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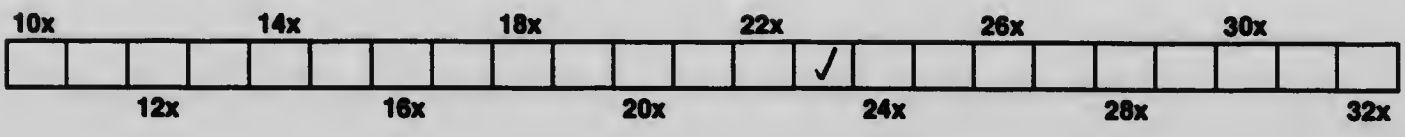

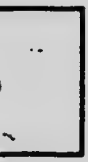

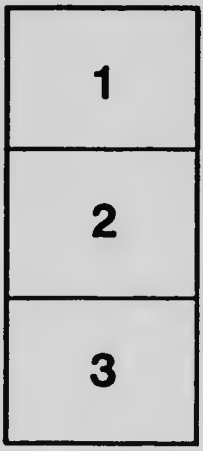


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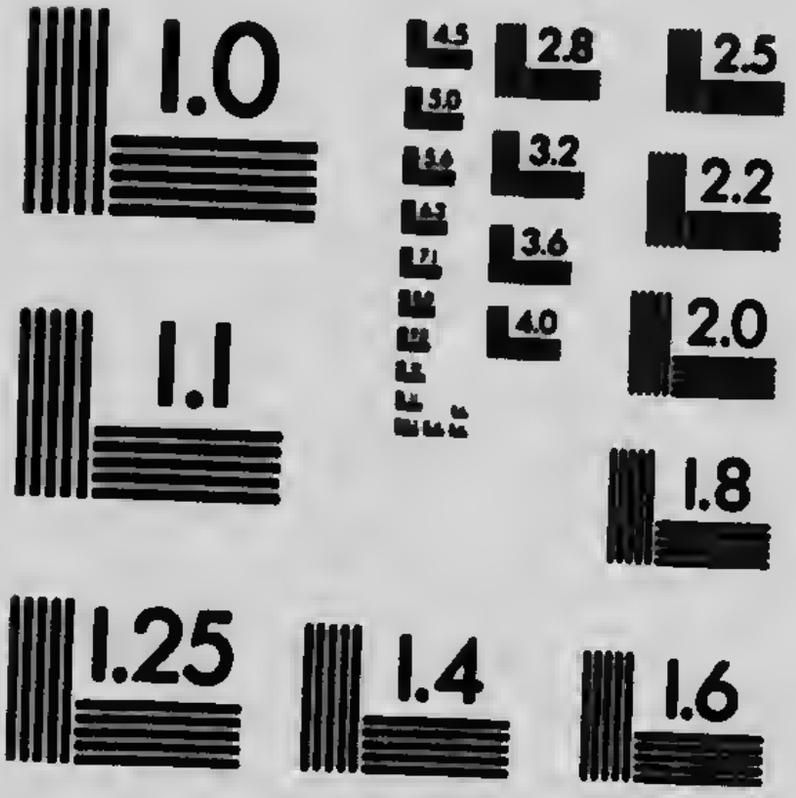


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MANITOBA DEPARTMENT OF AGRICULTURE
Winnipeg, Manitoba

# Alfalfa Growing in Manitoba



Field of Manitoba Alfalfa

Part 1

General Information Regarding Alfalfa—By T. J. Harrison, B.S.A., Professor of Field Husbandry, Manitoba Agricultural College, Winnipeg

Part 2

Inoculation of Alfalfa and other Legume Seed with Nitro-Culture—By C. H. Lee, M.A., Professor of Bacteriology, Manitoba Agricultural College, Winnipeg

By authority of Hon. V. Winkler, Minister of Agriculture and Immigration

PART 1

# General Information Regarding Alfalfa

T. J. HARRISON, B.S.A., Professor of Field Husbandry, Manitoba Agricultural College

## Special Value of Alfalfa

Alfalfa not only serves to balance the ration for the farm live stock, but it also provides a means whereby nitrogen can be secured cheaply from the soil air. Alfalfa has a deep rooting system, and it may thus take the place of a sub-soiler in opening up the lower soil layers. It may be observed, as well, that such a crop leaves considerable organic residue in the soil. The latter material is important in that it increases the moisture holding capacity of the soil, and in the process of decomposition assists in liberating plant food for the growing crop. With the introduction of alfalfa—and this will apply equally well to the clovers—better systems of crop rotations can be organized, and the farm income can be made somewhat more regular. Moreover, the production of forage crops is directly related to a better seasonal distribution of farm labor.

## Previous Cropping

In selecting a field for alfalfa some attention should be given to the crop which has been grown the preceding season. To get the best results, well defined plans should be made one or two years prior to seeding. Summerfallow which has been well cultivated and is reasonably free from noxious weeds gives the grower an excellent starting point. This or any hoed crop suggests at least three advantages. In the first place, the cultivation given will eradicate many of the weeds which have come into the field; secondly, moisture will be stored for the young alfalfa; and, thirdly, the field will be left in an excellent physical condition.

## Character of the Soil

Alfalfa requires a deep mellow soil if maximum crops are to be .ested. The alluvial river bottom lands of this continent provide .n ideal home for this deep-rooted legume; large yields are invariably obtained on these areas. The crop can be grown on all types of soil, from the heavy clays to the coarser grained sandy soils; and it may even be cultivated on gravelly soil, provided the subsoil furnishes a suitable reservoir for moisture, thus affording a complete and continuous supply for the crop. While a loose open soil is not the best type for alfalfa, the other extreme, an impervious subsoil, is sometimes a controlling factor, and root development may be interfered with materially. A friable soil makes the best home for alfalfa.

## The Seed Bed

A firm, well prepared seed bed will assist materially in getting a catch the first season. Where the seed is to be sown on summerfallow, corn or root land, the drag harrow (and if very compact the disc) can be used to work up a mulch one and one-half to two inches

## How To Get Nitro Culture

Nitro-culture is put up by the Bacteriological Department of the Manitoba Agricultural College in bottles, each containing enough to inoculate a bushel of seed. These are sent out by mail, and a charge of 25c. is made for each bottle to cover cost of preparation and mailing. Send cash with order, and address: Bacteriological Department, Manitoba Agricultural College, Winnipeg, Manitoba.

## DIRECTIONS FOR INOCULATION

(1) Do not open the bottle of culture or expose it for any length of time to the light until you are ready to inoculate the seed, and do not inoculate more seed at one time than can be sown in a day.

(2) The whole contents of the bottle may be used on a small amount of seed without doing any harm.

(3) To treat the seed, put into a clean dish one pint of sweet skimmed milk and four tablespoons of sugar. Heat the milk to the boiling point, stirring occasionally, and boil it for a minute or two. Let it stand until the milk is cold. If less than a bushel of seed is to be treated, proportionately less milk and sugar may be used.

(4) When the milk is cold, pour a little into the bottle of culture, replace the cork and shake the bottle vigorously. Pour this portion of the milk from the bottle back into the dish. Repeat this at least six times. The jelly in the bottle will not dissolve, but should be broken up with a clean stick and mixed with the milk. The bacteria are on the surface of the jelly, hence it is not necessary that the latter be dissolved.

(5) Heap the seed on a clean floor or table, pour the mixture over it and mix thoroughly with the hands or shovel until each seed is wet. It is important that this mixing be done very thoroughly, so that each seed will be inoculated.

(6) Spread the seed in a thin layer, out of sunlight, handling over at intervals until it is dry enough to sow. This will not usually take over half an hour.

(7) The seed should be sown immediately after treatment.

## VARIETIES OF NITRO-CULTURE

Each legume requires a strain of bacteria suitable for that legume. Nitro-Culture for the following will be available for distribution:—Alfalfa, Alsike, Red Clover, White Clover, Sweet Clover, Sweet Peas, Beans, Garden Peas, Field Peas.

Alfalfa, Eight Weeks After Seeding, on Agricultural College Farm

deep in the spring. The work should start as early as possible and continue at frequent intervals until the alfalfa is sown. This will kill the weeds, conserve the moisture, and prepare an ideal seed bed.

### Varieties of Alfalfa

Within the past decade considerable interest has been taken in the development of varieties of alfalfa adapted to northern climatic conditions. Of these, seed of only three varieties, Grimm, Baltic and Turkestan, has been produced in commercial quantities. Grimm and Baltic are generally conceded to be the two hardiest of the three and are the only ones that should be grown if seed can be secured. The supply of seed, however, is limited; consequently the price per pound is very much higher than that of Turkestan. The latter is a commercial term used for alfalfa seed of somewhat varied strains, these different strains having originally been imported from Turkestan; consequently the plants from Turkestan seed may prove either hardy or tender. In most cases it has given satisfactory results in Southern Manitoba.

Noxious weed seeds are sometimes brought in along with alfalfa seed, hence in buying, the purchaser should take only No. 1 Seed sold under the regulations of the Seed Control Act.

### Rate of Seeding

The quantity of seed sown per acre will depend on its viability and the annual precipitation. For most districts in Manitoba seed of high vitality should be sown about twelve pounds per acre. In the drier districts eight to ten pounds will be sufficient.

### Time of Seeding

In general, it may be stated that alfalfa seed can be sown safely between the dates May 15th and June 15th. If sown earlier than the middle of May, the young plants may be damaged by freezing. Summer showers frequently come early in June, and to get the benefit of these the seeding should be done the latter part of May, or early in June.

### Method of Seeding

The best results are obtained when the seed is sown with the grain drill, the latter being set to run about one inch deep. This permits covering with soil at a uniform depth, and the seed is brought directly in contact with soil moisture. In sowing the seed, it should be mixed with twice the quantity of coarsely cracked wheat or barley, from which the fine flour has been blown with the fanning mill. If the seeder is set to sow about two pecks of wheat, it will put on approximately twelve pounds of alfalfa seed.

### Using a Nurse Crop

It is customary, in sowing clover seed, to put the seed in along with oats or barley, and this practice has led some farmers to believe that alfalfa can be sown in the same way. The nurse crop not only shades the young alfalfa plants and prevents them from making their most rapid growth, but it also consumes moisture and plant food, thereby reducing the supply available for the young and tender plants. For this reason it has proven to be much more satisfactory to sow the alfalfa without a nurse crop. In districts where the soil has a ten-

dency to drift, a bushel of oats per acre may be sown in order to overcome this difficulty; but the oats should be clipped with the mower when the alfalfa has obtained a foothold.

### Treatment First Year

The field should be clipped with a mower when the alfalfa and weeds are about six inches high, and the clippings may remain on the field to form a mulch. This will hold the weeds in check. For the alfalfa it is best to have the cutting bar of the mower set so that it will not injure the crown of the plant. It is advisable to clip two or three times during the summer. The last clipping should not be later than August 15th, because considerable growth should remain on the field as a winter protection.

### Pasture

It is highly desirable to keep stock from grazing on alfalfa the first year. In fact, alfalfa should not be pastured excessively at any time, and no grazing should be contemplated until the crop is thoroughly established and the plant roots well developed. The field should be at its best the third or fourth year after seeding. Pasturing close the first year will have a tendency to injure the alfalfa crowns, and where the stock are allowed to run at will, the surface of the field may be roughened by tramping when the soil is wet.

### Curing Alfalfa Hay

There will be no hay the first year. The second year the alfalfa will be ready for cutting, and two crops will be available during the growing season. To get the best quality of hay, the cutting must be done when the plants start to blossom, which will be the latter part of June the first time, and early in August for the second time. It may be well to repeat that the crop should not be cut late in the season. In curing the hay, care should be taken to save as many of the leaves as possible. Alfalfa should not remain exposed in the swath for any length of time. When partially cured it should be placed in small cocks, remaining in this position until cured thoroughly, at which time it can be placed in the stack or mow.

### Seed Production

Where seed is to be produced, a hardy variety, such as Grimm, should be used. The seed should be sown in drills thirty inches apart and intertilled to control the weeds. Other than this it should receive the same [illegible] as for fodder the first season. The second year seed can be [illegible]ed. After the pods are nearly all ripe the crop can be cut with a mower having two or three men following with the forks rolling the alfalfa into bundles and placing them out of the way of the horses the next round. When it has become thoroughly dry it is ready to thresh. This can be done to best advantage with a clover huller. Where one of these cannot be obtained, the alfalfa can be put through the grain separator, some of the seeds will be threshed, but most of the pods will be unbroken. Some of the best farmers report success in running these pods through the feed grinder with the plates not set too close. After the pods are broken, the seed can be cleaned through a fanning mill.

PART 2

# Inoculation of Alfalfa and Other Legume Seed with Nitro-Culture

C. H. LEE, M.A., Professor of Bacteriology, Manitoba Agricultural College

## Legumes

Legumes include all plants with a pod like a pea or bean. The following may be found on Western farms:—Alfalfa, Sweet Clover, Red Clover, White Clover, Alsike, Beans, Sweet Peas, Garden and Field Peas.

### Legume Bacteria

On the roots of most thrifty legumes there may be found nodules which contain bacteria. These take nitrogen from the air in the soil and feed it to the plant. Hence, plants with nodules grow better than those that have none, and since they take their nitrogen from the air they are said to be "easy on the soil." In fact, they tend to enrich the soil by leaving some of this nitrogen in it.

A Well Inoculated Root

### What Nitro-Culture Is

Nitro-culture consists of bacteria growing on the surface of a jelly like culture medium in a bottle. These bacteria are originally taken from the legume nodules and are then grown on the jelly much the same as yeast is grown for baking. In fact, the inoculation of legume seed with nitro-culture is much the same as inoculating bread dough with yeast.

### Necessity for Inoculation

Western soils as a rule do not have Alfalfa or Clover Bacteria in them; hence it is a good practice to inoculate the seed when these are first grown on a certain piece of land.

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