

Alfalfa Seed Production

By

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Introduction

Alfalfa is an important crop in Montana and ranks next to wheat in the total annual income derived from the seed and feed it produces. Its value is taken for granted and little is done to make the crop produce maximum returns. Alfalfa seed is occasionally produced in all sections of the state, but it is best adapted to the eastern part of Montana and the Flathead area in Sanders county. Growing alfalfa for seed fits in with the production of range livestock and has a stabilizing influence on livestock production in Montana. The production of alfalfa seed is a side line and not a major enterprise. As such its value increases, for at best the production of seed is uncertain, for only when conditions are right is seed produced. Some factors affecting seed production may be controlled, others cannot. In this bulletin there are set forth some suggestions and recommendations which producers of this commodity have learned through years of experience in producing seed.

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Adaptation

Alfalfa seed is being produced on all types of soils found in the seed producing area. A sandy loam soil of sufficient depth to allow the alfalfa roots to penetrate deeply will give the best results. Avoid shallow soils with hardpan layers. Bottoms, draws, and coulees make ideal locations for alfalfa fields. Bottoms that flood during the spring runoff, or that can be placed under a flood irrigation system, offer ideal locations for planting alfalfa for seed production. Alfalfa in rows on benchland has produced good yields when moisture conditions were favorable. This system still has possibilities. Alfalfa is a heavy user of water and will produce best when the average annual precipitation is 15 inches or over. When less moisture than this is available, thought should be given to locating fields where some advantage can be obtained from drifted snow, flooding, and run-off water. A little additional moisture often means the difference between a crop of seed and a failure.

Alfalfa Varieties and Quality Seed

If Montana is to maintain its reputation as a producer of quality alfalfa seed, then more time and effort must be spent on producing this crop. Nearly all seed produced at present is Grimm, Cossack, Ladak, Ranger or Montana Common. The first four named varieties are all registered by the Montana Seed Growers association.*

Varieties

Ladak.—The highest yielding variety of alfalfa in areas of Montana where one or two crops of hay are produced annually.

*The Montana Seed Growers association is a growers' organization which handles the regulatory work in the registration of small grains, legumes and grasses.

It is winter hardy, drought resistant and moderately resistant to bacterial wilt. It is a variegated alfalfa with a high percentage of yellow and white blossoms. This variety was introduced from India, and grown at the North Montana Branch Station at Havre, where the seed supplies were produced for distribution in Montana.

Grimm.—A variegated variety which yields slightly less than Ladak and Cossack, but is recommended because of its wide adaptability and generally good performance under Montana soil and climatic conditions. It is not resistant to alfalfa wilt. This variety was developed by W. Grimm in Minnesota from some seed introduced from Germany.

Cossack.—A variegated variety similar in appearance to Grimm, but with greater variegation of blossom. It is recommended generally for Montana because of hardiness, drought resistance, and yielding ability. Cossack is less resistant to bacterial wilt than Ladak. This variety was developed by the South Dakota Agricultural Experiment Station.

Ranger.—A new variegated and wilt resistant variety of alfalfa developed by the United States Department of Agriculture in cooperation with various agricultural experiment stations represented in the Alfalfa Improvement Conference. It is second to Ladak in yield of hay at Bozeman and is superior to the other recommended varieties in seed production. While it is recommended primarily for seed production to supply eastern markets, it may also find a definite place in the irrigated areas in Montana as a hay crop.

Ranger alfalfa seed production for registration differs somewhat from the system used in registering Ladak, Cossack and Grimm. Its value depends on maintaining its resistance to bacterial wilt. Unless this is accomplished the purpose for which it was released will have been defeated. In Montana the following procedure will be followed:

1. All fields planted for seed must be $\frac{1}{2}$ mile from any other variety of alfalfa.
2. Ranger (Syn. 1) is the only generation of seed which is eligible for certification in Montana.
3. All applications for planting must be made through the County Extension Agent's office.
4. All fields must be inspected and the seed produced tagged and sealed by the Montana Seed Growers association.

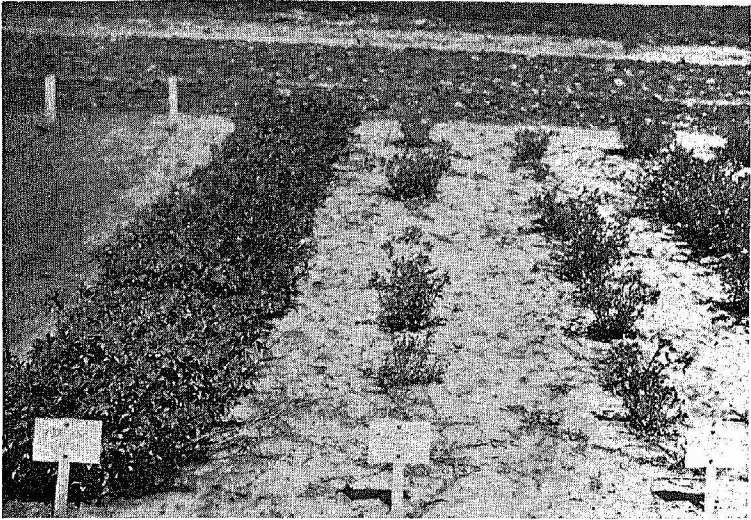


Fig. 1.—Foreign seed, except Canadian, is unadapted. Note the excellent stand of Montana Grimm on the left and the poor stands, because of winter killing, in the second and third rows of Argentina seed and the fourth row of Hungarian seed. **KNOW WHAT YOU SOW.**

Unless Ranger alfalfa is certified by the certifying agency in the state in which it is produced, the producers in the consuming area cannot be certain of its resistance to bacterial wilt. A very strict adherence to the above procedure will be followed.

Montana common alfalfa is a term applied to all unregistered alfalfa. The genuine common alfalfas produce purple blossoms. However, most fields of so-called common alfalfa in the state have variegated blossoms, indicating they are either Grimm or a mixture of common and Grimm or Cossack.

All of these varieties produce good seed and have a wide area of adaptation in hay producing areas. To maintain the advantages which Northern grown seed has earned, because of its hardiness and quality, some effort must be exerted to: first, increase the acreage devoted to seed production; and, second, to raise the general standard of the quality of seed offered for sale.

Unless fields are kept clean of noxious and other weeds, the seed of which is difficult to clean out of alfalfa seed, the quality will certainly suffer. Alfalfa fields should be established on clean land with clean seed and rogued to keep them clean.

Montana grown registered alfalfa seed is the cheapest and the best seed to plant—cheapest because it takes less per acre when

you use seed of known purity and germination—best because it is graded, tagged and sealed, assuring the producer of what is in the bag. Whether alfalfa is planted for the production of hay or for seed, it pays to plant the best seed available.

Seed Bed Preparation

Alfalfa should be planted on a firm, clean and moist seedbed. Summerfallow, corn, beet, or bean land furnish excellent seedbeds. The land should be free from weeds. If it is necessary to kill weeds prior to seeding, cultivate as shallowly as possible. If the soil is too loose after cultivation, the land should be packed. Much alfalfa seed is lost when planted on a loose seedbed. This accounts for the belief that seeding large poundages per acre are essential to a good stand. Do not plant alfalfa in a dry soil. Delay seeding until moisture is present. Alfalfa has a hard seed-coat and seldom furnishes a stand after laying in the ground for a long period. Many times



Fig. 2—Alfalfa drilled on creek bottom at 1 to 2 pounds of seed per acre produces a thin stand of large individual plants. Keep alfalfa stands thin for seed production.

a shower furnishes enough moisture to swell the seed and start germination, but not enough to establish the plant in the soil. A firm soil, filled with moisture, free from weeds and weed seeds, with a cloddy surface mulch of one-half to an inch in depth are the

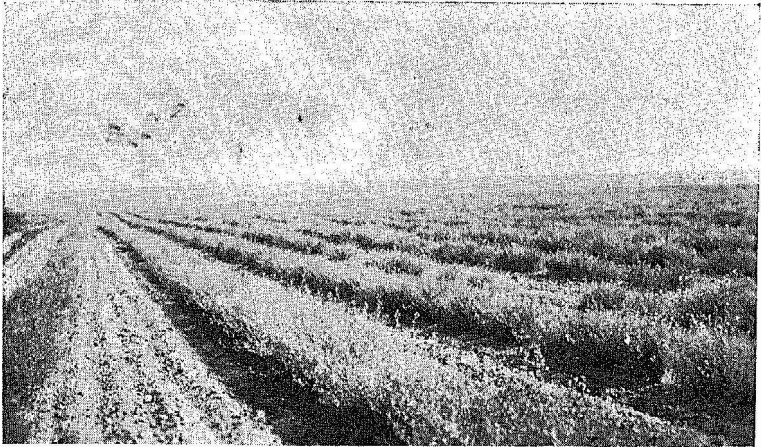


Fig. 3—Alfalfa for seed in 7-foot rows on benchland produces large individual plant growth conducive to seed production.

requirements for a good alfalfa seedbed. It is far better to keep the seed sealed in the bag than to sow it on a poorly prepared seedbed.

Rate of Seeding

Low rates of seeding are essential in alfalfa seed production. Large individual plants produce the seed and for this reason thin stands are essential. When planted on benchland in rows, from 7 to 10 feet apart, it should be planted at the rate of one-fourth to one pound per acre.

When planted on creek bottoms that get an annual spring flooding or that are under a flood irrigation system, one to three pounds per acre is sufficient. On land that has a controlled system of irrigation, three to five pounds of seed per acre is the rate recommended for seed production.

Time of Seeding

Alfalfa should be seeded from April 15 to May 15. The earlier seedings are best, provided the season breaks early and there is little danger of heavy freezing. Under flood or controlled irrigation systems, fall seeding in stubble is recommended. Moisture is the limiting factor in successful fall seedings. Seedings should be made as soon as the grain crop has been removed to allow the young alfalfa plants to become well established before winter.

Method of Planting

Planting should be made in a firm soil containing enough moisture to germinate and establish the plant. Alfalfa seed should

be planted from one-half to one inch deep and the soil firmly packed. On heavy soils alfalfa seed should be planted shallowly. On benchland, alfalfa should be planted in rows 7 to 10 feet apart. The spacings should be of such width as will make it easy to cultivate with implements at hand. On bottoms that flood intermittently or that are under a flood irrigation system, the general practice is to drill or broadcast the seed. The same methods apply to controlled irrigation.

In row seeding, for small areas, the small garden seeder serves the purpose. On larger areas the corn planter equipped with a home-made attachment is often used. This attachment (Fig. 4) can be made from parts of a grass seed attachment on the grain drill. The regular grass seed attachment on the drill may be used by plugging the proper outlets. When the corn planter attachment is used, blocks should be bolted on each side of the planter shoe to

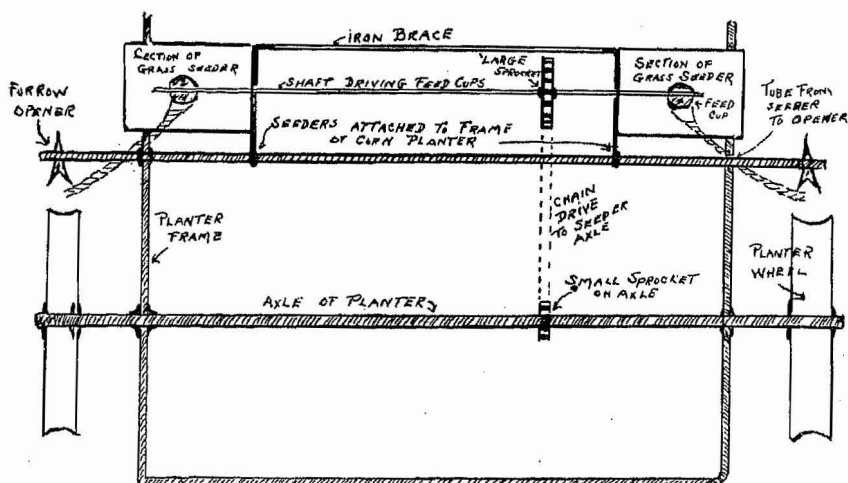


Fig. 4—Diagram of a row seeder attachment for use on a corn planter. The attachment was worked out by Grover E. Lewis, former extension agent for Prairie county, and has been used extensively in all alfalfa seed areas of Montana.

avoid planting too deeply. Close drilled alfalfa should be seeded through a grass seed attachment. Drilling is preferable to broadcasting as it permits a more even distribution of the seed on the land and insures seeding at an even depth.

Whenever it becomes difficult to seed at a low enough rate per acre, the seed may be diluted with fine coal screened to the size of alfalfa seed or with millet seed that has been baked in an oven for two hours to kill the germination of the seed.

Nurse Crops

Alfalfa should be seeded alone on benchland. The alfalfa stand should be the first consideration. Do not divide the moisture supply between two crops. Some weeds will appear, but they will do less harm than the planted grain crop. The weeds should be clipped as soon as they are high enough to cut with a mower.

Under flood irrigation, a nurse crop may be used if the soil is inclined to wash and there is reasonable assurance of sufficient flood water to serve both crops. Where there is doubt, seed the alfalfa alone. Under controlled irrigation, alfalfa planted for seed may be seeded with or without a nurse crop. Seeding without a nurse crop is gaining in favor. If a nurse crop is used, seed at one-half to two-thirds the regular rate of seeding small grain per acre. Irrigate to keep the young alfalfa plants growing and disregard the small grain. Cut the small grain for hay.

Cultivation

Cultivate alfalfa each year to control weeds and to keep a thin stand. For this work the springtooth cultivator equipped with alfalfa teeth is an ideal implement. Cultivate as soon as the ground can be worked in the spring. This will give an even weed germination and close the cracks in the soil to prevent moisture losses. From one to four cultivations may be necessary. The springtooth can be used for the first and possibly the second cultivation. Subsequent cultivations on row alfalfa can be made with a corn cultivator equipped with knife blades.

If old stands get too thick, the double disk should be used. Thick stands do not produce the best yields and regular cultivation will prevent thick stands.

Where moisture is very limited, many producers hold back growth until May 20 to June 1. This may be accomplished by continual cultivation. Some growers use a heavy plank float. This system helps conserve moisture.

Application of Water

The careful application of water on alfalfa for seed production will increase yields. Carelessly applied water becomes a detriment. Seed production in alfalfa requires a slow even growth with the plant reaching the blossom and setting period in a hardened condition. Washy rank plant growth is not conducive to seed production. The soil texture and seasonal conditions will determine the time and amount of water to apply. Each alfalfa field becomes an individual problem and must be handled according to the producer's knowledge of the growing habits of the plant.

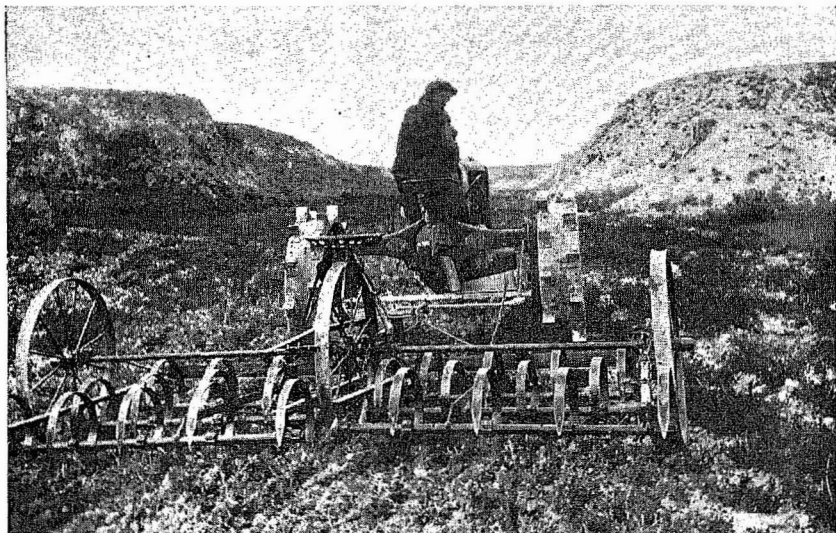


Fig. 5—The springtooth harrow equipped with narrow teeth is an excellent implement to use in cultivating alfalfa.

Under a flooding system, where the supply of water is spasmodic, one good soaking in the early spring will generally suffice. If the first growth is rapid and washy, it should be cut for hay and the second growth left for seed. Flood irrigation systems should be constructed so flood waters can be diverted at certain periods of growth.

Under a controlled system if irrigation several light irrigations should be given. A moderately heavy irrigation may be given as soon as the water is available in May. When the first crop is left for seed, frequently no more applications will be needed. Careful and frequent observations of the soil moisture and plant growth are necessary. If conditions indicate that further applications of water are necessary, producers generally feel that the best results

are obtained with the second application being made when the plant is in the budding stage, prior to bloom, and if necessary the third application may be made after the pods are formed.

Too much water stimulates rank growth and causes the blossoms to drop. Not enough water causes plants to "burn." A producer must attempt to keep soil and plant conditions favorable to seed setting.

Seed Setting

"The more you know about alfalfa the less you know about its tendency to set seed, but in the aggregate it will surprise you more often than it will disappoint you." If this statement is always kept in mind there will be little necessity for losing faith in alfalfa seed production. Alfalfa comes into blossom 30 to 45 days after growth starts. It will remain in full bloom over 10 days. If the bloom remains fresh without any sign of withered blossoms that hang on the stem, the alfalfa should be cut for hay. Best seed sets are obtained when tripping starts within two to three days after the flowers reach the full bloom stage. Blossoms start to wither soon after tripping. Withered blossoms pulled lightly between the fingers give an indication of whether the blossoms will stick on the stems and form pods. If the withered blooms slip off easily or many bare blossom stems are evident, little seed is likely to be produced. Alfalfa plants reach their peak production the second year.

Harvesting

Alfalfa should be harvested when one-half to two-thirds of the pods have turned brown. Care should be taken to avoid the loss of pods by reducing the handling as much as possible. The self-reaper and header are the most satisfactory implements to use in harvesting. Implements such as the mower equipped with a side delivery or a catcher and the combine, are used. The use of the combine makes it necessary to leave the alfalfa standing too long. Also there is the danger of frost, uneven ripening and weather discoloration. All harvesting machinery should be equipped with pea guards to lift the alfalfa up to the sickle. After cutting, leave the alfalfa in small flat shocks until it is dry enough to stack.

Stacks should be long and narrow and not too high. Stacking should be done when the alfalfa is tough. Many growers start several stacks at once and place alternate loads from the fields on the stacks. This allows for additional curing and natural settling. Alfalfa for seed should not be tramped in the stack. A sled or low truck chassis with a solid bottom rack will reduce the loss of pods. Load and unload with care. Alfalfa should remain in the stack from two to three weeks.

Threshing

A huller is the best implement to use for threshing alfalfa seed because it is built for this type of work. The grain separator equipped with alfalfa seed screens will do a good job with some adjustment. All concaves should be used and set close and the speed of the cylinders reduced one-third. The air should be regulated to prevent blowing out seed and seed pods. Such screens should be used as will permit all seed to be carried over to the recleaner where the unthreshed seed pods will be carried over to the cylinder for rethreshing. Check the straw pile often. It is better to do a dirty job of threshing than to put half the seed in the straw pile. Many times it is profitable business to rethresh straw piles. The combine has been used with good results by many growers for threshing from shocks and stacks.

Seed should not be threshed until it is thoroughly dry. If damp when threshed and then sacked the germination will be materially lowered by heating. If the seed or straw is damp, the seed should be cleaned immediately.

Alfalfa seed of high purity requires a good job of cleaning. The gravity cleaner is almost essential to clean seed well enough to make the blue tag grade. All authorized cleaning plants are equipped with gravity cleaners.

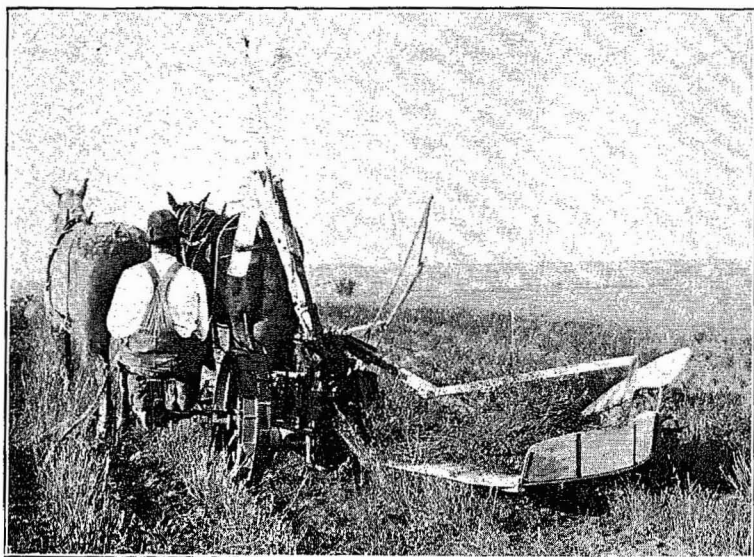


Fig. 6—The self-reaper reduces harvesting losses to a minimum. Cut for seed when one-half the seed pods are brown.

Cleaning

Alfalfa seed should be cleaned while growing in the field. A good job of roguing the fields of all legume and weed mixtures will naturally increase the quality of the seed.

Alfalfa seed should be cleaned immediately after threshing. Such cleaning may be done on the farm if a good clipper cleaner is available or may be cleaned at a cleaning plant. All seed should be cleaned ready for sale. Uncleaned seed often-times leads to unsatisfactory sales. Dockage can be held to a minimum only when straw and chaff is all that must be removed.

Registered Seed

The Montana Seed Growers association, a growers' organization, is in charge of the inspection and registration of all small seeds and small grains in Montana. The association is governed by a board of directors composed of growers elected from the membership. Each grower becomes a member by paying annual dues.

There is a need for a large expansion in the production of registered alfalfa seed in Montana. Registered seed can be produced at a nominal cost above common seed. While it is true that registered alfalfa must make Blue or Red to be sealed and tagged, yet all common seed is sold on a clean basis. With the normal premium usually paid for registered over common seed the extra care necessary returns a good dividend. A few of the major requirements and methods of producing registered seed in Montana are:

1. Land seeded with alfalfa for registration must be free from any alfalfa plants.

2. Land must be seeded with seed that has been tagged and sealed with a Blue or Red tag of the Montana Seed Growers association. Alfalfa seed from other states and provinces is not eligible for registration in Montana.

3. Fields must be inspected the year they come into production.

4. Common alfalfa on any land owned or controlled by the producer must be cut for hay.

5. Alfalfa seed must be cleaned to grade. Time and money will be saved by having seed run over a gravity cleaner at an authorized cleaning plant.

6. Seed must not leave the owner's possession for transport to an authorized cleaning plant unless it is sealed with a temporary seal and each bag marked or tagged.

7. Very few growers ever clean their seed to a satisfactory grade, unless a gravity cleaner is employed.

8. The following grades are sealed and tagged as registered:

Fancy—Blue Tag—Purity not less than 99.5 percent. No noxious weeds. Sweet clover tolerance 90 seeds per pound. Good appearance and color.

Choice—Red Tag—Purity not less than 99 per cent. Sound, plump seed. Slightly lower standards as to appearance and color than for Blue tag. No perennial noxious weeds (tolerance of nine seeds per pound for fanweed and wild mustard). Nor more than 1/16 of 1 per cent sweet clover (180 per pound).

Note.—Noxious weeds referred to in the above grades are dodder, wild mustard, white top, Canadian thistle, buckhorn, perennial sow thistle, fanweed, quack grass, leafy spurge, blue lettuce, wild morning glory and Russian knapweed. A tolerance of 1/2 of 1 per cent of inert matter not materially affecting appearance of seed is permitted in above grades.

Marketing

Montana has always had a good outlet for alfalfa seed. The alfalfa cooperative marketing associations have always marketed to good advantage. Local buyers for seed houses in the consuming areas have been a factor in the marketing field. Both types of marketing depend for their success on volume or carload lot production. Small lot and broken carload lots increase the marketing cost and cut down the price to the grower.

The Montana Seed Growers association which supervises the inspection, registration and sealing of all registered alfalfa is not a sales organization. All inquiries about purchases are referred to

marketing associations, authorized cleaning plants, and growers who retail their seed. The association does carry on an advertising campaign in an attempt to keep the consumer advised regarding the value of registered seed.

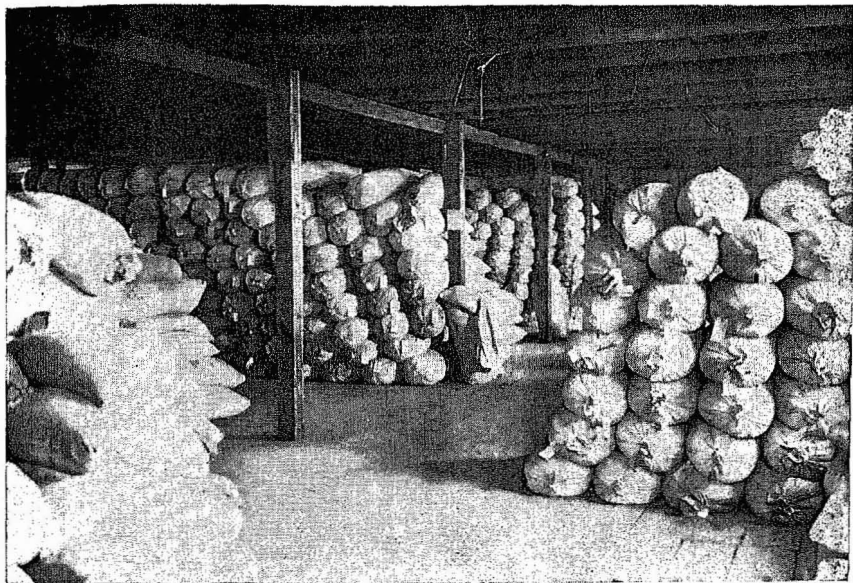


Fig. 8—Montana registered alfalfa seed cleaned and tagged ready for shipment to the ultimate consumer. Look for the tag of the Montana Seed Growers association on the bag.