

Government of the Province of Saskatchewan

DEPARTMENT OF AGRICULTURE

FIELD HUSBANDRY CIRCULAR NO. 20

SWEET CLOVER

BY JOHN BRACKEN,

Professor of Field Husbandry, University of Saskatchewan.

The so-called Sweet Clover (*Melilotus Alba*) is a tall growing, biennial plant, having coarse branching stems which bear white blossoms, and except when young, carry relatively few leaves. It is a "legume," but not a real clover. Nevertheless it has the power in common with clover, alfalfa, and other legumes, when inoculated with suitable bacteria, to gather nitrogen from the air.

During recent months, extravagant claims, and, from different sources, quite disparaging statements have been made concerning the value of Sweet Clover for forage purposes. The contrary views expressed have created in the public mind a state of confusion regarding its real worth as a cultivated crop. Under these circumstances we have been asked to summarize the results of our experience with this crop under Western Prairie conditions.

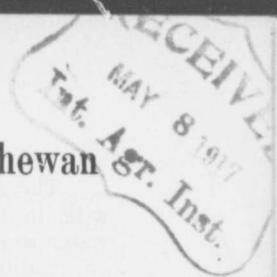
We have grown Sweet Clover here three different seasons. In 1912, broad-casted Sweet Clover, sown in June of the previous year was partly killed out, but the remaining plants grew as high as a man. In 1913 we had no Sweet Clover, but in 1914 when sown in rows 40 inches apart, at the rate of 4 pounds per acre, it yielded nearly thirteen tons, green weight, per acre, or considerably more than corn sown in rows the same distance apart. This year (1915) it produced about the same yield, which was also heavier than the average yield of corn, and much heavier than the yield of any of the hay crops we had under observation.

UNDESIRABLE QUALITIES

Sweet Clover has several very undesirable qualities. It is bitter, coarse, hard to cure, apt to become an impurity in alfalfa seed, and in waste places may become a weed.

It has been our experience that cattle, hogs and sheep will pasture it quite satisfactorily when it is young, but they do not like it when mature, nor can it be made into hay that is palatable after the blossoming stage. Most animals dislike the plant even in the young green condition at first, but they generally get to like it if kept from other feed for a short time. This experience is borne out by many practical farmers.

On account of its coarseness we have not been able to use Sweet Clover hay cut after the blossoming stage. It would seem that the crop must be either pastured while young, or cut for hay before blossoms develop. Its value for hay, even when cut early, has not yet been demonstrated in this country, but in portions of the Central Western States it is regularly used for hay.



The same difficulties experienced in curing alfalfa are to be met with in handling Sweet Clover. It carries a large percentage of water which makes it difficult to cure, and in addition the leaves fall off readily after drying. On account of these difficulties it would seem that at present the best use can be made of this crop by pasturing it. It is quite possible, however, that it may be found useful as a silage crop, although at present no data is available concerning its value for this purpose.

The seed resembles alfalfa so closely that if once mixed the two kinds cannot be satisfactorily separated. For this reason the use of Sweet Clover in possible alfalfa seed growing centres should not be encouraged until its value has been more positively determined.

In waste places where the land is not plowed every year Sweet Clover is sure to persist. It is our opinion that *Melilotus Alba*, the crop under discussion, will not become a weed on land that is plowed every year. The fact that it is a biennial, which does not seed the year it is sown, is sufficient guarantee that if prevented from seeding it cannot become a weed on land that is plowed every year. Under these conditions it cannot reproduce itself.

In this connection it should be pointed out that the yellow flowered Sweet Clover (*Melilotus Officinalis*) is much more likely to become a weed than the white flowered species (*Melilotus Alba*). The former should not be used for any purpose.

GOOD QUALITIES.

Among the redeeming qualities of Sweet Clover are, first, its suitability to the climate; second, its high productiveness; third, its biennial character; fourth, it is a "legume," and fifth, it may be grown as an intertilled crop.

Sweet Clover grows nearly a month before corn is up and generally remains green for a month after corn freezes in the fall. It is seldom seriously injured by spring or fall frosts. It is a crop peculiarly suited to the short growing season and the severe temperature conditions of Western Canada. At Saskatoon Sweet Clover, when sown in rows, has yielded more than any other forage crop, and rather more than corn during each of the last two seasons. It is rich in nitrogenous compounds, but unless cut in the early stages of growth, is neither as palatable nor as digestible as most of our other crops.

The biennial character of Sweet Clover is much in its favor. The chief fault of all perennial crops, including alfalfa, Western Rye grass, Brome grass and Timothy, in a dry climate, is that they give no favorable opportunity for storing a surplus of moisture after the year they are sown. As a result no perennial yields large annual returns under dry conditions after the first crop.

It has been observed also that Sweet Clover land is much more easily plowed than alfalfa land, for the reason that after the second season, the Sweet Clover roots are dead and partially decayed and do not therefore increase the draft in plowing. It is common knowledge that alfalfa fields are plowed only with great difficulty.

Sweet Clover is a nitrogen gatherer. In this respect it is not different from the commonly grown clovers and alfalfa. It is an

interesting fact that the bacteria that produces the nodules on Sweet Clover is the same species as that which is used to inoculate alfalfa. The roots of a Sweet Clover crop that was inoculated with alfalfa bacteria, were found in our experiments here to be carrying dense masses of nodules.

When sown in rows two and a half or three feet apart and cultivated the crop yields more than when sown in close rows with more seed and it is our opinion that the crop following will be much greater where wide rows are used than where the seed is sown in the ordinary manner. Definite data on this point will be available within a short time. It should be pointed out in this connection that a much finer quality of hay may be secured from the thick seeding than from the use of wide rows. It would seem that unless the crop is used altogether for pasture or possibly for silage that the coarseness due to thin seeding will be such a disadvantage that this practice will not be found satisfactory.

It has been claimed that Sweet Clover is resistant to alkali soils, and considerable evidence has been advanced supporting this contention. It has been observed, however, at several places in Saskatchewan this year that it did not prove satisfactory on certain of our alkaline soils. It is possible that the crop is somewhat resistant to alkali but it will not grow under badly alkaline conditions.

It is probably well known that Sweet Clover is looked upon with favor by apiarists as a valuable honey plant.

THE CULTURE OF SWEET CLOVER.

Like most other crops Sweet Clover will do best if sown on fallowed land. On account of its biennial nature, however, this preparation is too costly. Quite satisfactory stands can be secured from sowing on well worked fall or spring plowing that is free from grass. The surface soil should be quite firm and the seeding should be done in the rainy time—generally in the month of June.

If sown in rows 24 to 36 inches apart, 3 to 6 pounds per acre is sufficient. When sown broad-cast or in 6 inch rows, 8 to 12 pounds or more should be used.

In most seasons the crop will grow from 1 to 2 feet high the first year. This may be either pastured off or cut for hay as desired. The following year the first crop is generally ready to cut the latter part of June, and the second crop the latter part of July or early August.

Sweet Clover needs to be well cured in the swath, windrow or cock before being stored in either stack or barn. If the crop is used for pasture only, the tall growing stems that get ahead of the stock should be clipped back occasionally with a mower to prevent seeding and to encourage the development of fresh green shoots.

In case it is desired to grow the crop for seed it should not be cut for hay early in the season. Yields of from 6 to 12 bushels of seed have been reported. For this purpose rows 2 to 2½ feet apart would seem to give the best results. It has been observed that when grown in rows 40 inches apart the seed is later in ripening and there-

fore most subject to injury from fall frosts than when sown in closer rows.

EXPERIMENTS UNDER WAY AT SASKATOON.

At the present time we have under observation eight different species of Sweet Clover. Two of these we are growing in rows at different distances apart both for hay and seed. We are also planting them at different rates per acre, and at different times in the season. We propose to test *Melilotus Alba* for both hay and pasture purposes, and to study its value as a silage crop.

GENERAL CONCLUSIONS.

At present the probable usefulness of Sweet Clover in Western agriculture seems to lie in its value as: first, a two season pasture crop; second, a possible hay crop if cut early; third, a possible silage crop, which either alone or mixed with Winter Rye or Corn *may be* found of value. If use can be made of the coarser growth from wide rows intertilled, this method of growing will probably be found the best under semi arid conditions. It will at the same time produce some of the desirable effects of an intertilled crop.

It should not be forgotten, however, (1) that Sweet Clover is bitter, particularly in the later stage of its development, (2) that it is coarse in texture and therefore unpalatable, and in the mature condition relatively indigestible, (3) that it is hard to cure on account of its large moisture content, (4) that it may become an undesirable plant in alfalfa seed growing centres, and (5) that much more information must be obtained concerning it before it can be either rejected as being worthless or as being more harmful than beneficial, or accepted as a forage crop suitable for general use.

Sweet Clover has many good qualities and some very bad ones. If the latter can be overcome the crop will have a very important place in our agriculture. If they cannot be overcome it will occupy only a very limited sphere of usefulness. Investigations now under way should give such added information as is necessary to determine the relative value of Sweet Clover among our forage crops.