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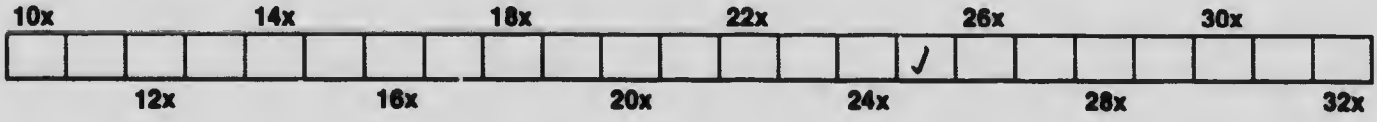

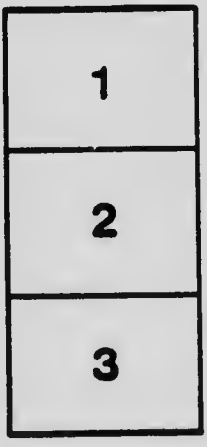

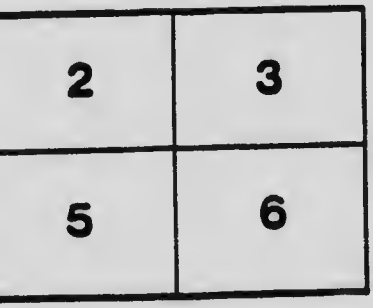

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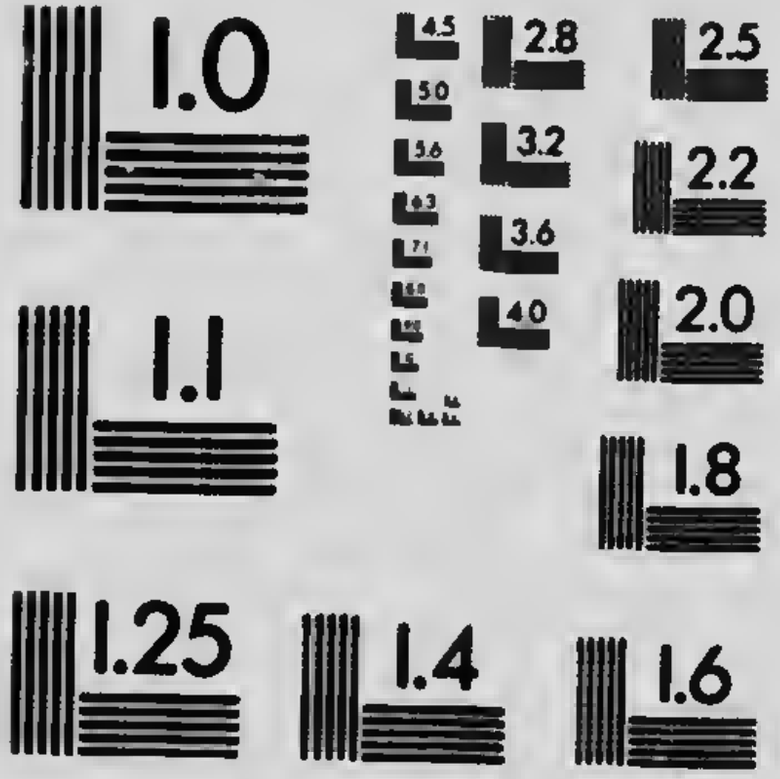

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ALFALFA GROWING IN EASTERN CANADA

BY

M. O. MALTE, Ph.D.

Preparation of the Land, Seed and Seeding, Treatment of Crop the First Year.

Introduction.

Long before the Christian era the merits of alfalfa were recognized by those people in the Old World who had to rely for their prosperity or even their existence on success in animal husbandry. In Central and Southern Asia, the home of alfalfa, no other plant was more highly esteemed as a forage plant. That this is true is indicated by its name, "Alfalfa" being derived from the Arabic "Alfalfacah," which means "The Best Kind of Fodder."

Alfalfa has been cultivated for at least two thousand five hundred years, always holding its place as one of the best of fodder plants ever known.

In Canada it has been grown for at least fifty years, but it is only of late that its superior qualities have been fully realized and that, as a consequence, its growing has become more general.

Feeding Value.

All kinds of farm animals like alfalfa and thrive upon it. It furnishes an exceedingly nutritious, wholesome and much relished food, be it given to the animals in the green state or as hay.

For Dairy Cows alfalfa is particularly valuable. For milk production, alfalfa pasture is worth more than any pasture composed of clover and grasses. As a soiling crop it cannot be surpassed, and well cured alfalfa hay has no equal as a dry fodder.

For Sheep, Lambs and Hogs alfalfa is also exceedingly valuable, its fattening and flesh producing qualities being universally recognized.

Horses are very fond of it and thrive remarkably well on it.

Fertilizing Value.

Like all other legumes, including clovers, peas and vetches, alfalfa has the property of enriching the soil with nitrogen gained from the air. It also adds large quantities of humus to the soil through dead leaves and decaying roots. Thus alfalfa not only improves the mechanical condition of the soil, but also increases its fertility.

SOILS.

Alfalfa is a perennial plant with a vigorous root system which penetrates the soil to a great depth in search of food. Thus a fair proportion of the food needed for the growth of the plant is taken from the subsoil.

To ensure the best results, i.e., to ensure vigorous growth and heavy crops for many consecutive years, alfalfa should therefore be grown on land with a deep, rich, open and porous subsoil, easily penetrable to the roots to a depth of at least two or three feet.

Hardpan or impenetrable clay near the surface will prevent the roots from developing properly and, as a result, seriously check the growth and yielding capacity of the crop.

Water standing near the surface has the same effect. As a matter of fact, alfalfa is very sensitive to an excess of water in the ground. It does exceedingly well in a

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DOMINION EXPERIMENTAL FARMS.

J. H. GRISDALE, B.Agr., Director.

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moderately moist and at the same time well aerated soil but is unable to thrive in water clogged soil where free circulation of the air has been made impossible or difficult.

It should therefore be sown only on well drained land where excessive water can be promptly and rapidly carried off.

On poorly drained land or low land subject to be flooded for even a short time, alfalfa is likely to be a complete failure.

Sour soil also should be avoided. It is quite unsuitable to alfalfa, unless the acidity can be neutralized by a liberal application of lime.

As an alfalfa field, when once well established, continues to produce crops for many consecutive years, it follows that alfalfa has no place in a short rotation. It is therefore advisable to choose, for alfalfa, a convenient sized field which does not form part of the regular farm rotation, preferably close to the farm buildings.

Soil Preparation.

To insure a good stand the land selected for alfalfa should be:—

1. Stored with an abundance of plant food.
2. Free from weeds.
3. In excellent physical condition or tilth.

These conditions can be secured in different ways depending on the nature of the previous crop.

If the land selected for alfalfa is in clover sod or meadow it should be ploughed shallow and rolled immediately after the hay crop is harvested. A short time later it should be thoroughly disced and harrowed, and then cultivated at frequent intervals to keep down all growth. The cultivating should be continued until late autumn. In October, the land should be ploughed again with a subsoiler attached to the plough, or ploughed with two ploughs, one without a mould board following the track of the other and stirring the subsoil as deeply as possible.

Instead of the land being ploughed and subsoiled as advised above, it may be cultivated deeply lengthwise, crosswise and angling with a strong stiff-toothed cultivator, to be followed by a double mould-board plough, leaving the whole field in ridges about 7 inches high and 22 inches apart.

In the spring following, the ridges should be split with the double mould-board plough, then thoroughly harrowed and rolled before sowing, making a perfectly fine and at the same time firm seed bed.

If the land selected for alfalfa is in hoed crop, it would be advisable to plough, when the crop has been harvested, as deep as the humus and the plant food in the soil will allow, or, still better, to plough shallow and subsoil as deeply as possible, leaving the furrows well set up to the winter frosts.

In spring, when the land is in fit condition, it should be harrowed at intervals and thus kept free from weeds. After the last harrowing, i.e., just before sowing, a heavy land roller should be run over the land to insure a firm seed bed.

Should any growth of weeds appear at the seeding time it would be advisable to plough the land shallow, roll and harrow just before seeding.

Inoculation.

For a healthy, vigorous and lasting growth of alfalfa, it is necessary that a certain kind of bacteria is plentiful in the soil. The bacteria in question live in a kind of association with the alfalfa plant and act as collectors of nitrogen, which in some way, not yet fully understood, is utilized by the alfalfa plant.

Wherever there is a good stand of alfalfa, there is also an abundance of the alfalfa bacteria in the soil.

In soil which has not grown alfalfa before, the bacteria may either be wholly absent or present in too small a number to insure a vigorous growth of alfalfa from the start. In this case the bacteria should be introduced into the soil artificially.

This can be done in the following two ways:—

1. Soil from an old alfalfa field is scattered on the land, w[illegible] the seed bed is prepared, and harrowed in. The soil used should be scraped fr[illegible] surface foot of an old alfalfa field, and still scattered over the land, prepared for alfalfa, at a rate of 150 to 300 pound to the acre.

It must not be allowed to dry up in the sun, before being scattered and harrowed in, as then its inoculating power may be destroyed.

Should old alfalfa soil not be cheaply available, then soil from a sweet clover field, if accessible, can be used with the same effect.

2. When soil inoculation, as described above, is impracticable the bacteria can be incorporated with the soil through the medium of the alfalfa seed sown. In this case the seed is treated, immediately before sowing, by an artificial culture, called nitro-culture.

This can be obtained free, with directions as to its use, upon application to the Division of Botany, Central Experimental Farm, Ottawa. When asking to be supplied with nitro-culture the applicant should state how many pounds of seed are to be inoculated.

SEED AND SEEDING.

QUALITY OF SEED AND VARIETY.

For the best results with alfalfa, the quality of the seed is of the greatest importance.

Not only is it necessary to use well fil'ed plump seed of strong vitality and free from impurities, but still more so to use seed of a variety adapted to the Canadian climate.

It is **absolutely necessary to use seed of a variety able to withstand the winter without being partly or wholly killed.**

The safest varieties, available commercially at present, are **Grimm's alfalfa** and **Ontario Variegated alfalfa.** Still better is homegrown seed, i.e., seed produced in the home district, because such seed has been produced by plants which, by reason of their very existence, have proven themselves able to survive and thrive.

WITH OR WITHOUT A NURSE CROP.

Alfalfa can be sown with a nurse crop or without. Whether it should be sown with a nurse crop or not depends largely on the state of fertility of the land and the climatic conditions. As a rule a nurse crop should be used only when the soil is rich in plant food and humus, and the climatic conditions known to be in favour of alfalfa growing [illegible] districts or on soil where some difficulty in starting alfalfa has been experie[illegible] [illegible]se crop should be used.

I[illegible] [illegible]ward Island; Nova Scotia, New Brunswick, Quebec and Eastern Ontari[illegible] [illegible] advisable to sow without a nurse crop on land of average fertility.

Time of Seeding.

If sown with a nurse crop the seed should be sown in the spring with not more than one bushel of early maturing barley or spring wheat.

If no nurse crop is used, the seed can be sown any time from the spring to the beginning of August, depending upon conditions. Sowing too early in the spring, when the ground is still wet and cold, is not advisable.

Methods of Seeding.

When sown with a nurse crop the seed is sown from the grass seed attachment of the grain drill.

When sown without a nurse crop, the seed can be sown broadcast either by hand or from the grass seed attachment to the grain drill. It can also be sown in drills from the grain tubes of the ordinary seeder. In the latter case the seed should be

mixed with some coarser material to prevent too thick seeding. For this purpose ground wheat crushed as coarsely as possible is generally used. The alfalfa seed is mixed with the crushed wheat and the drill set to put on the amount wanted. For instance, 20 pounds of alfalfa mixed with 40 pounds of crushed wheat, and the drill sowing one bushel per acre will mean 20 pounds of alfalfa sown to the acre.

Whatever method used, the ground should be harrowed and rolled immediately after sowing and then the surface of the rolling lightly broken with a brush harrow, a weeder or a tilting harrow.

If the land is deficient in plant food, alfalfa may be sown in rows about eighteen inches apart. By this method, however, a crop is obtained which, though it may be satisfactory as to quantity, is somewhat inferior in quality to the crop obtained when the seed is sown broadcast or in drills from the seeder.

Depth of Seeding.

How deeply the seed should be covered, depends on the soil conditions. On average soils the depth should be about one inch or a little less. On light sandy soils with a dry surface, the seed should be covered about an inch and a half.

Quantity of Seed to be Sown.

When sown broadcast or in drills with the ordinary seeder, about 20 pounds of good seed of strong vitality should be used to the acre. If sown in rows eighteen inches apart, a third of this quantity will be ample.

TREATMENT DURING FIRST YEAR.

Young alfalfa plants are very tender and must be given every chance to establish themselves firmly. During the first season they should be treated in such a way as to be able to enter the winter in the best condition possible.

With Nurse Crop.

In the case of the alfalfa being sown with a nurse crop, careful watch must be kept to see that the young alfalfa plants are not being smothered by lodging grain. When harvesting the nurse crop the binder should be set to cut 5 or 6 inches from the ground. Shocks should not be allowed to stand for more than two days on the same spot, as they would smother out the young alfalfa. Should weeds appear after the nurse crop has been harvested or the alfalfa grow tall and rank it would be advisable to clip the field as high as the mower will allow, though not later than the middle of September.

Without Nurse Crop.

In case of the alfalfa being sown without a nurse crop, broadcast or in drills 7 inches apart or thereabout, it is necessary to mow the field at frequent intervals throughout the season. The plants should not be allowed to go to bloom the first season but the field should be clipped as soon as the plants reach a height of from 8 to 12 inches. The clippings should be left on the field as a mulch. The last clipping should be timed so as to allow the plants to reach a height of about 8 or 10 inches at the end of the growing season. This growth should be left uncut for winter protection.

If these directions are followed, the weeds will be kept down and the alfalfa itself will enter the winter in good condition.

If the alfalfa is sown in rows 18 inches apart or more, it is necessary to cultivate at intervals, between the rows, especially early in the season. Otherwise the growth should be encouraged by frequent clippings as advised above.

Under no circumstances should live stock of any kind be allowed to graze upon an alfalfa field the first season.

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