THE HISTORY AND ACTIVITIES OF CROP IMPROVEMENT ASSOCIATIONS OF THE UNITED STATES AND CANADA

Thesis for Degree of M. S.

Charles Boatner Anders

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HISTORY AND ACTIVITIES OF CROP IMPROVEMENT ASSOCIATIONS OF THE UNITED STATES AND CANADA, WITH COMMENTS ON THE STANDARDIZED SEED SITUATION

A Thesis Prepared by

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CONTENTS

THE HISTORY AND ACTIVITIES OF CROP IMPROVEMENT ASSOCIATIONS OF THE UNITED STATES AND CANADA, WITH COMMENTS ON THE PEDIGREED SEED SITUATION.

I FOREWORD.

It is the purpose of the writer, in this thesis, to review the history and summarize the activities of the various States and several organizations in the United States and Canada, that are contributing to the development, reproduction and dissemination if improved varieties and strains of agricultural seeds.

The subject is very broad in its scope, and the writer has been forced to omit a number of important details.

II INTRODUCTION

Since this discussion will center around the pure seed associations, and crop improvement associations, the first consideration should be: What is a pure seed or crop improvement association?

It is an organization of: breeders, growers, handlers and consumers of seed; allied with persons interested in improving general farm conditions, for the purpose of: a. developing, breeding, or finding crops and varieties of crops of a better quality than those commonly grown; b. reproducting the seed of these crops in commercial quantities; c. maintaining a system of records whereby their purity can be known; d. disseminating these seeds among growers in all localities where they are adapted.

These associations all differ materially in their organization, methods and standards, thus creating a need for a complete study of their activities. A knowledge of what other associations are doing would enable each association to adopt the better methods used by the others. Also, new associations are being formed and these should select the most efficient working plan. Students of the pure seed movement also need a condensed treatise covering the entire field.

The material for this thesis was obtained through conversation; and through correspondence with: Secretaries of associations, Agronomy Extension workers, Directors of Experiment Stations and from published pamphlets, circulars, seed lists, bulletins, etc. All of which have been freely quoted.

III. THE NEED OF ORGANIZED SEED IMPROVEMENT

The evolution of these organizations has come about through a constant and ever increasing need for better seed and an effort on the part of: government, officials, State Colleges of Agriculture and private individuals to supply better seed and to maintain their purity.

At this point, it is well to consider just what is "Crop Improvement" and what is meant by "Better Seed".

Crop Improvement may be considered as anything that results in: better quality, greater quantity per acre and increased net profit per farm. Other things being equal, the latter usually follows either one or both of the former.

There are many factors that enter into this improvement such as season, soil fertility, drainage, culture methods, handling methods, and seed. Much improvement can be brought about by more efficient handling of all these factors. Feeling that seed is the real foundation of plant life and probably the most important factor involved in production, the crop improvement associations and seed associations are devoting a major part of their attention to seed.

Rather (1) "The crops of hay, corn, oats, wheat, rye, beans and barley represent in Michigan an industry valued at nearly 150 million dollars. The seed factor alone, in the production of these crops, represents an investment of more than 7 million dollars annually".

The kind of seed used does not influence the other factors of production, and the use of improved seed offers the farmer the

greatest opportunity to improve the quantity and quality of his product and to increase his net profits. Every industry is interested in quality production. To bring this about on the farm, seed with hereditary good qualities is necessary.

Better seed are those that will produce the greatest quantity of a high quality, marketable, commodity with the least expenditure of labor and money on the part of the producer. They may be:

a. More adapted seed.

b. Superior strains of seed.

c. Clean seed.

d. Germinable seed.

e. Disease free seed.

f. Disease resistant varieties.

g. Seed true to variety name.

a. Adaptable seed - Many seed that are well developed, plump, bright and have high germinating qualities are not suited to the climatic conditions where they are sold. They may produce abundantly where grown and yet be entirely worthless under other unfavorable climatic conditions. Unless the origin and adaptability of seed is known or certified to by reliable persons, it is unsafe to buy them, especially those of such crops as alfalfa, red clover, corn and soy beans.

b. Superior strains of seed. That is, strains of seed which have been tested by a State or Grovernment Experiment Station, or an Association, and found to be superior to the ones ordinarily grown. This superiority may be in desirable growing habits, date of maturity, quality of grain, or yield of grain.

c. Clean seed. Seed containing mixtures of other grains or of undesirable varieties of the same grain cause loss. Many seed also contain noxious weed seeds that lower the value of the crop and infest the fields where planted. In some seed large quantities of inert material is found.

d. Germinable seed. Seed low in vitality cause poor stands and the resulting weedy and short crop. This low vitality is often caused by disease, and where such seed are planted fields may become infected.

e. Disease free seed. Diseases are often not visible nor shown by the vitality of the seed, and one must trust to the integrity of the dealer for this information.

f. Disease resistant seed. Many varieties have been bred for resistance to certain diseases, and the planting of such seed often means the difference between a profitable crop and a total loss. Here again the purchaser must depend on others for this important information.

g. Seed true to variety name. Millions of dollars worth of seed are planted annually that are either intentionally or otherwise falsely named, and planters are thereby led to plant large acreages to unknown varieties. They can have no means of knowing what they are getting unless they demand that seed be certified by some responsible agency.

These facts emphasize the need for, and the place of, seed certifying organizations or some dependable system of certification.

The value of seed is too great, for planters to neglect to make every effort to obtain the best available.

Throughout the history of man, he has constantly striven to guide nature and force improvements from her. We find him in the early stages, giving attention to seed and attempting to find better seed. It is only within the past century, however, that man has learned very much about the science of improving plants. Organized effort along this line has been developed only within the past twenty-five years.

Some of the early incidents leading to the present seed industry are:

In 1623 King James attempted to introduce mulberry plantings in Virginia for the purpose of establishing the silk worm industry.

In 1743 the British Parliament granted 600,000 dollars to promote the culture of indigo and other crops in America.

Under the presidenty of J. Q. Adams all United States Consuls were instructed to send rare seeds to Washington for distribution.

In 1836 H. L. Ellsworth, Commissioner of Patents of the United States Government, began a systematic distribution of improved seeds.

From 1839 to 1865 Congress appropriated $1,000 annually, for the work of Ellsworth and for the gathering of Agricultural statistics.

The Act creating the United States Department of Agriculture passed in 1864 provided that it should procure, propagate and distribute among the people, new and valuable seeds and plants.

This distribution service did a great deal of good for a few years. About 1890 it fell into politics and began to be very much

abused, Congressmen and Senators using the free seeds as a means by which they retained their popularity. In 1922, altho Congress cut the total appropriation for the Agricultural Department 2 million dollars, still they appropriated 360,000 dollars for this Free Seed service. It was for several years a farce, and in no way served its original purpose. After much pressure, it was discontinued in 1924.

At the present time the United States Department of Agriculture maintains a large staff of men working on the importation of new crops and varieties, breeding better strains and varieties and establishing the sections where the different crops and varieties are best adapted.

This work is also being carried on to a greater or lesser extent by each State. In addition, the pure seed organizations have usually been started and fostered by the State workers as a means whereby they could more effectively do crop improvement work.

In spite of all this activity, however, there still remains a crying need for a greater production of better seed, and more efficient methods for maintaining their purity.

In 1899 Pieters (2) said: "The United States early ceased to depend on Europe for its farm seed --- in 1841 a few clover seeds were exported to Canada and for many years the United States has produced enormous quantities of clover and grass seeds, and in some years exports have amounted tomillions of dollars".

Again in 1901 Pieters said: "It is a little over a hundred years since the United States has imported any considerable quantity of red clover seed. Today Europe looks to the American farmer for a large part of her supply of her agricultural seeds".

Records show, that in the year 1900 over 3 million dollars worth of clover and grass seeds were exported from the United States, with practically no importations.

These statements made in 1900 are not true today, for seed growing has undergone a complete reversal. Figures taken from the yearbooks of the U.S. Department of Agriculture show that during the latter part of the 19th century and the first five years of the 20th century the United States was exporting agricultural seeds in large quantities. About 1910 we find a change and imports increasing. During the war period imports continued to increase. Since 1919 the exports and imports are more nearly equal; however, in 1924 we imported over 14 million dollars worth of seed, and exported less then 3 million. It is surprising to note that over 8 million dollars of this was for clover seed, including 3 million for red clover and one and one-half million for alfalfa seed.

During the first six years of the present century, the United States exported 84 million pounds of clover seed, and imported a negligible amount. In contrast to this, during the period from 1919 to 1924 inclusive, we imported 194 million pounds and exported only 29 million. Most of this imported seed could have been produced in the United States at a profit to the growers.

The amount of unadapted seed planted in the United States shows a need for improved methods of handling. Of the large importations in the past six years, 68 million pounds was red clover seed. A vast majority of this was unadapted to the region in which it was planted.

Professor J. F. Cox of the Michigan State College, says: "In the past five years 12 million pounds of unadapted red clover seed was imported into the United States, taxing the farmers who planted it, 14 million dollars a year. In the same period 24 million pounds of Argentine alfalfa seed was imported, all of which went into sections where it was not adapted".

In addition to the importation of unadapted seed, there is, within the United States, an immense movement of seed from areas of production into regions where they are unadapted.

The need of organized effort has also been keenly felt by plant breeders, because of their inability to properly increase and distribute varieties after they have been developed.

Men are such victims of habit, that a change of ideas or seed comes not without a struggle. Introducting new varieties of any crop is, therefore, not an easy matter.

Within the past twenty five years, Plant Breeders all over the country have been developing or isolating strains of every important field crop; also, proving their superiority over those varieties commonly used. The potential value of these productions is inestimable; yet, in many instances, these masterpieces have been lost through the lake of a system or organization through which they could have been introduced to the public.

Spragg (4) quotes Bolling as saying: "Until we have control of seed grain production, we will continue to have mixed varieties, and the best ones will continue to be lost thogh carelessness. The work of each cereal crop improver and public educator or breeding dies with him". Spragg says: "Seed improvement must last through the life of

many men, and for this there must be plans based on established laws. Before any of these associations can work, some plant breeder must have spent years purifying old varieties of breeding new ones."

At first, plant breeders sent out small samples of their improved seed, accompanied by a description of their merit. These seed were usually consigned to the rubbish can for one or more of the following reasons: a. The reluctance with which any grower changes varieties; b. the more glowing and promising descriptions of other new varieties found in catalogues or told the grower by overzealous salesman; c. The small sample did not plant sufficient acreage to make it attractive for the grower to give it the special attention necessary to keep it pure, harvest separately, etc.

The next system tried and still practiced by some, is: to select growers who show interest and ability, and are equipped to handle the seed, and give them larger amounts of seed. Many varieties have been introduced into the trade through this system. Though successful in some instances, it is generally considered as haphazard and through it much good seed has been lost. This is due to the inability of the grower to keep the seed pure, lack of any arrangement to sell the seed for the grower, and his subsequent loss of interest.

The next system is used by a number of Experiment Stations at the present time. It is: to select a very few growers who are interested enough to buy the seed and have the proper intelligence and equipment to handle same, keep them pure and introduce them to his neighbors. To these men, seed are sold in sufficient quantities to enable them to handle the crop as a separate unit on the farm. This

enables them to prevent crossing, mixtures, etc., and creates in them the interest necessary on their part, to see that the seed are properly cared for. An example of this system of distribution is found in the method used by the Mississippi Experiment Station in distributing improved cotton seed.

This latter system materially increased the available supply of good seed, but it falsity is that there is no fallow-up organization to see that purity is maintained, certify it, and assist in selling the product. To maintain varieties under this system, the Station must continually produce pure parental stock, and see that it is put out. Few Stations are able to continue such service with very many crops, and thus varieties are lost unless taken up and maintained by private organizations.

Some breeders working individually or employed by commercial organizations introduce their own improvements, maintain purity and multiply their own seed. Many valuable strains have entered the trade through this source. Such practice by reputable men and firms is to be greatly desired. However, with these seed the purchaser needs some recognized system of certification or guarantee by which he is protected from fraudulent practice.

Thus we find a very great need for some form of organization having for its sole purpose: the taking of improved or better adapted seed from the hands of the breeders; providing a system for increasing the supply, maintaining the purity, distributing them for the grower, and guaranteeing them to the buyer.

IV. HISTORY AND ACTIVITIES OF VARIOUS ORGANIZATIONS.

CANADA.

The Canadian Seed Growers Association is probably the oldest association that is still active. In 1899 Dr. James W. Robertson, Commissioner of Agriculture at Ottawa, became keenly interested in the possibilities of improvement of grain by selection. He had studied the seed improvement systems of Europe, and had come to the conclusion that some better plan should be introducted into Canada. He, accordingly, offered 100 dollars of his personal money in prizes to Canadian boys and girls who would send him the largest heads from the most vigorous plants on their fathers' farms. The response he received caused Dr. Robertson to present the matter to his wealth friend Sr. William A. MacDonald of Montreal, Quebec. Sr. William became interested and provided 10,000 dollars to support the project for three years. Prizes were offered for the selections, for growing these on plats by themselves, and for re-selecting out of these isolated plats enough seed for larger plats another year. 1500 competitors participated in this contest, 450 of whom satisfactorily carried the work for the three years. On the average the boys and girls got 40% more crop on their wheat plats the third year than they got the first year, and 36% more oats.

This success lead to the formation of an association, in order to give the selection of seed by farmers official recognition by introducing a system of registration of seed produced. The formation of the Macdonald-Robertson Seed Growers' Association was announced in 1903. During the first year, 164 farmers presented applications for membership.

At the first annual meeting of the association, June 15, 1904, the name was changed to the Canadian Seed Growers Association. Dr. Robertson was elected president. The object of the association was: (3) "To encourage the general use of improved seed with a view to increasing the yield and quality of the field crops of Canada".

Some of the main features of the original constitution and by-laws are: (3):

2 Providion was made for Branch Associations.

3 The object of this association is to advance the interests of seed growers and other farmers by:

a. Making regulations respecting the growing, selecting and preserving of seeds of various kinds of farm crops for the guidance of its members.

b. Causing records to be kept of the history of seeds produced by members.

c. Fixing standards for seeds that may be eligible for registration.

d. Publishing information as to standards.

e. Issueing certificates of registration to members by which "Hand Selected " seed, or the product therefrom , may be known from other seed.

f. Such other means as may be expedient from time to time.

4. Officers; a President, three Vice-Presidents, a Secretary-Treasurer, and ten Directors eledted each year at the annual meeting.

5. The Minister of Agriculture may appoint the president of the Association. The President may appoint five directors of the Association.

6. By virtue of his office the Chief of the Seed Division of the

branch of the Commissioner of Agriculture and Dairying shall be Secretary-Treasurer of the Association.

9. The executive council of this Association shall consist of: The Secretary-Treasurer and five directors to be elected by the Board of Directors.

10. The Association may admit as members the persons now enrolled as members of the Macdonald-Robertson Seed Growers Association, and any persons, resident in Canada who may choose to make seed growing a special branch of their farm operations, and who agree to conform to the By-Laws and Regulations of the Association.

11. The Association may admit as honorary members, persons who may be directly or indirectly interested in agriculture in Canada, but who may not be producers of seed. Such honorary members shall be eligible to hold office or otherwise enjoy all the privileges provided for members of the Association.

12. Applicants are to be admitted by vote at any meeting of the Association or of the Executive Council.

16. The Association shall hold at least one meeting each year, the time and place to be named by the Executive Council.

21. Fifteen members of the Association shall constitute a quorum.

22. Seven members of the Board of Directors shall constitute a quorum.

23. The decision of the Board of Directors on any matter pertaining to the working of the Association or to Branch Association shall be final.

24. It shall be the duty of the Executive Council to transact the business of the Association between meetings of the Association and between meetings of the Board of Directors.

27. It shall be the duty of the Secretary-Treasurer to attend all meetings of the Association, the Board of Directors, and the Executive Council; to keep correct minutes of the same; to send notices to meetings to members; to issue all publications; to keep records of the seed produced by members; and issue certificates of registration as directed by the Board of Directors.

28. This Association shall cause records to be kept of seed of: wheat, oats, barley, maize, flax, millet, peas and beans; also seed potatoes and such other crops as may be decided upon by the Association.

Some of the rules respecting the growing of seed were:

29. To entitle the seed of wheat, oats, barley, maize, flax or millet to be eligible for registration by the Association, it should be produced on a well cultivated seed plat from a crop that has followed in rotation after:

1. a. Clover, peas, beans, or some other leguminous crop.

b. A cultivated crop such as indian corn, turnips, mangels, carrots, beets, or potatoes.

c. A summer fallow.

d. Sod.

2. Peas, beans, or potatoes may follow in rotation after any other crop or after a summer fallow.

31. Each member must be a member of "Improved seed, " and must

each year conduct a "Hand-Selected seed plat" consisting of not less than one-fourth acre of land.

Concerning the registration of seed we find the following provisions:

33. There will be three distinct classes of registration of seed:

1. In the hand-selected class there will be registered as "Hand-Selected Registered Seed" only seeds obtained from heads selected by hand from the plants relatively the most vigorous and productive, on a registered hand-selected seed plat of at least the third year. The registration certificate of "Hand selected registered seed" will show the number of years of antecedent selection, as, for instance, "Hand selected registered seed of the fourth year" of the tenth as the case may be. Such seed will be suitable for use on hand-selected seed plats to produce "Improved registered seed".

2. In the Improved class there will be registered as "Improved Registered Seed" only grain obtained from a crop produced from hand selected seed. The registration certificate of improved registered seed will show the number of years of antecedent selection of the crop from which it was obtained as "Improved Registered seed from a crop of the third year". Such seed will be suitable for use on improved seed plats to produce "General Crop Registered Seed".

3. In the General crop class there will be registered as "General crop Registered Seed", only seed obtained from a crop produced from Improved Registered seed. Such seed will be suitable for use for the general crop of the farm, and the product from it will not be

eligible for registration.

34. Inspection. Members will at all times endeavor to assist the officers, and any person or persons whom the Executive Council or the President may appoint to inquire into or inspect the operations of members in the growing, selecting, preserving, or for which certificates of registration are issued.

It will be noted that this entire system of production and registration was based on a system of continuous hand selection of the largest heads. After three years of such selection, the remaining unselected seed formed the second class or Improved Seed, and from this improved seed plat seed for the general crop were obtained. During the first few years very little change was made in the methods of operation and the results were very encouraging. At first wheat and oats were the main crops with which the members worked, in 1909 a large number were taking part in the selection of other crops, especially barley, corn and potatoes. About this time it was seen that changes in the method of operation were necessary. (9) Experience derived from successive years of effort tended to show that although a number of striking successes had been achieved under the system of mass selection, many of those who took up the work of seed selection under the guidance of the association were unable to obtain further perceptible improvement in their crops after two or three years of work. This experience was to be expected following the discoveries of Professor Nilsson and his co-workers at Svalof in Sweden.

As a result of these considerations, several important ammendments to the regulations of the Association were adopted at the annual meeting in 1912. The following were the most important: By the term "Elite Stock Seed" is meant:

a. The general product of a hand selected seed plot or other area originating from hand-selected seed of at least three years satisfactory selection and which is considered by the executive to be worthy of distribution, or,

b. A pure stock of seed originating from a single plant, the progeny of which has been proven in plot or field test (and by analysis if necessary) to the satisfaction of the executive to be worthy of distribution. This seed must have been propogated exclusively by the originator or under his supervision.

c. By the term "Registered Seed" is meant the progeny of Elite Stock Seed up to and including the third generation descended therefrom when such projeny has been duly accepted for registration.

A change was also made in the methods of inspection; a threshed grain inspection being added and the seed being sealed under supervision with appropriate certification tags attached.

In 1914 the Association relieved the Seed Branch of the details of the inspection service.

In 1918 under the stress of war conditions and the urgent necessity for more seed, the Association adopted a resolution "That progeny of Elite Stock Seed, first generation Registered Seed, and second Generation Registered Seed be recognized as registered seed, providing the field and sack inspections have been properly made and the seed itself be up to the standard". This did not sufficiently

increase the supply and in 1919 the regulations were amended so as to permit seed to be registered indefinately so so long as the required standard of purity, vitality and quality was maintained. This arrangement proved a success and materially increased the registered seed supply.

On June 20, 1920, the Canadian Seed Growers Association was incorporated under the Companies Act as a recognized business concern.

By the Seeds Act of 1923 the former voluntary grades of seeds consisting of kinds, varieties and selections approved by the Association, were incorporated as legal grades in Cominion Law. This placed the inspectors of the Seed Branch at the disposal of the Association, The field and Seed inspection is now done by some thirty trained officials applying uniform standards. At this time the development of a more satisfactory distributing service for the product of seed growers was taken into consideration. The association does not conduct a regular seed merchandising business itself, but it promotes this phase of the work by encouraging cooperative seed marketing through other associations. The Association also publishes and distributes, each year, a detailed report of crop registration. A great amount of publicity work is also carried on both in Canada and abroad.

This Association is one of the most successful of its type. Its relationship with the Government and cother crop improvement agencies is well established. It is rendering a great service to its members and agriculture in general by the registration of varieties of practically all grain, legume, and vegetable crops adapted to Canadian conditions.

Wisconsin.

The Wisconsin Experiment Association, organized Feb. 22, 1901 with 187 members, was the first of its kind in the United States. In 1898 Professor R. A. Moore of the Agromomy Department of the University of Wisconsin took up the work of breeding farm crops for higher quality and better yields. At first the work was partially financed by Professor Moore himself. The outstanding results, however, of some of his selections led to an expansion of his work.

The Association was organized to further the production and dissemination of these improved selections. The organizers felt that it was necessary to have some one thoroughly trained in the seed grain work and one who felt the responsibility of going into the growing of pure bred seed in order to carry on the work properly. So, the original constitution provided that only a party who had taken work in the Wisconsin College of Agriculture could become a member of the Experiment Association. In 1906 this was changed to include men from other colleges.

The object of the Association was to promote the Agricultural interests of the state by:

a. Carrying on experiments and investigations that shall be beneficial to all parties interested in progressive farming.

b. Forming a more perfect union between the farmers and the present students of the Wisconsin College of Agriculture, so as to enable them to act in unison for the betterment of rural conditions.

c. Growing and disseminating among its constituency new varieties of farm seeds and plants.

d. Sending literature bearing upon agricultural investigation to its membership.

e. Holding an annual meeting in order to report and discuss topics and experiments beneficial to the members of the Association.

County Orders of the Association were established with the following objects in view, to promote the agricultural interests of the county and state in general, by:

a. Cooperating with the Experiment Association in growing and disseminating pure bred seed grains.

b. Having Association exhibits at agricultural fairs.

d. Having annual meetings in order to report and discuss topics beneficial to all.

The membership of the Order was:

a. Persons who had taken a course in the College of Agriculture at Madison or any place in the State under the jurisdiction of the College.

b. Anyone interested in pure bred grains and live stock or in progressive farming in general.

c. Honorary membership might be conferred by vote upon anyone interested in progressive agriculture.

In 1922 an amendment was passed making any person taking an interest in pure bred grain and live stock and who is also a member of a county organization, through the recommendation of the secretary of the County Association, eligible for membership in the State Association.

The Association has had a successful growth and has continually rendered a great service to its members and the state. It is at present, one of the outstanding Associations of the country.

The organization and activities of the Wisconsin Experiment Association resembles very much the Michigan Crop Improvement Association, which will be discussed in detail later. Membership is not limited and is granted to anyone on application and the payment of the annual membership fee of one dollar.

The officers of the Association are, a President, a Vice-President and a Secretary and Treasurer. They hold office for a period of one year. The President, in addition to the ordinary duties of his office, appoints all regular committees as he may deem expedient for the welfare of the Association. The President and Secretary are ex-officio members of the Executive Committee.

The Association is an independent State Association and receives five thousand dollars per year directly from the State. The Management of the Association has been centered in the Agronomy Department of the Agricultural College in such a way that it is thought of as a part of the Agronomy Department.

The Association has the first opportunity of taking the pure bred seed that have been developed on the Experiment Station farm. These seed are tested out under various conditions throughout the state, and when it has shown superior merit it is released to growers. "Each member (10) is intitled to one bushel of small grain or enough corn to plant an acre. Each variety is thus increased rapidly and widely disseminated in a short time. If the members desire to sell seed, they report the name of the variety together with the amount offered for sale to the secretary of the Association.

"The seed is carefully inspected, both in the field and in the bin, by a representative of the Association to determine: its trueness

to type, freedom from mixtures of other grains and freedom from weeds and disease. If the seed passes inspection, the growers name, together with the amount of seed he has for sale, is listed in a special pamphlet, and sent, on application, to all prospective purchasers of pure bred seed."

The County Agents coope rate in making field inspections, thus enabling the Association to make a large number of inspections during the short period in which the grain is heading. Neither the College nor the State assume any control over this inspection service. By this use of the Co8nty Agents, the inspection has been done without charge to the members of the Association.

For the grain inspection, a representative sample is sent directly to the office of the Association where it is tested. If it passes this inspection, it is then placed on the inspected list and the grower is furnished with the proper certificate of inspection. The Association does not seal the sacks of grain. The seed thus inspected are classed as "registered" or "Certified". "Registered" seed is of especially high quality and purity and is recommended particularly for those who wish to grow the improved varieties for seed production and sale. "Certified" seed is improved seed of high quality and purity which carries all the advantages of improved varieties, but does not quite reach the standard set for "Registered" seed.

Michigan.

In 1906 under the leadership of the Farm Crops Department of the Michigan State College, a number of corn growers organized the Michigan Corn Improvement Association. Their purpose was, to hold state corn shows and in other ways promote better corn for Michigan. They held shows at the College until 1909, at Kalamazoo 1910 and 1911 and again at the College until 1915. At this time they merged with the Michigan Experiment Association.

The Michigan Experiment Association was organized under the leadership of Professor V. M. Shoesmith of the Farm Crops Department of The Michigan State College in 1911. The organization was copied after the Wisconsin Experiment Association. It had for its main purpose the production and dissemination of improved varieties of farm crops. The Plant Breeder of the College, Professor Frank A. Spragg, had been distributing improved varieties of seed since 1909. He had put out: Plymouth Rock, American Banner and Shepherd's wheats. He had met with some success in putting out these varieties, but felt the need of an association for organized effort in the increase and maintenance of these seeds. When the Association was established, Professor Spragg had ready for immediate distribution: Rosen Rye, Red Rock wheat, Worthy oats and Alexander oats. These varieties were distributed among the members. They proved satisfactory and a wide distribution was immediately obtained. As early as 1915, 500 acres of these varieties were listed for seed (11).

The merging of this association with the Michigan Corn Improvement Association in 1915 greatly strengthened the Experiment Association, bring-

ing to its membership some of the most successful farmers in Michigan.

In 1916, the Association work was increasing rapidly. In February and March 1915, twelve thousand bushels of Worthy and Alexander oats were handled. At the annual meeting that year Professor A. L. Bibbens was elected as Assistant Secretary to Professor Shoemith.

The Association activities increased rapidly and a big demand for pedigreed seed developed. In the Fall of 1916 the membership had increased to 1600. Since that time the membership has decreased considerably, experience having shown that most efficiency has resulted from a smaller membership of picked seed producers.

A few complaints in 1915 emphasized the need of both field and threshed grain inspections. This inspection service was inaugerated in 1916, a fee being charged to cover the cost.

The name of the organization was changed to that of the Michigan Crop Improvement Association in 1917. At that time Mr. J. W. Nicolson, Extension Specialist in Farm Crops of the Michigan State College, became Secretary-Treasurer. Since that time the Secretary-Treasurer has been a member of the Extension Staff of the Farm Crops Department of the College.

About this time it was found necessary to develop a system of registration in order to keep up with all seed and to be able to guarantee its purity. After a careful study of the systems used by the Canadian Seed Growers Association and the Wisconsin Experiment Association, Mr. Nicholson arranged a system of registration and certification based upon the origin of the seed and guaranteed through field and threshed sample inspections.

In 1919 the Michigan State Farm Bureau was organized. A Seed Service Department was a part of their organization. Mr. Nicolson went to manage this department. It is independent of the Crop Improvement Association; but, in addition to handling all kinds of seed for the Farm Bureau members, it is the chief selling agency through which the several members of the Crop Improvement Association market their seed.

Mr. Nicolson was succeeded by Professor A. L. Bibbins as Secretary-Treasurer of the Association. Mr. Bibbins held this position several years and was succeeded by Mr. H. C. Rather, the present Secretary-Treasurer.

In 1919, Professor J. F. Cox of the Farm Crops Department inaugurated the service of variety testing. Tests of the adaptibility of different strains to the several sections of the state were made.

The activities of the Association developed rapidly. By 1926, we find the following certified seed offered in large quantities:

Rye	-Rosen
White Wheat	-American Banner.
Red Wheat	- Red Rock; Berlley Rock
Oats	- Wolverine; Worthy.
Barley	- Wisconsin Pedigreed; Michigan Black Barbless.
Corn	- Yellow Dent; Golden Glow; Duncan; Pickett's; M.A.C. Yellow Dent
White Corn	- Early Silver King; White Cap; Folks' White Cap; Clement's White Cap.
Beans	- Robust.
Soy Beans	- Manchu; ItoSan; Black Eyebrow.

The Association has gradually evolved a safe and sane system of registration and certification. This system takes improved seed originated by the College Plant breeders or others, tests their adaptibility, increases the supply, safeguards their purity and puts into the hands of the consumer a guaranteed, quality product.

A detailed discussion of this Association is of value: First because it is an example of the successful type of association. Second, becuase many of the associations in the United States have copied the Michigan plan in forming their associations.

This Association is an organization of Michigan farmers co-operating with the Michigan State College in the development, production and dissemination of improved varieties of crops.

CONSTITUTION.

Article I. Name-

This organization shall be known as the Michigan Crop Improvement Association.

Article II. Object.

The object of this association shall be to promote the production of better crops in the State.

1st. By carrying on demonstrations to prove the value of progressive agricultural methods.

2nd. By growing and distributing improved varieties of farm seeds and plants.

3rd. By holding of farmers' meetings and exhibitions of farm products and by the dissemination of scientific knowledge as applied to Michigan agriculture, through literature and such other means as may be most efficient.

4th. By holding an annual meeting and grain show to discuss and demonstrate the work of the Association.

Article III. Membership.

Section I. Any resident of Michigan, who conforms to the rules of the Association shall be entitled to membership on payment of the annual dues.

Section II. Boys, who have completed three years of Club Work or have won two championships may be admitted to junior membership with full privileges for one year, on payment of fifty cents.

Section III. Honorary membership may be conferred upon any one interested in progressive agriculture by a majority vote at any annual or special meeting of the Association.

Article IV. Dues.

The annual dues of each member shall be one dollar. All dues are payable January 1st.

Article V. Organization.

Section I. The officers of this Association shall consist of, A president, vice-president and secretary-treasurer, whose term of office shall be one year, or until their successors are elected.

Section II. The duties of the officers shall be such as usually pertain to their respective offices.

Section III. As Amended. The immediate affairs of the Association shall be under the control of an executive committee composed of, the president, vice-president, secretary-treasurer, supervisor of introductions and inspections. Professor

of Farm Crops, M.S.C., Plant Breeder, M.S.C., Manager of the Seed Department of the Michigan State Farm Bureau and six others members elected from the Association Membership.

Section IV. The president, vice-president and six directors coming from the association membership, shall be elected by the members of the Michigan Crop Improvement Association at their Annual Meeting held at East Lansing at the time of Farmers' Week at the Michigan State College. The Secretary-treasurer, Clerk and Superintendent of introductions and inspections shall be appointed by the executive committee from the extension staff of the Michigan State College.

The Professor of Farm Crops, the Plant Breeder and the Manager of the Seed Department of the Michigan State Farm Bureau shall be members of the executive committee by virtue of their position.

Article VI. Quorum.

Fifteen (15) members shall constitute a quorum.

Article VII. Amendments.

This Constitution may be amended by two-thirds vote of the members present at any annual meeting of the association.

BY-LAWS.

1. This Association shall be governed by Robert's Rules of Order.

2. These by-laws may be amended by majority vote at any annual meeting of the association.

3. On proof of the use of fraudulent or other undesirable methods for the sale of seed a member may be suspended by unanimous vote of the executive committee; and may be expelled by a two-thirds vote of

the members present at a regular meeting of the Association.

4. A Board of Review, consisting of the Secretary, Professor of Farm Crops, M.S.C., Plant Breeder, M.S.C., shall handle all inspection appeals and disputes.

The Michigan Association has endeavored to carry out the purposes set forth in its constitution in the following manner:

Demonstrations: The Association and its individual members have cooperated in every way possible with the activities of the Michigan State College. They have assisted the extension staff in putting on demonstrations and have been a means through which these workers could get local contact in the several communities.

Holding Meetings and Disseminating Scientific Knowledge: This is carried out only through having scientific speakers on their programs at meetings and through the spreading of literature published by the Association from time to time.

Annual Meetings and Grain Shows: These are held regularly during Farmers Week at the Michigan State College. The Association offers prizes, consisting of cups and cash to those exhibiting the best potatoes, grains, beans, etc. The number of exhibitors has been large, the competition keen and the educational value of the shows outstanding. These meetings offer excellent opportunities for members to exchange ideas and discuss ideas given to them by the College men. They see here the demonstrated value of better agriculture and get both information and inspiration.

Growing and Distributing of Improved Varieties: This is considered the phase of the work wherein most good can be accomplished. Bibbins (11) says "High quality seed is the prime factor of successful crop

production". Thus, the Michigan Association hinges upon this idea and its organization and activities are based on carrying out this purpose.

The Michigan System of registering pedigreed seed is as follows: To be adopted by the Association for registration purposes, a strain must have shown outstanding merit and adaptibility in tests conducted at the College and throuout the State. Most of the varieties accepted have been developed by the Plant Breeding Division of the Michigan State College. The Association looks to this division as the source of further improvement. However, seed of proven merit from other sources are considered and varieties are being certified orginating both from private sources and from other Associations. Varieties that are not increased directly from pure line stock are carefully tested for purity. Open pollinated crops are tested for continuous vigor and productiveness.

The Association divides seed into three classes: Elite, Registered and Certified.

Elite seed are (1) "The first increase of seed released by the Michigan State College. They are defined as seed of a pure line selection, or seed of exceptional merit which has demonstrated its superiority in tests conducted or approved by the Farm Crops Department of the Michigan State College. Elite stock seed may be produced by any individual grower whose work fulfills these conditions. It does not ordinarily pass through commercial channels, being used almost entirely for the purpose of introducing new varieties or improved strains of old ones".

"Registered" seed is seed (1) which upon inspection, have been found to possess qualities that make it particularly desirable as parent

seed for new growers just starting seed production under inspection. It consists of the best lots of seed of any variety and it has special high requirements to which it must conform. These requirements vary for individual crops.

"Certified" seed are seed that are descended from Elite, Registered or Certified seed. They have passed the required inspections as to quality, purity, etc., and have been approved or Certified by the Association. This class designates the great bulk of seed produced by the Association. The purpose of this class is to make available, large quantities of guaranteed seed of high-yielding, adapted varieties, at prices which make such seed a sound investment to the average farmer. It is eligible for further inspection, only on the farm upon which it was produced. Growers purchasing seed with a view to having the resulting crop inspected, must start with seed of the Elite or Registered grades. Certified seed, however, possess all the inherant superiority of the variety and it is recommended for all crop growers not making a specialty of seed production.

In this system four classes of growers are considered: The plant breeder develops a variety and produces Elite seed; The grower who makes a specialty of seed production buys Elite or Registered seed and produces Registered seed; the general seed grower buys Registered seed or plants Certified seed produced on his own farm and produces Certified seed; The general producer of grain, hay, etc., who buys Certified seed, cannot have same certified. He is assured, however, of getting the highest quality of seed obtainable.

The regulations governing the standards, etc., are as follows: (1)

CERTIFIED SEED STANDARDS

Small grains.

1. Certified seed must trace through fields regularly inspected by the Michigan Crop Improvement Association to seed stock of exceptional merit originally bred or, after field test, approved by the Farm Crops Department of the Michigan State College. New Growers or old ones renewing their seed stocks must start with Elite or Registered seed. However, it is not necessary for the grower whose crop makes the Certified grade to renew his seed, as the crop grown therefrom is eligible for inspection and listing in any grade which its quality warrants.

2. FIELD INSPECTION. The Association inspector will call at the grower's farm within three weeks of harvest. At this time, all roguing and removal of weeds and mixtures from the field must have been completed. The inspector will report conditions in the fields as he finds them. He neither passes or rejects the crop. This is done by the Association Board of Reviews. The Board of Reviews will not pass fields containing dangerous or noxious weeds which cannot be readily and completely cleaned from the threshed seed. It will also reject fields showing a lack of vigor or which are otherwise in such condition as to bring certified seed into disfavor were the field accepted.

3. Fields must show less than 1% of disease.

4. Barley, wheat and oat fields must be grown from seed given formaldehyde or similar treatment for smut, and there must be no presence of disease, thus controlled, in either field or threshed grain. (See M.S.C.

Extension Bulletin No. 13).

5. Rye being open-fertilized must be grown at least forty (40) rods from fields which would furnish a possible source of contamination by cross pollination.

6. SEED INSPECTION. The basis for final inspection will be one peck of uncleaned seed just as it comes from the thresher. This seed will be given a practicable cleaning at Association headquarters with a farm-sized clipper mill. Information as to manner of cleaning and screens used will be furnished to the grower. Analysis will then be made of the cleaned seed.

7. Seed must conform to the following standards of weight per bushel: Oats 32 lbs., red wheat 60 lbs., white wheat 58 lbs., spring barley 47 lbs., winter barley 46 lbs., rye 55 lbs. On sale the ordinary legal weights are furnished.

8. Seed must have less than one-half of 1% objectionable foreign material.

9. Seed must contain no more than five weed seeds and no more than five other crop seeds per pound.

10. In exceptional seasons provision may be made for Class II Certified Seed which is not more than two lbs., under the required weights per standard bushel for regular certified seed.

11. Seed must germinate 90% or more.

12. Seed must show a purity of at least 99%.

13. The Association reserves the right to reject seed containing any trace of noxious or very dangerous weeds. It will not pass seed that is undesirable because of weeds, regardless of its other qualities.

14. Weed conforming to these standards may be sold under the Certification tag of this Association provided it is cleaned with a good

mill on the owner's premises or in such other place as the Association may designate, and provided the seed thus cleaned is equal or superior to the analysis determined by this inspection and placed on the certification tag. The grower assumes full liability on any seed which he sells as certified seed and he must guarantee that it conforms to the above standards.

BEANS AND SOYBEANS.

Certified Bean Seed must conform to all the requirements for the certification of small grains with the following exceptions and special provisions:

1. Final inspection of field beans will be on the basis of five pounds uncleaned just as the beans come from the thresher and an additional five pound sample hand-picked and guaranteed by the grower to accurately represent the seed as he will offer it for sale.
2. Beans and Soybeans must be 99.8% pure as to variety and crop.
3. Certified beans must conform to the requirements of the Michigan Bean Jobbers' Association for its choice hand-picked grade: vix., They must be bright, sound, dry, well screened and must not contain more than one and one-half per cent of discolored or split beans.

CORN

1. Certified seed corn must trace through fields regularly inspected by the Michigan Crop Improvement Association to seed stock of exceptional merit originally bred, or after field test approved by the Farm Crops Department of Michigan State College. New growers or old ones renewing their seed stock must start with Elite or Registered seed.
2. FIELD INSPECTION: The Association inspector will call at the

grower's farm within three weeks of harvest. At this time, the vigor and uniformity of the crop, varietal type, placing of ears on the stalks, freedom from disease, and similar features will be noted. The Board of Reviews will not pass fields showing lack of attention on the part of the grower, lack of vigor, or other characteristics which might bring certified seed into disfavor, were the crop accepted.

3. Fields must show less than 1% of plants with disease, transmissable through the seed.

4. The corn must be grown at least 40 rods from the nearest field or other corn which might contaminate it by cross pollination. Under unfavorable conditions, nearby fields of corn of another variety may cause rejection even though the intervening distance be greater than 40 rods.

5. STORAGE INSPECTION: The basis for final inspection on corn will be an examination of the entire lot of seed corn under storage. This inspection will be made after January 1st, at which time kernel samples will be taken of at least 100 representative ears, for the purpose of conducting germination and moisture tests.

6. This corn must contain less than an average of one kernel per ear of a distinct mixture.

7. All ears selected must be sound, of good type for the variety, and free from disease.

8. The corn must have been dried to 15% moisture. It is unsafe to shell and store or ship corn containing a higher moisture content. Growers whose corn has not been sufficiently dried may be given another opportunity to complete their drying opperations, providing

the seed is still of satisfactory germination. This Association will not authorize the sale under its name and tag of shelled corn, testing more than 15% moisture, nor of corn on the ear testing more than 17%. Since nearly all the seed corn is sold on the shelled corn basis, it is advisable for the grower to dry his corn on the ear in a well ventilated storage room, to 15% moisture, by the time severe freezing weather sets in. Otherwise, its germination may be injured and the seed rejected as unfit for certification.

9. Corn must germinate at least 95%.

10. Before shelling corn, each grower must butt and tip individual ears. The balance of the shelled corn must be run through a satisfactory grader, so the kernels will be uniform in size, making it more desirable for planting purposes. A rotary grader is recommended. Samples of this graded corn are to be submitted to the Association headquarters for analysis, and if the grading proves unsatisfactory, certification may be withheld.

REGISTERED SEED

Small Grains, Corn and Beans.

A committee consisting of the Head of the Farm Crops Department, Michigan State College, the Superintendent of Introductions and Inspections, and the Secretary of the Association, after carefully considering field reports and samples of seed which have been regularly inspected, will select certain choice lots for Registration. This selection is based entirely upon the quality of the seed and the care with which it may be handled.

A bin or sack inspection is then made on the grower's farm or at the cleaning point and seed passing this inspection is given a certificate

of Registration, sacks are sealed and tagged and seed is ready for distribution.

The purpose of Registered Seed is to furnish high quality parent stock of high-yielding approved varieties. It will always be somewhat limited in quantity due to the high standards which must be maintained, and it will find greatest distribution among farmers especially interested in seed production; particularly among members of the Michigan Crop Improvement Association who are growers of Certified Seed, the great commercial product of this organization.

In addition to being of very high quality and appearance and conforming to all requirements given for Certified Seed, Registered Seed of grains must contain apparent mixture of not more than one seed of another variety or crop per pound. With beans, soybeans and similar seeds, the limit shall be one foreign seed in two pounds, while with corn there must be less than an average of one kernel of distince mixture for each ten ears.

GENERAL REGULATIONS.

1. All inspections are to be made by authorized agents of the Michigan Crop Improvement Association, whose training in crops meets the approval of the Farm Crops Department of the Michigan State College. The inspedtors and the inspection work are supervised by a Crops Extension Specialist of the Michigan State College. It is the aim, in so far as possible, to make this inspection service educational rather than regulatory.
2. An official certification or registration tag issued by the Michigan Crop Improvement Association must be attached to every bag or parcel of seed sold under certification of the Association. Persons claiming certification of this organization without using proper official tags,

or using tags on seed for which such tags were not authorized are misrepresenting their seed.

3. All fees and dues must be paid before inspection is made. (Application blanks give inspection costs).

4. Each grower upon applying for inspection agrees that if his seed passes he will not charge more for it than the prices suggested by the Board of Directors of the Association for seed of that grade. Any grower charging more than Association prices does so without the approval of the Association and his seed loses the registration or certification which may have been given it.

5. It is recommended that growers make a 10% reduction in prices of seed to their neighbors to encourage standardization of high yielding varieties within the community or county.

6. Eligibility for registration or certification of seed failing to meet the Association requirements in any given season may be carried over one year at the discretion of the superintendent of introductions and inspections. This also holds where a grower has neglected to apply for inspection provided he has had inspedtion the previous season.

7. In general it is inadvisable to attempt the production of more than one variety of the same crop on one farm and the Association reserves the right to refuse inspection in such cases.

8. All inspection appeals and disputes are handled by the Board of Reviews.

MICHIGAN CROP IMPROVEMENT ASSOCIATION REQUIREMENTS
FOR THE PRODUCTION OF CERTIFIED ALFALFA SEED.

1. The varietal genuineness of the seed planted must be satisfactorily established with the Board of Reviews of the Michigan Crop Improvement Association. In the case of Hardigan Alfalfa, it must be thru a well definied pedigree tracing to the original Hardigan seed released by the Michigan Experiment Station.
2. The field upon which the seed has been planted must not have grown another variety of alfalfa for at least four years, during which time one or more intertilled crops must have been grown to insure freedom from any plants of other varieties.
3. The field must be so located with reference to other fields of alfalfa, and its must be so handled, as to minimize all danger of contamination with inferior alfalfa by cross pollination. An isolation of at least 20 rods is desirable.
4. At least one field inspection will be made to ascertain the presence of noxious weeds, mixtures of other crops, or plants of inferior varieties. The field is subject to further inspection at any time.
5. A sample of uncleaned seed must be submitted to the Michigan Crop Improvement Association in order to determine its suitability for cleaning and marketing as certified seed.
6. Cleaning shall be done by the Michigan Farm Bureau Seed Service under the supervision of the Inspection service of the Michigan Crop Improvement Association, except in instances where special permission is otherwise granted.

7. Seed must contain less than a total of 1% weed seed, other crop seed, and objectionable foreign material; less than one in five grams of the seed of noxious weeds, namely -- Canada thistle, Quack grass, Dodder, Mustard, and Wild Carrot; must be of good appearance and must germinate 80% or more, exclusive of hard seed.

(The Michigan Crop improvement Association reserves the right to reject for certification any seed containing dangerous weeds, even though such weed be present in amount of less than one in five grams of crop seed. This organization will not certify seed which is undesirable because of the presence of weeds.)

8. Seed which meets these requirements may be certified by the Michigan Crop Improvement Association, provided it is sold in bags sealed by an authorized representative of the Association. Lots will be conveniently divided into 15, 30 and 60 pound sacks, the value of the sacks to be covered in Association list prices of the seed.

Each sack of such certified alfalfa seed must contain the official certification tag of the Michigan Crop Improvement Association which shall bear an identification number and the analysis required by the Michigan Seed Law. It may then be sold as Certified Alfalfa under its proper varietal name

Special Grades - Special provision may be made, at the discretion of the Board of Reviews, for certification of alfalfa containing a properly designated light mixture of other crop seeds.

Registered Seed -- Lots of alfalfa conforming to all of the above requirements and deemed by the Board of Reviews of the Michigan Crop Improvement Association as particularly suited for foundation stock for fields intended for seed production may be designated as

Registered Seed.

Fees -- The following scale of fees will be employed in alfalfa inspection:

(a) Annual membership in Michigan Crop Improvement Association $1.00

(b) Field inspection fee for each variety, any acreage $5.00

(c) Sealing fee for all seed cleaned and sealed at the Michigan Farm Bureau Seed Service warehouse in Lansing . . . . . 1/2 cent per lb.

(d) Travel fee when seed is sealed at places other than Lansing $5.00

Note -- This fee represents the average lot cost of an inspection trip and will be an added charge on each grower's seed sealed away from Lansing, the rate being the same, regardless of the amount or location of the seed.

Field inspection and annual membership fees are payable at the time application for inspection is sent in. Membership fees must be paid annually.

Field inspection fees need be paid only once for any given acreage, but must be paid when the inspection of any new acreage is required.

Sealing fees are required on each lot of seed sealed.

Travel fees must be paid for each trip required of a sealing inspector.

FEES.

Following is the new scale of fees adopted by the Board of Directors February 6, 1924.

(a) Annual membership in Michigan Crop Improvement Assn...$1.00

(b) Field Inspection fee for each variety, any acreage up to 20 . . . . . $5.00

(c) Additional fee for each acre over 20 . . . . . $ .25

(d) Service fee, for each variety passing inspection ... $5.00

EXPLANATION OF FEES

(a) ALL fees are payable at the time application for inspection is sent in.

(b) The field inspection fee just covers the average cost of making field inspections and will not be refunded whether the crop passes or not.

(c) The service fee covers final inspection, seed lists, and publicity and will be retained only for those crops passing complete inspection. For any crop rejected either in field or final inspection, except with corn as noted below, the service fee will be refunded.

(d) Since corn inspection requires an additional trip the service fee will not be refunded on corn rejected on storage inspection.

(e) Growers whose seed is registered and sold in sealed bags will be required to pay a sealing fee of 5¢ per seal.

(f) In no case will there be any reduced rates.

SPECIAL

A closing date will be announced in a letter to all persons on record as having crops eligible for inspection, announcement to be made at least two weeks prior to the date established. When application is

received later than this closing date, a delinquent fee of $2.50 will be charged for each inspection. The association reserves the right to refuse all applications received one week after the closing date.

METHOD OF PROCEDURE.

The certification of seed by the Michigan Crop Improvement Association is made on the basis of inspections of the growing crop and the threshed seed.

FIELD INSPECTION

The Association inspector will call at the grower's farm within three weeks of harvest time. At this time all rogueing and pulling out of weeds and mixtures must have been completed. The inspector will report conditions in the fields as he finds them. He neither passes nor rejects the crop. This is done by the Association Board of Reviews.

BASIS OF THRESHED SEED INSPECTION

Grains, Field Peas, and Soybeans: One peck of uncleaned seed as it comes from the thresher.

FIELD BEANS: Four quarts handpicked and guaranteed by grower to accurately represent the seed he will offer for sale.

ALFALFA and SEEDS of SIMILAR SIZE: One pound of uncleaned seed and one pound cleaned, the cleaned seed guaranteed by seller to be representative of that which is offered for sale.

CORN: Inspection of entire lot of seed corn under storage.

NOTE: Samples will be called for by letter from the Association Secretary and sacks for the samples will be furnished.

MANNER OF THRESHED SEED INSPECTION

Where only an uncleaned sample is called for this seed will be given a practicable cleaning at Association headquarters, with a farm-sized

clipper mill. Information as to manner of cleaning and screens used will be furnished to the grower. Analysis will then be made of the cleaned seed. Similar analysis will be made of seeds where the grower submits a representative cleaned sample. All lots which pass these inspections will be carried on the regular Association seed lists and sufficient Association tags will be furnished the grower so one may be attached to each bag or parcel of seed which he sells. These tags give purity, germination and other information concerning the seed, along with the Certification of the Michigan Crop Improvement Association that such seed is of the variety named and conforms to the Association standards for its designated class.

DISTINCTION BETWEEN REGISTERED AND CERTIFIED SEED.

Seed passing the regular inspections of this association will be ordinarily placed in either of two classes, namely: Registered Seed and Certified Seed. Standards for these classes are given in the Pedigreed Seed Requirements. Certified seed is the real commercial product of the Association and is sold entirely upon its merit as a sound investment for the growers desiring seed of high productivity.

The resulting crop is not eligible for further inspection. New growers desiring parent stock for the production of seed under inspection and old seed growers desiring to renew their parent stock, must start with Registered seed.

While the Registered class has definite requirements below which seed may not fall, this Association has adopted the policy of selecting for this class only enough seed, from the most desirable lots available, to meet the needs for parent stock as indicated above. The rest of the

seed conforming to Registered standards will be placed in the Certified class.

From the first, the Michigan Association has laid stress on high quality. This is obtained only through very thorough inspection. Only members of the Farm Crops Department of the College or men trained by them are permitted to inspect. The field inspection is made within three weeks of harvest. The purpose of this is to see if seed as grown in the field, is true to variety and type, free of mixture, free of weeds and disease, and, in cross pollinated plants, if the crop is sufficiently removed from other varieties to prevent cross-fertilization. Growers are required to have fields ready for inspection at this time by, rogueing out mixtures, weeds, etc. County Agents are called upon to assist growers in this work. The inspector reports to the Secretary-Treasurer, who renders a decision relative to the passing or rejection of the field.

The final grain inspection is only made where fields have satisfactorily passed the field inspection.

The experience of the Association has been that growers can be relied upon to furnish representative samples for this grain inspection. Accompanying this sample, the grower sends a signed certificate that the sample is representative of all such seed that he will offer for sale.

When seed have passed both inspections they become the "Certified" seed of the Michigan Crop Improvement Association. The grower is then furnished with the proper tags and each bag of seed he sells is labeled. These tags contain a complete statement of every factor that the buyer should consider in purchasing seed, and the guarantee of the Association that these statements are correct.

Certified seed (1) pass through every one of the channels

through which farmers ordinarily secure seed. A large portion of it is sold directly from one farmer to another. Some growers sell their certified seed to local dealers and elevators who market it to their customers. Others have standing relations with large wholesale seed houses in the State, and from these certified seed pass through the barious channels leading to the ultimate user.

The Seed Department of the Michigan Farm Bureau has been by far the largest individual handler of Michigan Certified seed. Many farmers find it profitable and desirable to consign their seed for sale to this organization. The Seed Department also maintains connections whereby it brings into the State large quantities of Certified seed from other states.

The Association is financed by funds derived from membership, and inspection fees. This has been sufficient to maintain the organization.

Arkansas.

The Arkansas Seed Growers Association was organized in 1920, following preliminary work in 1919. At this time there was practically no dependable pure bred seed available in the State. Through the activity of the association, foundation seed stocks of the most important varieties of field crops have been placed in the hands of grower-members of the Association. In 1923 a large quantity of registered and certified seed of the leading small grain varieties and of standard varieties of cotton and corn was placed on the market. This supply has materially increased since that time.

This Association is patterned after the Michigan Association. It is very closely connected with the College of Agriculture of the University of Arkansas. The activities of the Association are directed by an ex-

ecutive committee of five members, together with the President and the Secretary of the Association. The following standing committees are appointed by the President:

a. Committee on Cotton

b. Committee on cereal crops.

c. Committee on forage crops.

These committees shall define and describe the characteristics of each variety recommended, adopt score cards, and outline methods of maintaining purity and of accomplishing approvement.

Two other committees assisting in the work are:

a. Committee on Inspection and Seed Marketing.

b. Committee on Exhibits and Premiums.

Membership in the Association is not limited. Applications for membership are referred to a committee for recommendations.

The fee for active membership is four dollars per year, for associate membership one dollar per year. Active members are entitled to inspection upon payment of the inspection fee of six dollars for each variety of forty acres, or fraction thereof, and 10 cents per acre for each additional acre.

California.

The California Pure Seed Association was organized in 1925. The plan of organization resembles somewhat the Michigan plan. The requirements for the different grades are based on the recommendations of the International Crop Improvement Association.

The Association is a department of the California Farm Bureau Federation. It is controlled by the Federation through its Board of Directors.

The objects of this Association as set forth in the constitution are:

a. To encourage the development and use of better crop seed.

b. To introduce better strains of seed.

c. To encourage the testing of new strains.

d. To aid and support all agencies engaged in this work.

e. To promote the distribution of foundation stock

f. To provide for the keeping of records of the history of seed used by members.

g. To adopt standards of excellence for all seeds to be grown by members.

h. To make available an inspection service for members growing seed crops.

i. To require and regulate certification of all seed produced from foundation stock.

j. To provide,and require the use of, a uniform and distinguishing mark, tag or emblem for use on all certified seed.

k. To rent and hold property, etc.

l. To hold meetings, publish reports, conduct demonstrations and exhibits, collect and distribute information of interest and benefit to the members, and by these means increase the interest in and use of improved seed.

m. To aid the members of the Association and to promote the agricultural interests of the State.

In this Association, the function of the allied and cooperating organizations is outlined as follows:

a. The Division of Agronomy of the University of California; To secure or originate and test varieties of field crops, train inspectors and conduct researce.

b. The Farm Bureau: To organize the Seed Growers Association and correllate its activities.

c. The State Depart ent of Agriculture: To inspect and certify seed according to State law.

d. Agricultural Extension Service: To act with the Division of Agronomy, to test varieties for local adaptation, and to facilitate the operations of the Association by an educational program.

The membership is limited to those who are members of the State Fram Bureau. The membership fee is ten dollars.

The inspectors are appointed by the Pure Seed Association. They have no relation to the College except they are tained by the Division of Agronomy. The inspection service is financed by sums advanced by applications for certification. Each applicant deposits with the Association, at the time of applying for inspection, an inspection fee of one dollar per acre. In addition to the cost of inspection, which is met by this fee, the cost of maintaining the Association, providing tags, advertising certified seed, etc., is met by a certification fee of two dollars per acre. This fee is assessed on all seed crops which pass inspection and are found eligible. Any surplus collected in this manner is rebated.

At present only a few crops are certified and the membership of the Association is small. Crops such as: Heileman Milo, Kanota oats, Alcolde wheat and Sacramento barley are bing certified. The Association intends to keep the number of varieties certified low as possible, for

conserving the best interest of the farmer.

The Experiment Station expects to use the Association in every way possible for distributing seed developed by it. They do not consider the Association as the most efficient means of increasing and distributing seed in large amounts, but think it the most efficient and best known method for distributing and maintaining purity.

Colorado

Under the leadership of the Agronomy Division of the Colorado Agricultural College, the Colorado Seed Growers Association was organized. The main purpose of the organization was to get higher quality crops grown in the State. The production of seed was considered as only incidental to this larger program.

This Association drafts its own rules and officially certifies seed. Officially, it has no direct connection with the College, but, actually, the entire supervision is done by the Agronomy Department and the State Seed Laboratory. The State Seed Laboratory, being by law, located in the Experiment Station, connects the Experiment Station with the Association. As a part of the Extension service, the Extension Agronomist acts as Secretary of the Association.

The membership is determined by application and is limited only by the qualifications of the applicant. If the individual is deemed trustworthy, is actually growing high class seed, conforms to the rules and regulations and pays the fee, he is enrolled as a member.

The rules for certification are essentially those recommended by the International Crop Improvement Association. They do not differ materially from those of the other Associations.

The inspection service is carried on in two ways: Field inspection is usually made by a trained committee, or by an officer of the College. Bin inspection is also made by an officer of the College. Samples must be tested by the State Seed Laboratory for purity and germination.

Members pay a membership fee of one dollar, which helps finance the organization. An inspection fee of two dollars for each field inspected, is charged.

The State Horticulturist of Colorado has, by law, charge of the registration of horticultural crops. The Seed Association only handles the Agronomic crops.

Georgia.

The Georgia Crop Improvement Association was organized and fostered by the Agronomy Division of the State College of Agriculture. Its purpose was to promote the agricultural interests of the State, more especially seed and crop improvement.

The membership is unlimited. It is selected by the Executive Committee from applicants. There is a membership fee of five dollars for individuals and ten dollars for Community Associations.

The requirements for certification are based on those of the Internation Crop Improvement Association.

The inspection service is done by the Seed Specialist of the College, the grower paying the actual expense of the inspection. Three grades of seed are recognized. These are; Elite, Registered and Certified. They are required to conform to the standards set by the International Crop Improvement Association.

Illinois.

The Illinois Crop Improvement Association is one of the older, well established organizations. It differs from most other Associations in, that it is Incorporated under the Laws of the State of Illinois. Also, in that the Agronomy Department of the College of Agriculture exercises no control over it. Until 1926 a member of the Agronomy Staff had acted as Secretary. At this time, the work was taken over by a farmer. The seed grain inspections are made at the College by an Inspector hired by the Crop Improvement Association. The College Staff acts only in an advisory capacity.

The Board of Directors meet annually with representatives of the College. They approve, for certification, only those varieties recommended by the College and Experiment Station.

The College Authorities consider that co-operation with the Association is the most satisfactory method yet developed, for the distribution of improved seed.

Membership in the Association is unlimited. It consists of active and associate membership. Active members are growers. They pay a fee of one dollar.

The rules for inspection are very rigid and the requirements high for both field and grain inspections. The inspection fee for clover and small grain is fifty cents per acre for the first 20 acres and twenty-five cents for each additional acre. The minimum fee is ten dollars per farm. For corn, the fee is seventy-five cents per acre for the first 20 acres, and twenty-five cents for each additional acre, with a fifteen dollar minimum per farm.

Four classes of seed of cereal grains are recognized: Elite

Registered, Certified and No. 1 Seed. The first three are essentially like the corresponding ones of other Associations. No. 1 seed is defined as seed of special merit, but which is not fully up to the standard set for Certified seed.

Three classes of seed corn and of soybeans are recognized: Elite, Registered and Certified.

The clovers are put into three classes: Certified, Approved and No. 1 Clover seed. The first two have been field inspected and found free of noxious weeds. Certified clover may contain 1/5 of one per cent of seeds of common weeds. It must have 98 per cent germination. Approved clover may contain 1/2 of one per cent of commonly considered harmless weeds and must have at least 95 per cent germination. No. 1 clover seed is seed which, upon field inspection, has failed to meet the requirements for either Certified or Approved seed, but which, upon laboratory examination, has been found to fulfill the requirements of the Illinois State Seed Law.

Indiana.

The Indiana Corn Growers Association, through its Certification Committee, carries on field and laboratory inspections and certification service.

Any Indiana farmer, who produces seed meeting the extablished standards, and who is a member of the Association, may have his grain certified. The annual dues of the Association are fifty cents.

The control of the Association is centered in the Soils and Crops Division of the College of Agriculture at Perdue. The Director of Extensions is Secretary-Treasurer of the Association and a member of

the Extension Staff is Chairman of the Seed Certification Committee.

The inspection is done by members of the faculty, and is financed by an inspection fee. For small grains, the fee is eight dollars for any acreage up to 20 acres, and 25 cents for each additional acre. For corn, an additional seed-house inspection fee of eight dollars for any quantity up to 200 bushels is charged and one dollar extra for each additional 100 bushels.

This Association mentions only one grade of seed known as Certified. New strains and varieties are distributed by the College, to men who expect to certify their seed.

No sales organization is maintained by this Association. This matter is left entirely in the hands of the grower.

Iowa.

The Iowa Agricultural Experiment Association is an organization of Iowa farmers. They cooperate with the State Experiment Station at Ames in carrying out simple but important experiments.

This Association authorizes the registration and certification of seeds meeting certain requirements. These requirements are essentially the same as those used by other Associations for like classes of seed.

The Association publishes an annual list of farmers having registered and certified seed for sale.

Kansas.

The Kansas Crop Improvement Association had its origin in the Kansas Corn Growers Association, organized in 1905. In 1914 the name was

changed to the present form and its activities broadened to include all field crops. It began active work in the distribution of Kanred wheat in 1918; and its success in introducing this wheat into all parts of the United States, and even to remote corners of the World, has been remarkable. Other crops have been added to this one, until at present, the Association supervises the certification of: corn, oats, wheat, barley, rye, vetch, sorghum, alfalfa, sweet clover and soybean seed. Other varieties are being added, as the growth and finances of the Association permit, and as their value is demonstrated by the Experiment Station.

This is an independent Association, the State and College having no control in principle. In reality, however, the College has almost complete control. The policies of the Association are formed by the members of the Experiment Station Staff in connection with the Board of Directors of the Association. Two members of the Board of Directors are also members of the College Agronomy Staff. The Secretary of the Association is a member of the Extension and Experiment Station Staff.

The annual dues for membership is one dollar. The inspection fee is three dollars for a field of 40 acres or less. For each additional 40 acres or less in the same field, 50 cents is charged. For each additional field of 40 acres or less, there is an extra fee of one dollar.

This Association spends several hundred dollars each year in advertising. The funds for this are obtained by a tax of approximately two percent of the total value of the seed sold.

The field and grain inspections are similar to those of other Associations, with only minor variations in their requirements. The seed

of some crops are certified without these crops having been planted with either registered or certified seed. However, they require evidence of these plots having been planted with pure seed.

The Kansas Experiment Station considers this a very effective method of increasing and distributing improved seed. However, the Station also produces a considerable quantity of pure seed on the Experimental farm at Manhattan and on the Sub-Stations.

Minnesota.

The Minnesota Crop Improvement Association is an organization of farmers, co-operating with the Agronomy Department of the University of Minnesota. It operates a system whereby a farmer, who is growing improved varieties of crops, may have his seed recorded by the Association and certification made, where it meets certain approved standards.

The membership fee in the Association is one dollar per annum. An inspection fee of two dollars is charged when application is made and a final two dollars for the grain inspection. The total inspection fee for any crop is four dollars, regardless of size of field.

The field inspections are made by the members of the Agronomy Department of the College. The tests for purity and germination are made by the State Department of Agriculture.

They use three terms for the classification of seed: Pedigreed, Registered and Certified. The first two definitions are essentially the same as those used by other Associations. Certified seed is, high grade seed which have passed a field and bin inspection, but which does not qualify as registered seed on account of not being directly desended from a seed plot.

The College and Experiment Station do not use this organization directly for increasing and distributing superior strains; though, as a matter of fact, these strains are usually sold to members of the Association. These members maintain these strains and offer them for sale in their own names.

The Association maintains no sales organization. It publishes annually, a registered and certified seed list.

Missouri.

The Missouri Corn Growers Association operates under the direct supervision of the Missouri College of Agriculture. It has three purposes in mind:

a. To stimulate the production of better seed by members of the Association.

b. To test the seed and to put the Association's official approval upon the best of it.

c. To advertise, officially, the approved seed and in every way to promote its use.

A grower, in order to get his fields inspected and his seed approved and listed, must be a member of the Association, the fee for which is one dollar per year.

In the case of small grains, the fields are inspected by representatives of the Association and of the College of Agriculture. In the case of, corn, soybeans, cowpeas, clovers and grasses, there is no field inspection - the approval of these being based on the sample inspection.

Improved strains developed at the College are put out as Elite stock seed to members of the Association. If this seed meets the requirements it is registered for the grower as long as it passes inspections. When it will no longer meet the standards for registered seed, but is still good enough, it is approved.

Kirkpatrick says (12) "The Association does not undertake the production and distribution of limited quantities of Pedigreed seed, nor does it undertake to sell through a difficult and rigid system of certification. It does, however, serve as an agency to distribute and increase superior strains produced by the Field Crops Department of the Missouri Agricultural Experiment Station".

Nebraska.

The Nebraska Crop Growers Association does certification work on the principal crops grown in that State. Through practically an independent organization, it is under the direction of the Agricultural College.

The usual inspections are made by a committee appointed by the President. Afterwards, the seed from fields which can be definitely traced to a known source, and which meet their requirements of purity and germination, are certified.

Life membership in the Association costs one dollar. An inspection fee of three dollars per individual is charged, regardless of the number of fields and varieties, provided they are all on one farm.

New York

The New York Cooperative Seed Improvement Association has been

in operation about two years. It is housed in one of the buildings of the College of Agriculture.

At present all seed inspection is performed by representatives of the College, and all Seed Analysis by the Seed Analist at Geneve. The College thus has control over the inspection service. The Association, however, is an independent organization and could use other inspection service. The relationship is purely voluntary on both sides, the service being paid for by the Association.

The College uses the Seed Association to insure the growing of pure seed and it recommends this seed to buyers. At present, the Association members grow only seed of varieties recommended by the College.

The Association is an effective means of increasing and disseminating improved seed. The College considers it far superior to placing the seed in the hands of individual growers.

North Carolina.

The North Carolina Seed Improvement Association has a membership limited to breeders and growers of pure seed. The Breeders are classified as such and the growers are required to come up to certain standards before they can become members. These standards require the growing of only one variety of the crop from which they sell seed and require the frequent return to the College, or a standard breeder, for a new supply of seed.

Seed are certified, based on the inspection of the crop, the freedom from disease and the germination.

The certification expense is borne partially by the growers on the basis of the acreage inspected and a part of it is supplied by

the State Seed Laboratory of the State Department of Agriculture.

The certification requirements are adopted by the Experiment Station. The State Seed Laboratory does the inspection.

An effort is made to supply some control over the seed of all crops; however, only varieties of proven merit are certified. Certificated seed from other States is not accepted until the variety has been tested under North Carolina conditions.

Director R. Y. Winters of the Experiment Station says: "The College is using this organization for the testing, improvement and distribution of improved seed. A few of our local organizations have employed trained Breeders that are doing splendid work. We feel that the future of seed improvement work is going to be principally a community problem. I hardly think that any State can produce seed that would be best adapted to a large area. We are attempting to establish the communities of our State in the improvement of their own seed, without much regard for the commercial side outside of the State".

Ohio

The Ohio Seed Improvement Association is an organization of growers and others interested in the production of high quality seed. Its purpose is to encourage the growing and distribution of pure seed of the best varieties throughout the State.

The Association is closely allied with the College of Agriculture in that an Extension Specialist of the College is Secretary of the Association. A representative of the Experiment Station and also a representative of the Farm Crops Department of the College is included on the Board of Directors of the Association.

The only control that the College or Experiment Station has over the inspection work is that the inspectors are trained by the Farm Crops Department of Ohio State University.

The College and Experiment Station depend largely on the work of the Seed Improvement Association for the increase and distribution of superior strains and varieties developed by them. They find this method of distribution entirely satisfactory.

The membership is unlimited, the annual fee being five dollars. The cost of inspection is six dollars for one field and one dollar for each additional field of the same crop inspected at the same time.

Two grades of seed are recognized: registered and certified. Registered seed are those which are as pure as can be found. Certified seed designates the bulk of the inspected seed. Crops grown from certified seed are not eligible for further inspection. The grower, whose crop is certified, is eligible for further inspection of his seed as long as they meet the requirements of the Association.

The Association publishes a list of growers having certified seed for sale, but does not maintain a seed-marketing agency. Arrangements are made authorizing established seed dealers to handle these seed in sealed bags. This enables growers to sell their entire output directly in one lot. The Association changes fifty dollars per year for this contract. The Secretary agrees to keep the dealers informed as to the available sources of seed and their purity. The dealers keeps accurate record of the source of his seed and to whom they are sold.

Oklahoma.

The Oklahoma Crop Improvement Association was rencetly organized and resembles very much the Michigan Association. Their requirements follow those recommended by the International Association.

This Association was organized under the leadership of the Oklahoma Agricultural College and is practically controlled by it.

SOUTH DAKOTA.

The South Dakota Crop Improvement Association, at present, only certified alfalfa fields and some wheat. Formerly many other seeds were included in their certification system. The Association has been reorganized and under the new system is confining its activities.

The College exercises no control over the Association except to fix standards and furnish the service of a member of the Extension Staff to act as Secretary.

All expenses of the inspection service is paid by the individual growers receiving the service.

Tennessee.

The Tennessee Crop Improvement Association was organized in 1924. It was patterned after the Virginia Association. The control of the organization is influenced largely by the College of Agriculture. A member of the College Staff is Secretary and Administrative officerof the Association. The officers of the Association work in close cooperation with the Experiment Station and Extension Divisions of the College.

The standards of classes and the requirements of the inspection service are essentially as recommended by the International Crop Improvement Association. The inspections are made by the Secretary, with some help from the Extension and Experiment Station workers.

A feature of this Association, not found in any other, is the fact that the Field Crops Department of the College has a fund, with which to carry on the work, originating from a private source.

The main effort has been to place superior seed, eminating from the Experiment Station, in the hands of qualified growers.

Virginia.

The Virginia Crop Improvement Association was organized by the Extension Staff of the Agronomy Department of the Agricultural College. A special appropriation of $5,000 per year is made by the State for its support. This State fund plus an inspection fee.

The head of the Agronomy Department of the College is on the Board of Directors of the Association. The office of the Secretary is with the Agronomy Department and the Agronomy Extension Specialists keep in close touch with the inspection work at all times.

The College and Experiment Station use the organization as the most effective medium for the increase and distribution of improved seed.

By a cooperative agreement, The Virginia Farm Bureau Federation maintains a seed department, which assists members of the Association in marketing their certified seed.

V. STATES HAVING NO ASSOCIATION BUT DOING SOME FORM OF CROP CERTIFICATION.

Idaho.

Idaho has a complete system of registration and certification. It is carried on by the Department of Agronomy of the University of Idaho.

The requirements for certification are based on the recommendations of the International Crop Improvement Association.

The inspection work is conducted by the Extension Agronomist, and is financed from the Extension budget.

Any grower may apply for inspection, through his County Agent, or directly to the Department of Agronomy. An inspection fee of $2.00 per field is charged.

Improved varieties are first tried out by high class farmers in the localities where they are thought to be adapted. In localities where they show merit, they are distributee through the County Agents, in larger lots. The seed are then certified and enter the regular trade channels. Under this system, all certified seed are both tagged and sealed.

Kentucky.

In Kentucky, the Agronomy Staff of the College of Agriculture inspected and listed fields of wheat, free of charge, from 1919 to 1924. The number of applications for this service gradually decreased. In 1925, actual expenses of this service was charged, and only one application was received.

Montana.

This State has a somewhat individual plan for carrying on certification. Ogaard (13) "The field inspection and seed certification

work is conducted in the name of the semi-official organization called the Montana Seed Growers Association. The policies of the Association are largely determined by the Agronomy Department. The Extension Specialist acts in the dual capacity of Secretary and 'Benevolent Despot'.

"New members of the Association pay $2.00 membership fee and $1.00 annual dues. This covers fees up to 10 acres of any standard variety, with an additional charge of 25 cents an acre for each additional acre".

The Experiment Station produces and turns over to the Extension Agronomist a limited amount of Elite stock. This is distributed among the best registered seed growers, who in turn, produce Registered Seed First Generation. Seed supplied in succeeding years are designated as Second, Third and Fourth Generation and thereafter, as Registered.

The field and threshed grain inspections are similar to that generally practiced.

Two grades of registered seed are recognized; No. 1 and No. 2. There is no Certified class in small grains.

New Jersey

In New Jersey, the Department of Agriculture has been taking care of the certification of corn. Wheat and rye will be added to the list this season, the same to be financed by funds appropriated to the Department.

Alfalfa certification is handled by the Alfalfa Association of New Jersey.

North Dakota.

The Agronomy Department of the North Dakota Agricultural College,

about four years ago, organized the Short Course students and have done some testing work.

The State Seed Law establishes a Pure Seed Commission and appropriates 2,000 dollars per annum for inspection and pure seed work. With this and the aid of a small inspection fee, this Commission is able to do a limited amount of certification and issue tags and seals for same.

This system has been in operation since 1909 for some crops, and quite extensively since 1911. They have had some trouble from unscrupulous growers selling seed that had not been inspected.

The North Dakota Grimm Seed Association is a non-profit cooperative organization, handling genuine Grimm alfalfa seed. The inspection and certification for this Association is handled by the Pure Seed Department. This is principally a cleaning and selling organization.

Oregon.

The Oregon Experiment Station, College and Extension Staff cooperate in the registration and certification of grains, grasses and potatoes.

All inspections except that of potatoes is a part of the Crop Improvement project of the Extension work. Potato inspection has been financed through a fee of six cents per bag for all potatoes passing final inspection.

Only recommended varieties are certified as a rule, but where communities insist on it good seed of other varieties are sought.

Outside sales are not particularly sought after and usually only enough seed to supply the local need is certified.

The College has maintained fairly high standards, and the work has resulted in a more general use of standard varieties. This is shown by the improvement in grades of grain passing through the Portland market.

Washington.

In this State a certain quantity of seed and seed grain is inspected by the Extension Staff. This is listed as a reference for those who desire to secure pure seed.

Wyoming.

In this State the Extension Specialist inspects fields of potatoes and some grains and certifies the seed

VI. ORGANIZATIONS HANDLING SEED OF ONE CROP.

There are numerous organizations throughout the United States that certify seed of only one crop. Some of these are closely allied with the Agricultural Colleges, while others are entirely independent. A few have for their main purpose the maintenance of a supply of high quality seed, whereas most of them combine this with a seed and commodity sales program.

Potato Associations.

Seed Improvement Association of Main. This organization works more or less independently in the distribution of good potato seed. The State Department, however, does most of the inspection work.

The Michigan Potato Growers Exchange. This organization is closely allied with the Michigan Crop Improvement Association. Its certification work is carried on through the latter organization.

The New Hampshire Potato Growers Association. This organization works with the Extension Agronomist of the University of New Hampshire in the certification of potato seed.

The New York Cooperative Seed Potato Association. This organization is allied with the Grange League Federation of New York. It handles the certification and sales of potato seed.

The Pennsylvania Potato Growers Association. This organization is interested, chiefly in the sale of potato seed. They cooperate with the Pennsylvania State College Extension Department in the certification of seed.

The Vermont Certified Seed Potato Growers Association. This is a voluntary association of growers interested in growing and marketing seed potatoes. The certification work is handled by the Vermont Department of Agriculture.

Alfalfa Associations.

Associations of this crop are found in North Dakota and Idaho. They are known as Grimm Alfalfa Associations. The Idaho Association has a very efficient and effective organization, which certifies and handles an immense amount of seed each year.

Soybeans.

South Carolina has a Soybean Growers Association. It has a well organized system of certification and sales.

Cotton

The Temple Cotton Exchange of Arizona handles the certification and distribution of Pima cotton.

VII METHODS OF HANDLING IMPROVED SEED WITHOUT CERTIFICATION.

In a number of States, the Experiment Station Plant Breeders and the Extension Workers have developed systematic methods of distributing improved seeds without certification.

The Mississippi Experiment Station sells its improved seed under contract with interested growers. These growers are selected by County Agents. They are allowed quantities large enough to plant one tenant's crop. The Station employees inspect the fields and assist in disposing of the seed. The grower keeps the seed pure and retains one third of the seed produced for his own use. The other two-thirds are sold by the grower to persons named by the Experiment Station. After this transaction, the Station maintains no further control over the seed.

The Texas Experiment Station (14) places their seed with reliable persons for growing under supervision. The seed are then sold to farmers at reasonable prices. Supervision is continued until the particular variety has been put before the public safely and the seed are available in commercial quantities.

In Arizona, superior strains of seed are placed in the hands of reliable farmers by the County Agents. The increase coming from such seed is distributed under the supervision of the County Agent among other farmers. This is done with the understanding that a certain portion of the seed is to be reserved for further distribution by the County Agent.

The Pennsylvania Extension Agronomist, cooperating with the County Farm Bureau Representatives, aid in testing and distributing improved varieties developed by the Experiment Station, as well as promising varieties secured from other sources.

VIII. THE INTERNATIONAL CROP IMPROVEMENT ASSOCIATION.

This Association was the result of a meeting held at St. Paul Minnesota, July 11, 1919. By invitation from Professor C. P. Bull of Minnesota, a meeting was held with the following States represented: North Dakota, Minnesota, Michigan, South Dakota and Wisconsin. The need of cooperation between the Associations had been felt by a number of leaders.

This meeting brought out the benefits to be gained from a close relationship of various Associations, so another meeting was called. It met on Dec. 2nd, at Chicago, at the time of the International Hay and Grain Show. All known grain and crop associations were invited to send representatives.

On the program at this meeting, discussing the activities of their Associations, were the following: C. P. Bull of Minnesota; J. W. Nicolson of Michigan; B. S. Wilson of Kansas; A. L. Stone of Wisconsin; and H. D. Hughes of Iowa. The states represented by one or more persons were: Indiana; Illinois; Iowa; Kansas, Louisiana, Maryland, Michigan, Minnesota, Missouri, Montana, Ohio, South Dakota, Wisconsin and Canada. At that time all of these states, except two, had some kind of farmers organization interested in seed improvement.

After considerable discussion, the International Crop Improvement Association was formed. The following officers were elected: President R. A. Moore of Wisconsin; 1st Vice-President, H. G. Cutler of Edmonton, Alberta; 2nd Vice-President, Manly Champlin of Brookings, South Dakota; 3rd Vice-President, John Buchanan of Iowa; Secretary-Treasurer, J. W. Nicolson of Michigan.

This organization, working through committees, has set standard classes of seed and defined the qualifications for them. Many states have adopted these standard regulations and others are falling in line.

The Association meets every year during the International Hay and Grain Show at Chicago. It has formed a common meeting place, thereby, creating a better understanding and acquaintance between the various workers. This contact has led to much cooperation that could not have been otherwise brought about.

IX. GENERAL DISCUSSION

The kind of seed used by the farmers of the United States is an important factor in the welfare and prosperity of the Nation. The total value of the seed planted in one year is enormous and any slight increase in their productiveness would be worth billions to the country.

Ohio (5) estimates, that, could she but get 50 percent of her farmers to use better cereal and forage seeds and potatoes, the increased income to the farmer would amount to a minimum of thirteen million dollars annually.

It might be argued by some that the commercial seed dealers of the country could handle the situation and that the pure seed work should be left in their hands. The fact remains, however, that they have, with few exceptions, paid no attention to adaptibility, and have emphasized only such pure varieties as the individuals had control of. They have given no guarantee, except such as is required by state seed laws.

What is most needed by the purchaser is a guarantee that he is getting seed true to variety and adapted to his section. In a survey of 26 of the leading seedmen of the Middle-West, 23 have the universal guarantee. This guarantee is: They give no warranty, expressed or implied, as to description, quality, productiveness, or any other matter of any seed bulbs or plants they send out. They will not be in any way responsible for the crop. If the purchaser does not accept the goods on these terms, they are to be returned. Three of these seedmen are employing plant breeders and give some guarantee as to the purity of the varieties.

Gore (6) says that color and freedom from dirt or other foreign matter, or similar qualities ordinarily easily determined upon objectional examination, are ordinarily the basis of commidity standards. These qualities are of far less significance than those of trueness to type, place of origin, and viability in determining the value of planting seed.

Ordinarily there is no rule by which we can purchase seed and have any certain knowledge of what we are getting. The seed catalogues are wonderful examples of printers art, but carry no definite information of value to guide the purchaser. We find generalized statements, vivid descriptions, etc., every seedman usually emphasizing his special strain.

In the above survey, we find one company advertising: 39 varieties of string beans; 29 of cabbage; 15 of lettuce; 29 of peas and 30 of tomatoes. Another company recommends by glowing pictures and descriptions: 54 varieties of beans; 18 of cabbage; 17 of lettuce; 26 of peas and 27 of tomatoes. A third company shows: 13 leading varieties of oats; five of barley; 19 of corn and 19 of tomatoes. It would certainly be confusing and rediculous for a farmer, desiring tomato seed, to get these three catalogues and attempt to decide which of the

67 varieties he should choose.

Many seedmen grow their seed with special effort to keep them pure. Some maintain trial grounds where they test different strains. However, where all seed are sold under no other guarantee than the standard quoted above, the purchaser has no way of discriminating between the scrupulous and the non-scrupulous dealer. Practically all commodities on the market carry guarantees as to their quality and there is no sufficient reason why seed should not.

It is true that seedmen take a great risk in buying large quantities of seed on future delivery. They cannot always know in advance, just what to expect. However, this is the Seedman's risk and should not be passed on to the purchaser. There may be a few seed on which the dealer could not give definite guarantees, but there is no reason why seed produced in the United States could not carry guarantees of variety and adaptation.

The production, maintenance and distribution of improved seed is naturally a part of the activities of the Agronomy Departments of the Agricultural Colleges.

Smith (5) says: "Upon the Agronomy Department of the College falls the burden of duty of: a. Introducing and developing seeds adapted to the needs of the State; b. Multiplying these seeds in the hands of careful men in each region and county of the State, so that a supply of the improved seed is within reasonable reach of every farmer; c. Putting on a campaign through the Extension Service to get the variety planted on every farm to which it is adapted; d. Making arrangements with seed dealers or farmers' organizations within the State to bring in only such for general distribution within the State as the Agronomy Department

recommends; and e. To assist in developing a State Seed Association if such association is needed to supply seed to miscellaneous farmers and farmers from outside the state who may want good seed.

"The Agronomy Department must be strong in research work of breeding and testing out varieties and must follow up every variety it puts out to see that there are always a few breeders in each county who keep the seed supply pure and ture to name".

It would be very difficult to choose any one Crop Improvement Association or system of registration as a model. Many of the Associations that differ materially in their organization and activity are equally successful. The most sufcessful Associations, however, have a few things in common:

a. They are very closely united with, if not completely controlled by State or College officials.

b. The qualifications for certification are high. They usually conform to standards recommended by the International Crop Improvement Association.

c. The inspections are made by members of the Staffs of the: College, Experiment Station, or Extension Service.

d. Extreme care is used in the sealing and taging of seed bags.

e. Assistance in marketing is given, either through maintaining a Sales Department, or through cooperation with some other sales agency.

The organized movement to maintain superior seed has accomplished some outstanding results.

The International Association has correlated the efforts of the several Associations, created a general public interest in better seed and assisted in the passing of recent seed legislation.

As early as 1913, Newman (8) called attention to the growth of the trade in registered seed in Canada, and said: "The superiority of registered seed over ordinary seed in regard to such matters as: yield, purity and uniformity of growth and maturity, has everywhere been demonstrated during the past season".

Michigan (5) estimates the planting of 600,000 acres of improved cereal seed, including corn and beans, annually. This results in an increased income of nearly two million dollars to the farmers of the State. The substitution of Grimm and Hardigan alfalfa for clover has been worth, to farmers of Michigan, over eight million dollars. This makes a total average of over $50.00 per farm, becuase of better seed.

Nebraska (5) estimates about 5,650,000 acres of cereals planted to improved seed with an average money value of at least $7,825,000 annually. No one knows how much of this gain is offset by farm losses due to unknowingly planting unadapted clover and alfalfa seed from Italy, Peru and the Argentine.

Iowa gives data showing that in 1924 there were grown over 2,667,000 acres of improved oats alone. The increase from this acreage was over eleven million bushels. About 46% of the entire oat acreage of the state was from Station improved seed.

X. SUMMARY.

There is a great need for more production of seed in the United States and Canada.

There is a great need for a larger supply of guaranteed seed in the United States and Canada.

The United States Department of Agriculture, the State Colleges and the Experiment Stations have accomplished much in both production and testing of seed.

The putting out of improved seed without a definite organization to: increase them, introduce them and maintain their purity has proven unsatisfactory.

Commercial seed dealers have not filled this need.

Crop Improvement Associations and similar organizations, established in Canada and in many States, have had much success in meeting this need.

The Colleges, Experiment Stations and Extension workers have, to a large extent, taken the leadership and responsibility of supervision of these organizations.

It is considered necessary that certification of varieties carry with it some form of Official Government approval.

Well organized and supervised Crop Improvement Associations, cooperating with all agencies for better seed production, are recommended for every state.

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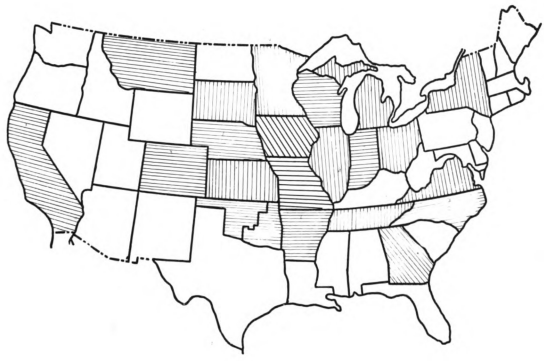


Plate 1. States having some form of seed improvement association.

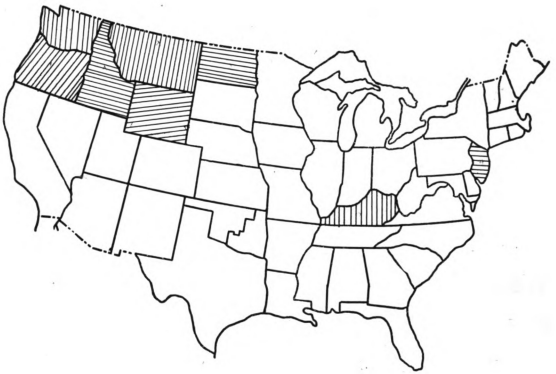


Plate 2. States having no seed improvement association, but doing some form of certification.

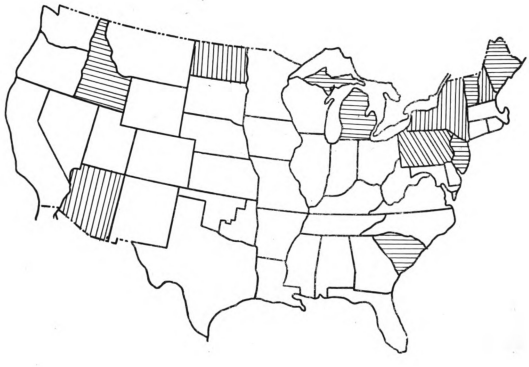


Plate 3. States in which there are organizations handling seed of one crop.

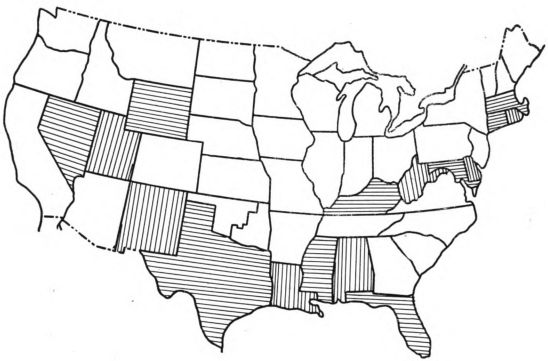


Plate 4. States in which no certification work is carried on.

Plate 5. Tags used on potatoes by Michigan Crop Improvement Association.

MICHIGAN CROP IMPROVEMENT ASSOCIATION

Certificate of Origin

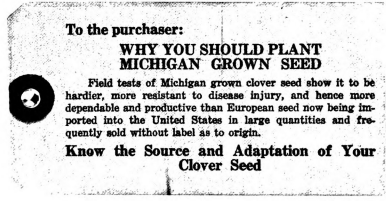
This is to certify that a representative of the Inspection Service of the Michigan Crop Improvement Association has inspected Lot No.....

.....clover seed and examined the shipping and handling records from the local point of origin to the final cleaning and placing of the seed in sealed bags.

These records show that the seed was grown seed assembled at a Michigan shipping point.

Affidavits covering the origin, handling, and cleaning of this seed are on file in the office of the

MICHIGAN CROP IMPROVEMENT ASSOCIATION,



To the purchaser:

WHY YOU SHOULD PLANT MICHIGAN GROWN SEED

Field tests of Michigan grown clover seed show it to be hardier, more resistant to disease injury, and hence more dependable and productive than European seed now being imported into the United States in large quantities and frequently sold without label as to origin.

Know the Source and Adaptation of Your Clover Seed

Plate 6. Tags used on clover seed by Michigan Crop Improvement Association.

Michigan Crop Improvement Association

PEDIGREED GRAIN INSPECTION

Copy For Grower

NAME .....

Address .....

County..... Date.....

Variety .....

From whom obtained? .....

When?..... Seed treated for smut?.....

Diseases, per cent of each.....

Insects, per cent of each.....

Noxious weeds .....

.....

Mixtures—kinds and amounts.....

.....

Kind of soil..... Is drainage good?.....

Fertility ..... Previous crop.....

Preparation seed bed..... Amt. manure.....

Amt. and kind of fertilizer.....

Amt. and kind of grass seed per acre.....

Other varieties similar grain.....

Threshing method to be used.....

Acreage..... Time of seeding.....

Amt. seed per acre..... Stand..... Vigor.....

Estimated amount for sale.....

Passed..... Rejected.....

Remarks .....

.....

.....

.....

.....

.....

Inspector.....

Plate 7. Form used for field inspection by Michigan Crop Improvement Association.

MICHIGAN CROP IMPROVEMENT ASSOCIATION

PEDIGREED GRAIN INSPECTION

COPY FOR GROWER

This is a report of the seed condition of the sample

of.....
(variety and kind of seed)

submitted by.....
(name of grower)

which he guarantees to be representative of the seed of this variety that he has for sale.

Date.....County.....

Address.....

Weight per bu.....Color.....

Mixtures.....

Weeds.....

Foreign Material.....

Diseases.....

Yellowberry.....% Shrunken Seed.....% Cracked Seed.....%

Small Seed.....% Large Whole Seed.....%

Moisture.....% Germination.....%

Disposition..... No. Assigned.....

Remarks.....

.....

.....

.....

.....

.....

.....

.....

Inspected by:

....

Plate 8. Form used for threshed grain inspection by Michigan Crop Improvement Association.

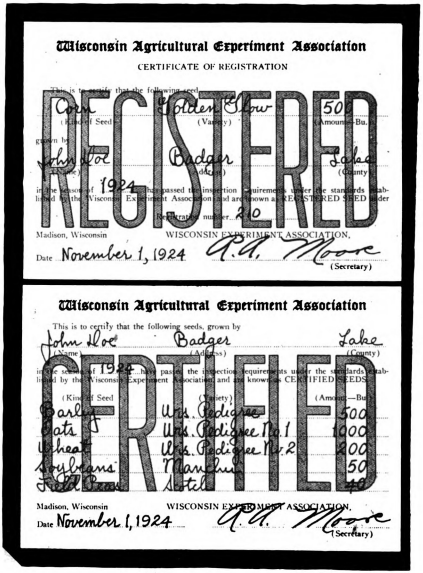
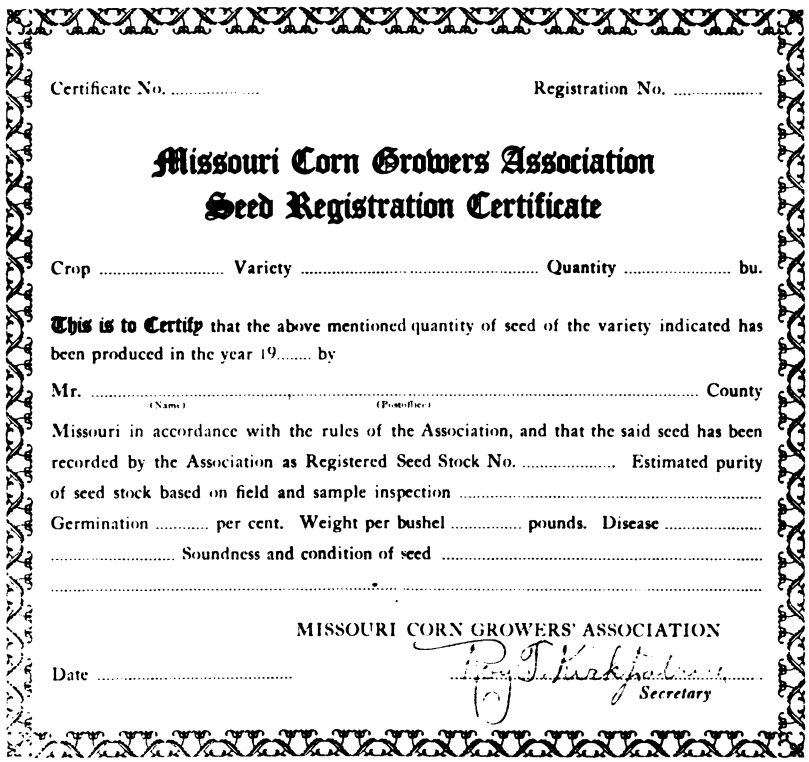


Plate 9. Form of tags used by Wisconsin Agricultural Experiment Association.



Certificate No. ..... Registration No. .....

Missouri Corn Growers Association
Seed Registration Certificate

Crop ..... Variety ..... Quantity ..... bu.

This is to Certify that the above mentioned quantity of seed of the variety indicated has been produced in the year 19..... by

Mr. ..... (Name) ..... (Postoffice) ..... County

Missouri in accordance with the rules of the Association, and that the said seed has been recorded by the Association as Registered Seed Stock No. ..... Estimated purity of seed stock based on field and sample inspection .....

Germination ..... per cent. Weight per bushel ..... pounds. Disease .....

..... Soundness and condition of seed .....

.....

MISSOURI CORN GROWERS' ASSOCIATION

Date .....

..... Secretary

Plate 10. Certificate issued by Missouri Corn Growers Association.