

Where There Are Legumes There Is Life and That More Abundantly, and Our Farmers Must Raise More Legumes

CLOVER FOR WESTERN OREGON, FROM THE AGRICULTURAL COLLEGE VIEW POINT

There Is No Leguminous Crop Which Gives as Good Return Per Acre and at Same Time Contributes as Much to the Upbuilding of the Soil in Western Oregon

(The following is Circular 77 of the Oregon Agricultural College Extension Service, on "Clover for Western Oregon," the author being Geo. R. Hyslop, professor of farm crops.)

There is no leguminous crop which gives as good a return per acre in the form of hay or seed and which at the same time contributes so much to the upbuilding of the soil of Western Oregon as does red clover or alsike clover. On any soil that is reasonably deep, fairly mellow, and well drained, the red clover is quite likely to be successful. It does best on the soils that are free from acid, but it is also a very successful crop on many soils that are rather sour. For the low, wet, heavy soils, such as the white lands and similar heavy, poorly drained types, the alsike clover is considerably better than the red.

The difficulty which most farmers experience with the crop is in getting it started. There are very few farms in Western Oregon that do not have soil that is adapted to one or the other of these types of clover, but in many cases it is rather hard to get a stand. Clover responds well to liberal use of barnyard manure. This is especially important on land in poor physical condition, as it makes successful starting of the crop more easy. Where barnyard manure is not available, the plowing in of green manure gets good results. If the fertility of the soil is poor, an application of 25 to 30 pounds per acre of land plaster early in March, either before or after seeding, is a great help. In sections of the state where clover has not been previously grown, it will be well to secure culture from the Department of Bacteriology of the Oregon Agricultural College and inoculate the clover seed.

The methods for seeding red clover and alsike clover are identical, except that different quantities of seed are used. Two pounds of red clover seed is usually sown per acre, and eight pounds of the alsike seed is ordinarily used. The following methods have been repeatedly tried out with success:

First: On well drained hill lands that are not heated by freezing and thawing, clover may be seeded at the

same time that fall wheat, oats, or barley is planted. The method used is to broadcast the seed ahead of the grain drill either by hand or from the small seed box attachment to the drill. The furrow openers of the drill serve to cover the seed. In other cases, it is simply broadcasted after the drilling is done and the fall rains are depended upon to beat it into the soil. This method is often unsuccessful because of periods of freezing and thawing which heave the small clover plants entirely out of the soil. However, there is always an opportunity to reseed in the spring.

Second: Clover is frequently seeded on fall wheat, oats, barley, or on vetch and, from the middle to the latter part of February, by simply broadcasting the seed over the grain or vetch field, whenever the soil is in the proper condition. In case the surface is lightly frozen, the seed may be simply broadcasted on the frozen land, and the thawing will serve to get it sufficiently covered for germination. If the land is dry enough for cultivation, the clover seed should be broadcasted and harrowed in lightly. This will not only cover the seed but will be beneficial to the cereal crop. In many cases, however, it is inadvisable to harrow the vetch. In case the spring growth of the cereal or vetch begins, it is necessary to get the clover seeded as promptly as possible, even though the field be somewhat soft and no harrowing is possible. In such case, the rain usually beats in enough of the seed to secure a stand. The seeding must take place by the last week in February or very early in March, before the spring growth begins, lest the seed be smothered out.

Third: Clover is frequently seeded with various types of early spring grain, in March or April. Usually spring oats or spring wheat is seeded at this time, and the clover is broadcasted ahead of the drill. This method is very satisfactory with both wheat and oats if the seeding takes

place early. In case the seeding is delayed until a somewhat later period, it is better to use method No. 4.

Fourth: This method consists of sowing with barley, usually some time in April, in the same manner as is done with oats under method No. 3. However, if your soil is likely to dry out and it is getting somewhat late in the season, it is best to use beardless barley, as this offers less competition to the clover.

Fifth: This method is adapted to a farm where a considerable amount of sheep or hog pasture is needed. It consists of broadcasting about five pounds of rape together with the clover seed over the field about the middle to the latter part of April and harrowing it in lightly. In from six to eight weeks the rape is big enough to be pastured off, and if the land is dry enough, sheep or hogs can be turned on and they will keep the rape pastured down but, unless excessively close pasturing is allowed, will do no damage to the clover plants. Hogs, of course, should be fenced, to prevent rooting.

Sixth: In case the land is in very poor physical condition or is badly infested with weeds, it may be necessary to sow the clover alone. Following out this method, the land should be manured if possible, plowed early in the spring, and kept well cultivated in order to maintain a good mulch and to keep the weeds down until seeding time, which is about April 20 to May 10. The seed is drilled in about one inch if suitable machinery is available for sowing at this depth. Great care must be taken to avoid sowing too deeply. In case the drill is not used, it is best to broadcast the seed and harrow it in lightly. These methods are all successfully used in getting stands of red clover under Western Oregon conditions, and of them, I prefer the second, fourth and sixth methods for general farm conditions, but in case of need for livestock pasture, the fifth is a good method.

sponds to inoculation as does alfalfa.

Seed of sweet clover is often hard and germinates poorly. Three types are available: (1) Scarified or scratched, (2) hulled, and (3) unhulled, and usually germinate in the order mentioned. A germination and purity test should always be made at the seed testing laboratory.

The sweet clover should be planted at 15 pounds per acre, if a full stand is desired, especially if it is to be used for pasturing purposes. If the germination fails much below 80 or 85 per cent, it is necessary to increase the amount of seed sown on this land, five to eight pounds per acre are broadcasted in February, March or April. On good land seeding usually takes place in April or very early in May and may be done by either broadcasting or drilling on a good seed bed. Under ordinary conditions to which sweet clover is adapted, broadcasting is done. Where possible, it should be harrowed in. Sweet clover is best as a pasture plant and must be kept pastured back closely, otherwise it will get too coarse and woody. It may be pastured in the latter part of the first season and the early part of the second season. As a hay plant, it is less valuable owing to (1) its coarseness of stalk, (2) its succulence and the difficulty of curing it, and (3) the ease with which its leaves are lost. For hay it is cut before it begins to branch and come into bloom. It should be cut high so a second growth will take place.

Sweet clover is used as a summer soiling crop and should be cut high. When somewhat coarse, it is cut into the silo and is said to make rather good sheep and cattle feed.

For some time the seed industry especially for the sweet clover has been a good one, and combines well with pasturing. The pasturing may be carried on until the crop begins to develop its stems and branches and then the seed crop may be allowed to develop. It is usually cut with a self-rake reaper and is thrashed with an ordinary clover huller, although in many cases, where such a machine is not available, the ordinary thrasher is used.

Some have done well by stripping seed of wild plants along roadsides and ditches by hand or with comb-like strippers.

Sweet clover sells from 10 to 15 cents per pound up to, in some cases, as high as 20 or 25 cents.

For seed production the stand should be thin. It yields from 500 to 1000 pounds of seed per acre.

To kill sweet clover cut when just past full bloom. Use of cultivated crops is also good. If sweet clover goes to seed on the land, usually it keeps the place pretty well re-seeded and in the presence of a large quantity of hard seed which are plowed under there may be some sweet clover developing year after year as the soil is turned up.

There is a good market for the seed of this plant, but the final or ultimate use to which the sweet clover will be put after the boom and experimental period is over will in all probability be for pasturing; on many lands too thin or too dry to produce other crops; also it will be valuable for green manuring purposes on certain fields on which it is difficult to start alfalfa or some other of the better legumes. Sweet clover is an excellent forage plant on soils too alkaline for alfalfa and may be used for hay if a better plant cannot be grown.

Sweet clover offers most promise

THE NODULES IN THE ROOTLETS OF THE LEGUMES FURNISH THE NITROGEN

And the Nitrogen Gives Life to the Plants Which Follow in Those Fields—A Number of Leguminous Plants Do Well in This District, Especially the Vetches, the Clovers, and the Alfalfas

By JESSE HUBER.

A number of leguminous plants do well in Western Oregon. Of these, experience has determined that the vetches, clovers and alfalfas serve about all purposes to which the legumes may be put.

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Vetch, sowed with oats or wheat, early in the fall, may be cut as green feed for livestock during April and May the following spring. When it shall have reached a sufficient stage of maturity the combination may be placed into the silo or cured for hay.

Vetch and Oats Combined.

Vetch and oats, sown as a mixture, can also be harvested as a grain crop. By cutting the vetch and oats when the vetch pods have turned brown not much loss of the seed will result. If it is desired to separate the vetch from the oats this can be readily done by running the grain through a fanning mill. Good vetch seed is sometimes in strong demand for shipment to points in California and the Gulf States.

Vetch, if cut early, will send up a good second growth furnishing considerable pasture during the summer. It is sometimes said that vetch may be pastured during the early stages of its growth. I have never found this practice satisfactory.

Red Clover a Good Crop.

Of the several kinds of clover, the red clover is the variety most widely grown. Where red clover can be successfully produced it is a most valuable farm crop. This poplar legume, in some respects, is the equal of alfalfa in the various uses to which it may be put.

Clover, as a soil enricher, has long been recognized. The root system is large, amounting in bulk to almost as much as the crop of hay cut from the meadow. This mass of roots, when decayed, will supply much needed humus to the soil.

The roots of clover also penetrate deep into the soil, tending to disintegrate the soil particles, leaving the ground loamy and in good tilth after having been plowed.

Clover bears nodules on the rootlets. These small white globules contain nitrogen which has been mysteriously extracted by the plant from the inexhaustible supply in the air. When the plant dies the nitrogen is liberated into the soil where it is utilized by the succeeding crops in increasing plant growth.

It is not uncommon for the productivity of the soil to be doubled by the growth of a single stand of clover. Some of the most successful wheat, corn and potato growers make use of clover in their crop rotation, following alfalfa.

On alkali and shallow irrigated soils of eastern Oregon, on some of the western Oregon dry hills and on dry gravelly soils, it may become of value when thinly seeded as a dry land crop.

the stock should be turned off and the plant allowed to come to head.

The plant may be cut for seed when the heads have died. It is not always easy to get the cut clover dry and brittle enough so the seed will hull out freely. Dew and rains interfere with the proper handling of the crop in Western Oregon and Washington.

Clover can be grown successfully on a wide range of soils. It, however, needs good drainage and fairly rich soil. Acid soils are not well suited to grow large yields of clover. The excessive acidity should be neutralized by the use of lime before the land is seeded to clover.

If the soil remains wet during the winter alsike clover will bring better returns than red clover.

Many experiments with alfalfa have been carried out in order to establish alfalfa in the region west of the Cascades. The experiments have proven encouraging only under the most favorable conditions.

Generally, most of the soils in these regions are too wet and too much charged with acidity to afford a congenial setting for the exacting alfalfa plant. Where the soil is deep, well drained and reasonably fertile, good stands of alfalfa may be grown.

Alfalfa and clover have several persistent enemies which prove very troublesome. Perhaps none is more so than the well-known and industrious pocket gopher.

These busy little rodents seem to have a special liking for clover and alfalfa roots. They not only cut off the roots, causing the plants to die, but in digging their runways, they

(Continued on page 4.)

ALFALFA IN WESTERN OREGON DOES WELL ON SOME SOILS

In the Willamette Valley It Is Rather Successful in the Warm, Well Drained Sandy and Gravelly Loams of the Willamette River Bottoms—Clover Is Better on Other Soils

(The following is the part of Circular 59 of the Oregon Agricultural College on "Alfalfa in Western Oregon," the author of the circular being G. R. Hyslop, professor of farm crops, and the date being July, 1917.)

Alfalfa in Western Oregon.

Alfalfa is a success on the deep, well drained and sweet soils prevailing in many of the valleys of Jackson, Josephine and Douglas counties. It is rather successful on the warm, well drained sandy and gravelly loams of the Willamette valley river bottoms. On the average medium to heavy soils of the Willamette valley, it is not as successful as clover. Following are reasons:

1. Alfalfa is frequently injured during the winter. It seems to be only semi-dormant and during the mild wet season is often attacked by disease.
2. Many Willamette valley soils are too wet for alfalfa.
3. Most Willamette valley soils are sour and limestone for correcting acidity is too expensive for economical application.
4. It is established with greater difficulty than clover on average soils.
5. We frequently have bad weather when the first crop is ready in May or early June for hay.
6. Grasses and weeds grow during the winter while the crop is dormant.

Alfalfa is more easily started on the mellow soils well supplied with organic matter. It is often hard to start on soils in poor physical condition and low in humus.

Land for alfalfa should usually be manured with well rotted manure at 10 to 15 loads per acre. This should be disked in thoroughly and plowed under in the fall or very early in the spring. As soon as dry in the spring

It should be worked down and must be kept harrowed frequently to maintain a mulch and to kill young weeds up to the time of planting the alfalfa. On sour soils, 1000 to 2000 pounds of slaked lime or one to four tons per acre of ground limestone may be disked into the soil in March or April. This application is often beneficial, but is too expensive except for experimental purposes.

Martin's Acclimated and common alfalfa are usually best.

About April 15 to May 1 in Southern Oregon, and May 1 to 15 in the Willamette valley, 15 pounds per acre of good alfalfa seed should be drilled not over one inch deep or should be broadcasted on the field. If the surface is dry it should be rolled in with a corrugated roller or if moist it should be harrowed lightly to cover the seed.

No nurse crop should be used. Weeds often shade and smother the young alfalfa. Whenever this happens the plants are attacked by disease, the field should be clipped with the mower set about two inches high. This is not particularly good for the alfalfa but it is more injurious to the weeds and is necessary to prevent more serious loss.

Alfalfa should not be pastured heavily the first year. It should not produce seed in its first season. It is cut with least injury when at the hay stage.

Irrigation greatly increases the yields in Western Oregon. Sulphur has increased alfalfa yields on several Southern Oregon soils. Spring applications of land plaster (50 to 75 pounds per acre) in March or April are usually beneficial in the Willamette valley.

Alfalfa should be thoroughly cultivated with alfalfa cultivator, spring tooth harrow, or disk harrow each spring after it is well established.

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THE SPA

BOKHARA, BEST OF ALL THE CLOVERS FOR BEE PASTURE

A Clover That Looks Like Alfalfa, But Is Much More Hardy and Will Stand Far More Pasturing and Will Grow on Any Land

(Harley O. White, of Salem, Oregon, is one of the best posted men in this section on clovers and clover seeds. He is a member of the firm of D. A. White & Sons, feedmen and seedmen of Salem, and this firm buys the great bulk of the clover seed crop of this section. Mr. White was asked by the Salem slogan editor to furnish something for this edition on clover—with especial reference to the best clover for bee pasture. While Mr. White is a very busy man, especially at this season, he found time yesterday to comply with this request. This ought to result in the planting of Bokhara, Sweet, or Honey clover by every man in this section who has an orchard—first for bee pasture, and second, for the other benefits and uses that go with the raising of clover. The following is the article furnished by Mr. White: Bokhara, Sweet or Honey Clover (Melilotus Alba)

A few years ago this was classed as a weed, but it is now grown very extensively all over the United States and is found to be a very profitable crop, being used as a forage crop and as a bee feed.

It is undoubtedly the best of all clovers as a bee pasture, making a rapid growth and once seeded stays until plowed under.

It is a very valuable plant for soiling purposes. It is a legume and is now grown in this valley both as a pasture crop as well as for bees.

The leaf resembles alfalfa, but the plant is much more hardy and will stand far more pasturing and will grow on any land.

It seems to thrive especially on the wettest land, but does well on high dry land.

It is a plant of Asiatic origin, but has been grown in various parts of this country for many years.

The last few years has seen a very large demand from all parts of the United States for the seed.

At the present time, most of the seed is grown in Idaho and Utah and has proven a very profitable crop, as it is an abundant yielder and a sure crop.

Where it has not been grown before it is advisable to inoculate the seed before planting, as it is rather hard to start on land that has not grown clover.

SWEET CLOVER IS A GOOD CROP FOR PLANT AND SEED

And It Is the Crop Above All Others That Ought to Be and Must Be Raised to Furnish Bee Pasture for the Workers to Pollenize the Fruit Blossoms

(Following is Circular 78, on "Sweet Clover," by the Oregon Agricultural College Extension Service, the author being G. R. Hyslop, professor of farm crops.)

There are two types of sweet clover known as the "white blossom" and the "yellow blossom." The former is more extensively grown as it is biennial in its habit and is one of the better producers of food for livestock. The yellow blossomed sweet clover may be divided into two types—the large biennial type and the small annual type. The large biennial sweet clover is somewhat shorter than the white blossom type and is more spreading in its habit of growth, and is more likely to become a pest in the meadows. The small yellow is an annual type and is not as productive as the large white blossom type of sweet clover so that where the latter does well, so that where the latter does well, it is distinctly best. Sweet clover is

in many cases considered a weed and a pest. However, there are places in which it is distinctively valuable. It is more nutritious than is alfalfa or the other of the good leguminous plants and it is not as palatable. It contains an organic compound called Coumarin, which gives a distinctly strong flavor which is objectionable to most stock. It is often necessary to starve them to eating sweet clover. After they become accustomed to it, they like it and thrive upon it. Where peas, vetch, clover or alfalfa are successful, it is inadvisable to grow sweet clover, but on badly run-down soils where other legumes cannot be grown, oftentimes sweet clover will start more readily and may be utilized for feed or in getting the soil into condition to produce alfalfa or some other leguminous crop. If the soil is thin, rocky, scab land, or somewhat alkaline or otherwise poor, often sweet clover may be grown with success as a hay or pasture plant. It re-

THE ANIMALS THAT ARE FRIENDS OF THE FARMER

The Good Bacteria Which Take the Nitrogen Out of the Air and Put It in the Soil, Adding Fertility and Fruitfulness

(The following is from the Portland Oregonian of Monday of this week. It sets forth a principle of nitrogen-fixing bacteria that go with the legumes, that is well known to scientists, and ought to be better known and appreciated by every one.)

Insure greatest success with clover or other legumes on the farm, or with sweet peas in the flower garden, it is always advisable to inoculate the soil or the seed with nitrogen-fixing bacteria to insure not only a better crop of hay or flowers, but also to prevent the wearing out of the soil. These little animals clustering around the roots of the legumes enable the plants to capture the nitrogen from the air and place it in the soil, and as nitrogen is the greatest of all fertilizers the process automatically builds up the soil.

For the farmer several ways may be employed to inoculate his soil or seed. If he has never inoculated seed with the nitrogen-fixing bacteria it is advisable to secure the cultures from a seed store and treat the seed according to directions. If he has already grown a crop of the legumes and used the bacteria he may use some of the soil from the old field and scatter it over the new field at seeding time, being careful to harrow it in as soon as it is scattered.

Transfer Easily Made.

The old soil will be found to be alive with the little animals, who will soon find a new home alongside the roots of the new legumes. Such soil, experts say, should be taken from the old field two or three inches below the surface and should be transferred on a cloudy day, as sunlight or ex-

cessive heat will kill the bacteria.

A novel method is suggested by a grower in the middle west and explained in the current issue of The Dairy Farmer. He suggests taking soil from a field where inoculated legumes have been grown, taping the dirt from two or three inches below the surface and about a couple of handfuls for each bushel of seed to be planted. Dry the dirt in a cool place, keeping away from sunlight, and then sift. Prepare the seed in a thin solution of water and glue and then scatter the sifted dirt over the prepared seed. The dirt, containing thousands of the little bacteria, will adhere in fine particles to the seed, thus inoculating them. In a couple of hours or more the seed may be planted.

Sweet Peas Responsive.

For the sweet-pea grower who plans a row of these truly Oregon flowers for his yard it is advisable to secure a small bottle of the nitrogen-fixing bacteria from a seed store and use according to directions. Small bottles are on the market, especially for sweet peas, at a moderate price, adding but a few cents to the cost of the row of flowers, and yet if correctly used adding materially to the amount of bloom in the summer. Now is an excellent time to plant sweet peas for those who have not already done so.

In this climate the flowers can be planted almost any time during the fall and winter and with an average winter are generally found to do better with deep fall planting. If not planted in the fall, however, experts agree that it is best to wait until spring weather sets in and then plant in a rather shallow trench.

DATES OF SLOGANS IN DAILY STATESMAN

- (In Twice-a-Week Statesman Following Day)
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| Loganberries, Oct. 9. | Goats, March 11, 1920. |
| Prunes, Oct. 16. | Beans, March 18, 1920. |
| Dairying October 23. | Paved highways, March 25, 1920. |
| Flax, October 30. | Broccoli, April 1, 1920. |
| Walnuts, Nov. 6. | Silos, April 8. |
| Strawberries, Nov. 13. | Legumes, April 15. |
| Apples, November 27. | Asparagus, April 22. |
| Raspberries, December 4. | Hops, April 29. |
| Mint, December 11. | Poultry, May 6. |
| Great Cows, December 18. | Hogs, May 13, 1920. |
| Blackberries, December 25. | Paper Mill, May 20. |
| Cherries, January 1, 1920. | Land, May 27, 1920. |
| Pears, January 8, 1920. | National Advertising, June 3. |
| Gooseberries, January 15, 1920. | Sheep, June 10. |
| Corn, January 22, 1920. | Dehydration, June 17. |
| Celery, January 29, 1920. | Grape, June 24. |
| Spinach, February 5, 1920. | (Back copies of Salem Slogan editions of the Daily Oregon Statesman are on hand. They are for sale at 5c each, mailed to any address, if A.L.L. are taken; price for first 15 copies, 10c each.) |
| Onions, February 12, 1920. | |
| Potatoes, February 19, 1920. | |
| Bees, February 26, 1920. | |
| Mining, March 4, 1920. | |
- (It will interest some people to know that these back copies are selling fast—that, nearly every day, orders are received from near and distant points for the whole series. They will be sold out before the fifty-two Slogans are completed, without doubt.—Ed.)