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Crimson Clover: Its Possibilities in Kentucky

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Cover crops of any kind conserve fertility by preventing erosion of land and leaching of plant food from the soil. Crimson clover being a leguminous crop not only conserves fertility but when plowed under increases it by adding to the soil the nitrogen which it has taken from the air. The use of cover crops is of such importance in Kentucky that no farmer can afford to neglect sowing them. Crimson clover, because of its great possibilities for adding nitrogen to the soil economically, is well worth a thoro test by any farmer.

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Crimson Clover: Its Possibilities in Kentucky

By E. J. KINNEY

Where crimson clover can be grown successfully there is probably no other crop as valuable for adding nitrogen and organic matter to the soil economically. Its great value is due to the fact that almost the entire growth is made during the season when the land is not occupied by the ordinary summer crops. The plant is a winter annual, that is, the seed is sown in late summer or early fall and the crop matures the following spring. In Kentucky crimson clover is in full bloom about the first of May and ripens seed in June. The plants have acquired their full amount of nitrogen when in full bloom so that if plowed under at this time the maximum benefit, as far as adding nitrogen to the soil is concerned, is obtained, and there is yet ample time to mature corn, tobacco and other crops. Large quantities of nitrogen are taken up by crimson clover in the early stage of growth and even if the plants are only a few inches high when plowed under, a thick stand will add considerable nitrogen to the soil.

When climatic conditions permit the most perfect utilization of crimson clover, as in parts of the eastern states, it is possible to raise corn, potatoes or other cultivated crop every year on the same land and still maintain an adequate supply of soil nitrogen. In such cases the clover is sown in the cultivated crop during late summer and plowed under in sufficient time to plant to the summer crop again the next year. It must be understood, however, that a stand of crimson clover can be obtained by seeding in corn, tobacco, etc., only when showers are of frequent occurrence at the time the clover

is seeded. A much more certain way of obtaining a stand is to seed after wheat or other small grain crop is removed. This permits making a good seed bed, accumulating some moisture and getting the seed sown evenly and well covered. This method of seeding is applicable over a much larger territory than seeding in standing crops and while rather expensive, is practical in many cases. The small farmer can plant the maximum acreage to cultivated crops each year, when he can raise crimson clover, and the farmer without much live stock will find crimson clover a good substitute for animal manures.

CRIMSON CLOVER FOR KENTUCKY

Crimson clover has been grown to a limited extent in Kentucky for perhaps 30 years. In some sections of southwestern Kentucky it is grown quite successfully, but in most parts of the State it has not been given a thoro trial. It's great value justifies careful and extensive tests in all portions of the State and especially in the southern half. It is supposed that a temperature of 4° below zero, Fahrenheit, is fatal to the unprotected plants, but even in the northern part of Kentucky the crop is seldom killed by cold. The difficulty of securing and maintaining a stand is the chief cause of failure, rather than winter killing. Most of the trials with crimsom clover have been made by sowing in corn and this probably accounts largely for the frequent failures and the general belief that its culture is not practical in Kentucky. Desirable from an economical consideration as this method of seeding may be, the risk of failure is so great that it should seldom be attempted. Perhaps in not more than one year in five is there sufficient rainfall in late summer to bring the plants up and maintain them until well rooted. Even when a stand is secured, the cultivated crop draws so heavily upon the moisture supply later in the season that the plants do not usually make sufficient growth to stand the winter successfully. This may not be true in bottom lands or in other lands which retain moisture exceptionally well.

The farmers in Kentucky who have made a success of crimson clover, and there are quite a number, almost without

exception seed after small-grain crops. The writer is acquainted with several men who succeed four years out of five by this method and most farmers would be glad to go to the necessary expense if they could obtain similar results.

SECURING PROPER CONDITIONS FOR SEEDING

It should be emphasized that the most important essential in securing and maintaining a stand of crimson clover is to have a good supply of moisture in the soil at seeding time so that the seed will germinate promptly and the young plants become established.

Many failures have resulted from sowing after a light shower which furnished only enough moisture to cause the seeds to germinate, but not enough to support further growth. The young plants are quite delicate, and a few hours of hot sun, when the soil is dry, will prove fatal. The proper method is to store up all the moisture possible by early plowing and preparation of the seed bed and then to take advantage of the first shower during the seeding period for sowing the seed. Even if very dry, it will pay to use sufficient power to get the land plowed early. Plowing need not be deep, 5 inches being sufficient. When the land is not too hard and is free from weeds, a thoro disking may take the place of plowing, but plowing is preferable as it covers shattered grain deeply, preventing a volunteer growth, and helps to destroy grasshoppers and other insects. As fast as the land is plowed it should be worked down by disking, dragging and rolling so that all the rain that falls may be conserved and a firm seed bed secured. A tractor is of great value in plowing hard stubble land and especially in working it down after plowing. Heavy machinery can be used which is much more effective in pulverizing hard clods than the ordinary implements drawn by a team of horses or mules. If possible the land ought to be plowed and prepared by the first of August. Sowing should not be attempted until a rain sufficient to wet the soil thoroly occurs. In case of a light shower the ground should be rolled and harrowed again. Then the seed should be sown after the next shower. Of course if the soil is moist when plowed, the

seeding can be done after even a light rain. There are few seasons in Kentucky when soils cannot be gotten into very good condition for seeding crimson clover provided the land can be plowed early. In the event that sufficient moisture is not available before September 1, it is not advisable to risk seeding under such conditions; rye or wheat should be sown instead.

FERTILIZERS FOR CRIMSON CLOVER

Crimson clover is not a poor-land crop and it will make a disappointing growth on thin land. It should be regarded as a crop for maintaining fertility rather than one for restoring badly worn soils. Cowpeas and sweet clover are much better suited for restoring fertility than crimson clover. The crop has no marked adaptations as to type of soil, altho it is believed to thrive best on a loam or sandy loam. It is not adapted to poorly drained land because it winter kills badly under such conditions. Crimson clover is more tolerant of an acid soil than red clover and one advantage it possesses over the latter is its ability to grow on soils too acid for red clover.

As crimson clover is usually planted after a small-grain crop, the residue of whatever fertilizers were used for the grain is generally depended upon to supply the needs of the clover. It is certainly desirable, for example, to use sufficient phosphorus for wheat, or whatever the grain crop may be, so that it will not be necessary to fertilize the clover which follows. Such a practice saves work and trouble. Some carrier of phosphorus, such as acid phosphate or basic slag, is probably the only fertilizer that it will pay to use on crimson clover in Kentucky. Fertilizer applied especially for the crimson clover ought to be added after the ground is plowed and thoroly worked into the soil.

INOCULATION

Crimson clover is a true clover and the same kind of nodule bacteria grows on its roots as upon the other clovers, red, alsike, white, etc. Since some of these clovers grow in practically every part of Kentucky, it is very doubtful if there is any section where natural inoculation does not occur. It is

barely possible that in a few instances clover has not been grown for so long that the organism has disappeared from the soil. This would be most likely to occur in fields that had been continuously cultivated for many years. As a rule, however, the artificial inoculation of crimson clover in Kentucky may be regarded as a waste of time and money. Where farmers are desirous of testing inoculation the easiest way is to buy some of the artificial culture for sale by seedsmen and manufacturers. The directions for use always accompany the cultures.

TIME AND METHOD OF SOWING

In Kentucky July 20 to August 20 is the period during which seeding can be safely done. Probably the first 15 days in August is the most favorable period. Crimson clover sown very early is likely to be injured by hot weather, while if sown later than the date given above the growth is likely to be insufficient to withstand the winter. In the southwestern part of the State, however, seeding done in early September is usually successful, provided conditions at that time are favorable for rapid growth. Spring seeding is useless in Kentucky. Seeding alone is generally the most practical method, altho many farmers prefer to sow rye or winter barley with the clover. Winter oats is an especially desirable crop for use with crimson clover, but not a very reliable one in Kentucky. Considering that the moisture content of the soil is the factor most often causing failure, it is of course true that the clover is most likely to make a satisfactory growth where it does not have to share the moisture with a small-grain crop. If grains are used the amount should be small—not over a half bushel of rye or three pecks of barley. In southeastern Kentucky the custom of sowing both red and crimson clover with buckwheat has been practiced to an increasing extent in recent years and the farmers of that section regard it as a very reliable method of securing a stand of clover. The crop of buckwheat is a good money crop and from the financial standpoint the method must be considered very practical.

Because of the limited moisture supply, sowing with cowpeas, soybeans, millets, etc., is very likely to result in failure.

RATE OF SEEDING AND SEEDING OPERATIONS

The amount of seed sown varies from 12 to 25 pounds of clean seed per acre. Perhaps the rate most commonly used in Kentucky is 15 pounds per acre. If the seed is of good quality and the seeding done so as to secure good covering in moist soil, 15 pounds is ample. In fact, 10 to 12 pounds is sufficient to give a good stand under favorable conditions. Where seed is used in the hull, a few pounds more should be sown.

Undoubtedly the ideal way of sowing crimson clover is with the clover-seed drill. With the drill every seed can be put into moist soil and the covering is uniform. The drill cannot be used successfully unless the seed bed is firm and smooth, but, as stated previously, a firm seed bed is so essential in sowing crimson clover that the land ought to be disked and rolled until it is secured. If necessary to plant on a loose seed bed, the writer has found it an excellent plan to run over the field with the culti-packer just before seeding and to cover the seed with a weeder or spike-tooth harrow. Unless the soil is quite moist, it is very essential to roll after seeding. The seed must not be covered deeply—not over an inch even in light soils—and in hot weather loose soil will quickly dry out to this depth, causing the young plant to perish before becoming well rooted. Rolling firms the soil and brings the moisture to the surface. A type of roller such as the culti-packer or other clod crushing type is preferable to a smooth roller. Crimson clover germinates so quickly in a most soil that there is not much danger of a heavy crust being formed before the plants appear, even if a hard rain should occur. The importance of rolling after seeding cannot be too strongly emphasized. Care in seeding, it should be stated again, is absolutely essential to success, and unless the farmer is willing to take every precaution that will insure favorable conditions he had better let crimson clover alone.

UTILIZING CRIMSON CLOVER FOR HAY AND PASTURE

It is probably unwise to pasture crimson clover to any considerable extent in the fall because it weakens the plants and reduces the chances of their surviving the winter. Crim-

son clover starts growth very early in the spring and is in condition to pasture for 6 to 8 weeks. Usually, however, the ground is so wet during a good part of this time that not much pasturing is possible. Cattle will bloat on crimson clover as readily as on other clovers. The addition of nitrogen to the soil is less when the crop is pastured off than when it is plowed under.

Crimson clover makes very good hay if cut when in full bloom, but is rather difficult to cure. In addition the weather at that time is likely to be unfavorable for making hay. It should be handled like red clover. Crimson clover that has gone much past the period of full bloom makes hay that is dangerous to feed to horses because the hairs on the blossoms become hard and stiff and are likely to form "hair balls" in the intestines of the animals. This, it is said, nearly always results in death. This does not occur with cattle and sheep, however.

A good stand of crimson clover will yield from one to two tons per acre. In mixture with oats, wheat, etc., the yield is usually better and the hay more easily handled so that if the crop is intended primarily for hay, it is probably advisable to seed a small grain with the clover. On the average farm crimson clover will pay better if plowed under than if utilized for hay; where the crop is removed, there will be little if any gain of nitrogen in the soil.

SEED PRODUCTION

Crimson clover seeds rather abundantly, surpassing red clover in this respect. In seed growing sections the average yield is about 6 bushels per acre, and yields of 8 to 10 bushels are sometimes secured. A yield of 5 bushels may be considered satisfactory in Kentucky. The seed is harvested when fully ripe, which is about the middle of June in Central Kentucky. It is usually possible to raise a crop of cowpeas, soybeans, or even a crop of silage corn after the seed crop is removed, provided the land can be plowed and fitted promptly. The seeds shatter easily and the crop must be handled very carefully. It is best to cut early in the morning or even at

night in order to prevent serious loss of seed. A mower with the buncher attachment is generally used, but a self-rake reaper is much better. If rain occurs before the clover is dry, the bunches should be carefully turned to permit the seed heads drying out quickly. If they remain damp for only a short time the seed will sprout, and in wet seasons it is often impossible to prevent serious losses from this cause. The clover huller is used to obtain clean seed, but seed in the hull, which is just as desirable for home use as the hulled seed, may be obtained by running the clover thru an ordinary grain separator or by flailing. Since the seeds shatter so easily, the wagon frame used in hauling should always be covered with a tarpaulin.

HOMEMADE COMB STRIPPERS FOR HARVESTING CRIMSON CLOVER SEED

When crimson clover is fully ripe the heads break off the stalk or stem quite readily. This fact makes it possible to collect seed advantageously for home use by using a homemade stripper somewhat similar to the bluegrass seed strippers used in Central Kentucky to gather bluegrass seed. Being homemade, however, the fingers are made of oak or other hard wood and are about 1¼ inches wide with the opening between the teeth ¼ inch wide at the top and ¾ inch wide below, the fingers being bevelled off on the under side to prevent choking. The length of these fingers varies from 10 inches in the hand stripper to two feet or more in the horse-drawn strippers. The completed stripper consists of a box or bed for collecting the seed as stripped and to the bottom of this the fingers are fastened. Strippers can be made of any desired width and may be mounted on wheels or hung between the wheels of a cart or buggy. The bottom of the horse-drawn strippers should be about 10 inches from the ground and some device should be used by which the box can be tilted to accommodate it to clover of varying heights. It is said that a stripper 3½ feet wide will strip two acres per day, which will make ordinarily enough seed to plant 10 acres. A surprisingly large percentage of seed can be saved by these machines if properly operated.

The construction and use of the homemade striper is described in detail in Farmers' Bulletin 646 of the United States Department of Agriculture, and anyone interested in making such a stripper should secure this bulletin. It can be obtained upon application to the Bureau of Publications, United States Department of Agriculture, Washington, D. C.

Crimson clover seed is quite round and much larger than red clover seed. New seed is pinkish in color and shiny. Old seed is darker in color and lacks the luster of new seed. In buying seed care should be taken to see that it is fresh, for even two-year-old seed is practically worthless. Crimson clover seed germinates very quickly—usually in about 4 days. The seed is usually quite free from weed seeds. The weight is the same as red clover seed—60 pounds per bushel.

DISEASES AND INSECT PESTS OF CRIMSON CLOVER

About the only disease that affects crimson clover in this State is stem rot. This is characterized by the wilting and dying of the plants which upon examination will be found to be rotting off just below the crown. Sometimes the disease kills a large proportion of the plants. It also attacks red clover and alfalfa. The effects of the disease may be apparent at any time during fall, winter or early spring. Gilbert and Myer* suggest as the best method of combating the disease a rotation of crops in which clover does not occur at very frequent intervals or substituting cowpeas or other legume for clover.

Grasshoppers are the most serious insect enemy of crimson clover, the injury occurring in the late summer and fall just after the plants appear. Often the plants are all destroyed around the edges of the field and occasionally entire fields of young clover may be destroyed. Usually, however, if the land is plowed for the clover, the damage will be confined to the edges, as the plowing destroys most of the hoppers in the field. The poisoned bran bait scattered around the edge of the field is the only effective way of destroying the insects and this is hardly practical unless the hoppers are so numerous

*Kentucky Experiment Station Circular No. 8.

that they penetrate far into the field. This bait is made by mixing 25 pounds of bran with 2 pounds of Paris green. This is moistened slightly with water and a quart of molasses added. The bait should be sprinkled around the edge of the field in early morning and renewed until the grasshoppers are destroyed.