Barnyard grass	Large-seeded false flax	Pigweed	Mustard
Kentucky blue grass.....	74	Sedge	Peppergrass	Sheep sorrel	Shepherd's purse	Curled dock	Sleepy catchfly	Mouse-ear chickweed	Night-flowering catchfly	Cinquefoil	Pigweed
Millet.....	195	Green foxtail	Yellow foxtail	Lamb's quarters	Pigweed	Lady's thumb	Ragweed	Barnyard grass	Tickle grass	Mustard	Wild buckwheat
Oats.....	180	Wild buckwheat	Wild oats	Lamb's quarters	Green foxtail	Yellow foxtail	Corn cockle	Lady's thumb	Vetch	Mustard	Night-flowering catchfly
Rape.....	44	Cleavers	Vetch	Mustard	Yellow foxtail	Common hemp nettle	White bed straw	Sheep sorrel	Wild buckwheat	Buckhorn plantain	Night-fing catchfly
Red clover...	1,010	Green foxtail	Lamb's quarters	Lady's thumb	Ragweed	Yellow foxtail	Small crab grass	Pigweed	Night-flowering catchfly	Barnyard grass	Black-seeded plantain
Redtop.....	78	Yarrow	Cinquefoil	Black-seeded plantain	Sedge	Peppergrass	Brown-eyed Susan	Slender rush	Mouse-ear chickweed	Sticktight	Mountain mint
Rye	15	Wild buckwheat	Wild oats	Corn cockle	Quack grass	Lamb's quarters	Lady's thumb	Green foxtail	Yellow foxtail	Vetch	Cow cockle
Sweet clover..	29	Mustard	Lamb's quarters	Green foxtail	Curled dock	Buckhorn plantain	Gumweed	Smartweed	Russian thistle	Yellow trefoil	Lady's thumb
Timothy.....	709	Peppergrass	Lamb's quarters	Cinquefoil	Green foxtail	Evening primrose	Pigweed	Sheep sorrel	Night-flowering catchfly	Sedge	Wood sage
Wheat.....	222	Wild buckwheat	Lamb's quarters	Wild oats	Green foxtail	Corn cockle	Yellow foxtail	Mustard	Vetch	Lady's thumb	Wild rose
White clover..	68	Sheep sorrel	Buckhorn plantain	Yellow trefoil	Lamb's quarters	Corn chamomile	Chickweed	Night-flowering catchfly	Heal-all	Green foxtail	Common plantain

seeds in barley, brome grass, oats, rye, and wheat. Mustard was found most commonly in barley, brome grass, crimson clover, flax, millet, oats, rape, sweet clover, and wheat. It is interesting to note the large number of times that lambs' quarters and green foxtail appear in the table.

TESTS FOR GERMINATION

The number of germination tests made during the year shows an exceedingly large increase over previous years. The germination apparatus was increased to five times its capacity of previous years and even then during the busiest season all the germinators were taxed to their full capacity. Great care was taken to bring about as accurate results as possible in these tests. Duplicate tests were always made, and when they showed a variation of over ten per cent re-tests were made. In many cases the chamber tests were compared with soil tests, and it was found that the variation was slight. It is planned in the future to install some "light" germinators especially for making tests of many of the forage-grass seed which are more or less difficult to germinate accurately in "dark" chambers. The results of the germination work during the year will be found summarized in Tables III, IV, and V.

TABLE III.—GERMINATION TESTS OF ALFALFA AND CLOVERS, 1913-1914

Name of Seed	Samples	Average Germination	Hard Seeds	U. S. Standard of Germination*	Samples above Standard	Samples below Standard
	Number	Per Cent	Per Cent	Per Cent	Number	Number
Alfalfa.....	582	76.35	18.80	85–90	176	406
Alsike clover..	215	81.98	13.01	75–80	171	44
Red clover...	1,027	81.22	11.88	85–90	453	574
Sweet clover..	51	55.56	36.19	†		
White clover..	70	76.62	14.04	75–80	46	24

*From U. S. Dept. of Agr. Yearbook, 1896.
†No standard given.

Table III gives the results of the germination tests of alfalfa and the different clovers, and compares them with United States standards of germination. It will be noticed that both alfalfa and red clover averaged below the normal standard, while alsike and white clover averaged above. During the year 51 samples of sweet clover were tested for germination. The average of these seeds showed a much larger percentage of "hard seeds" than was found in alfalfa or any of the clovers.

Table IV is a compilation of the results of germination tests of the grain and grass seeds, and compares the same with United States

standards of germination. It will be noticed that in nearly every case the tests averaged above the standards given.

TABLE IV.—GERMINATION TESTS OF GRAIN AND GRASS SEEDS, 1913-1914

Name of Seed	Samples	Average Germination	U. S. Standard of Germination*	Samples above Standard	Samples below Standard
	Number	Per Cent	Per Cent	Number	Number
Barley	102	91.20	90–95	81	21
Blue grass, Canadian	7	51.57	45–50	5	2
Blue grass, Kentucky	67	50.41	45–50	46	21
Brome grass	34	75.08	75–80	24	10
Buckwheat	20	89.50	90–95	14	6
Corn, field	638	86.92	90–95	369	269
Cow peas	2	79.00	85–90	1	1
Fescue, meadow	12	70.00	85–90	4	8
Flax	56	91.89	85–90	50	6
Millet	200	78.78	85–90	103	97
Oats	227	89.82	90–95	156	71
Orchard grass	15	27.33	†		
Rape	43	89.90	90–95	27	16
Redtop	79	74.17	†		
Rye	17	85.41	90–95	9	8
Rye grass, Italian	6	74.00	†		
Rye grass, perennial	14	71.21	†		
Rye grass, western	7	82.00	†		
Sorghum	10	67.80	85–90	5	5
Speltz	11	85.09	†		
Timothy	725	93.35	85–90	632	93
Vetch, spring	8	75.50	†		
Vetch, winter	6	72.00	†		
Wheat	241	92.20	90–95	191	50

*From U. S. Dept. of Agr. Yearbook, 1896.
†No standards given.

Table V gives the results of the germination tests of the different vegetable seeds which were tested during the year and compares them with United States standards. The germination standards of many of these seeds have not been worked out, but the average showed a decided percentage below standard. This is partly due to the fact that many seed companies send in only the samples which fail to germinate well in their own laboratories.

SEED INSPECTION

The matter of inspection this year has taken on an educational aspect. To carry on an exhaustive system of inspection, one which could cover all seed sold in the State for seeding purposes, would involve an expenditure far greater than the appropriation made for the work. During the past year one inspector was appointed. He visited all the large seed houses in the State at least once, and as far as possible inspected retail seed establishments and grain elevators.

The inspector could not possibly visit all the retailers of seed. Besides the regular routes, he visited places from which complaints came. During the year 382 samples were officially collected, examined, and reported on.

Owing to the fact that the law was not understood by many it was thought best not to publish the names of persons or firms from

TABLE V.—GERMINATION TESTS OF VEGETABLE SEEDS, 1913-1914

Kind of Seed	Samples	Average Germination	U. S. Standard of Germination*	Samples above Standard	Samples below Standard
	Number	Per Cent	Per Cent	Number	Number
Asparagus	4	58.75	80–85	2	2
Beans	36	81.27	90–95	18	18
Beets	45	66.15	†		
Cabbage	16	74.18	90–95	3	13
Carrots	30	58.83	80–85	2	28
Celery	19	57.84	60–65	12	7
Corn (sweet)	45	81.48	85–90	32	13
Cress	1	17.00	85–90	0	1
Cucumber	18	81.38	85–90	9	9
Dill	4	45.75	†		
Egg plant	4	63.50	75–80	1	3
Endive	1	85.00	†		
Gourd	1	87.00	†		
Ground cherry	4	54.75	†		
Kohlrabi	1	36.00	†		
Lettuce	21	77.85	85–90	11	10
Mangles	36	56.13	†		
Muskmelon	30	72.80	85–90	5	25
Okra	3	54.66	80–85	0	3
Onion	72	76.27	80–85	45	27
Parsley	23	45.17	70–75	9	14
Parsnip	4	31.75	70–75	0	4
Peas (field)	49	31.06	93–98	7	42
Pepper	7	54.00	†		
Popcorn	6	74.83	†		
Pumpkin	10	71.00	85–90	4	6
Radish	13	74.69	90–95	5	8
Rhubarb	2	54.00	†		
Rutabaga	10	81.00	†		
Sage	3	69.33	†		
Salsify	1	71.00	75–80	0	1
Savory	1	31.00	†		
Spinach	27	47.37	80–85	0	27
Squash	12	68.91	85–90	1	11
Thyme	2	28.00	†		
Tomato	20	67.25	85–90	1	19
Turnip	8	89.00	90–95	5	3
Watermelon	20	75.90	85–90	5	15

*From U. S. Dept. of Agr. Yearbook, 1896.
†No standards given.

whom these samples were collected. In future reports, however, the names will be published so that the public may see from whom the samples were collected. On careful examination of Table VI it will

be seen that there were some violations of the law. In nearly every case the label which represented the violation was the one attached to the seed as it was first offered for sale. After the inspection the seed was properly labeled before it was sold. This improper labeling was due to the fact that many were not familiar with the provisions of the law until the inspector had informed them of these provisions and requirements, and as soon as they could get correct information from the Seed Laboratory, the label in all cases was immediately corrected. Many of the small retailers used the label under which the seed was sold to them. The information on these labels was not always correct. Some samples were not labeled at all. In nearly all of these cases the omission of the label was due to ignorance of the law. After inspection the seed was properly labeled. The "uncleaned seed" label was sometimes attached to the seed, but not to any great extent, as buyers did not care to purchase seed labeled in this manner.

TABLE VI.—INSPECTION SAMPLES,* 1913-1914

Kind of Seed	Samples Collected	Samples with Correct, Complete Label	Samples with "Uncleaned Seed" Label	Samples with Incorrect Label	Samples not Labeled
	Number	Number	Number	Number	Number
Alfalfa	104	72	2	25†	5
Barley	2	1	.....	.....	1
Blue grass	16	5	9	.....	2
Brome grass	4	1	1	1	1
Buckwheat	1	1	.....	.....	.....
Clover, alsike	19	11	.....	3	5
Clover, crimson	2	.....	2	.....	.....
Clover, red	64	35	11	1	17
Clover, sweet	8	3	2	1	2
Corn	29	16	4	.....	9
Flax	7	5	.....	.....	2
Lawn grass	24	10	4	.....	10
Meadow fescue	2	.....	1	.....	1
Millet	13	6	2	.....	5
Mixtures	7	4	2	.....	1
Oats	10	5	3	1	1
Orchard grass	1	.....	1	.....	.....
Rape	10	7	2	.....	1
Redtop	3	2	1	.....	.....
Rye grass	1	1	.....	.....	.....
Timothy	39	13	10	3	13
Wheat	16	13	.....	.....	3
Totals	382	211	57	35	79

*Table VI shows the inspection samples of seed offered for sale. The large percentage (approximately 30 per cent) of violations was due in nearly every case to ignorance of the law. This is shown particularly in the large number of unlabeled samples. In those samples incorrectly labeled the error was due in practically every case to the presence of a "trace" of noxious weed seeds. The purity and germination percentages were in all cases approximately correct. As far as known the corrected label as furnished by the Seed Laboratory was attached to the seed before the latter was actually sold.

†These 25 samples were all from one lot of a large number of bags and a very faint trace of dodder was found. The labels were corrected before the actual sale of the seed and the Seed Laboratory has followed up the seed in many fields but failed to find any dodder plants.