

Crimson Clover

Crimson clover (*Trifolium incarnatum* L.) is among the most widely planted annual forage legumes in the United States. A native of the Mediterranean region, it is believed to have been introduced into the United States in 1818. It has had many other common names in various parts of the world, one of the most widely used being "incarnate clover."

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DESCRIPTION

Crimson clover produces large leaves with rounded tips and no leaf marks, it has a taproot accompanied by numerous small fibrous roots, and both leaves and stems are covered with dense, short hairs. The blooms have a conical shape, and often contain over 100 florets that open in succession beginning at the bottom of the bloom. The florets typically are bright red or crimson, making this one of the most spectacular clovers when in bloom. Plants with florets of other colors, including white, have been reported, however.

ADAPTATION AND USE

Crimson clover can be grown as a winter annual from Kentucky southward and from east Texas to the Atlantic ocean, though it is most commonly grown on sandy, droughty soils in the Deep South where perennial clovers are not well adapted. It can also be grown as a winter annual in the western parts of the Pacific Northwest, and is sometimes grown as a summer annual in Canada or the extreme northern portion of the United States.

Crimson clover is a versatile plant used to produce forage for livestock, for soil conservation, as a green manure crop, as a source of pollen and nectar for bees, and for land beautification. It has good seedling vigor and makes rapid growth in autumn and especially in late winter/early spring. Thus, it can be used in many crop production situations which involve summer forages or row crops. It is one of the most dependable, best-yielding, and earliest-maturing winter annual legumes.

Crimson clover can be planted on a prepared seedbed or can be seeded into the dormant sods of warm season perennial grasses such as bahiagrass or bermudagrass. It can be grown in pure stands, especially for green manure, but when grown for forage it is usually planted with small grains and/or annual ryegrass, as this increases forage yield and extends the grazing season. If well established before winter, it makes more growth during cold weather than most other annual legumes.

ESTABLISHMENT

One of the advantages of crimson clover is that it is relatively easy to establish. General recommendations are provided in the following sections, but readers should refer to state and local sources for specific recommendations for their area.

SOILS AND FERTILITY: Crimson clover is best suited to sandy but not excessively droughty soils, but can be productive on well-drained clay soils. It yields best when grown on soils with at least medium levels of phosphorus and potassium, though exact levels of fertilizer applied should be determined by a soil test. Application of about 2 pounds of boron per acre may be required if reseeding is desired, especially if the clover is being grown on sandy soil.

With plantings on a prepared seedbed, it is best to make initial seedbed preparation at least 6 weeks prior to planting if possible, as this allows time for the soil to settle and for some of the weed seed in the soil

to germinate. Fertilizer is normally incorporated during final seedbed preparation. When the clover is planted into a sod, fertilizer can simply be broadcast on the soil surface.

Crimson clover is more tolerant of soil acidity than some legumes, but normally does best when the soil pH is within the range of 5.8 to 6.5. If lime is needed and the clover is being planted on a prepared seedbed, it should be incorporated into the soil prior to planting. Iron chlorosis can be a problem on alkaline soils.

If grown in a pure stand, no nitrogen (N) fertilizer should be applied, as nitrogen-fixing bacteria will meet the needs of the clover. Nitrogen recommendations for crimson clover/winter annual grass mixtures vary from state to state. Usually at least 20 pounds of N/acre are applied at planting, or application of as much as 60 pounds of N/acre are applied, but the application is delayed until early winter.

VARIETIES: A number of crimson clover varieties have been released, many of which are no longer commercially available. Varieties differ with regard to forage yield, distribution of growth, and blooming date.

It is best to use early-maturing varieties when the clover is overseeded on summer grass sods or when it is to be used as a green manure crop, because in these situations it is desirable to minimize overlap with summer grass growth or to terminate clover growth in early spring.

In situations in which these points are not of concern, later-maturing varieties may be preferred. Careful selection of the variety which best

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meets a producer's needs can greatly affect the level of satisfaction that results from a planting. Unbiased field studies conducted by universities is the best source of variety comparison data.

SEED QUALITY: It is always important to use good quality seed (preferably certified seed) known to be free of noxious weed seed. It is safest to purchase seed of named cultivars as opposed to "common" crimson clover seed.

SEEDING RATES: Normally, 20 to 30 pounds of seed per acre is recommended when crimson clover is planted in pure stands. A thick stand, such as should be obtained with 30 pounds of seed/acre, results in more autumn and winter growth. If planted with small grain and/or ryegrass, 15 to 20 pounds of crimson clover seed/acre should be adequate. To avoid excessive competition for the clover, seeding rates of small grain and/or ryegrass in mixtures should be no more than 90 and 15 to 20 pounds/acre, respectively.

SEEDING DEPTH: Ideally, crimson clover seed should be covered with about 1/4 inch of soil. It is better for the seed to be on the soil surface than to be covered with more than 1/2 inch of soil.

SEEDING DATE: In the South, crimson clover is normally planted in September or October. If it is being planted on a prepared seedbed, seeding in early autumn will result in more autumn and early winter growth. When planted on a warm season grass sod, the planting date should be close to the usual date of the first killing frost.

SEED INOCULATION: Unless pre-inoculated, crimson clover seed should be inoculated with fresh inoculum just before planting. It is important to make certain that the inoculum used is specifically labeled as being suitable for use on crimson clover seed. The seed should not be mixed with fertilizer as this can kill the bacteria within the inoculum.

SEEDING METHOD: Crimson clover seed can be planted with a drill, with a cultipacker-seeder, or can simply be broadcast. The most common method is to broadcast the seed.

Prepared Seedbed – When planting on a prepared seedbed, use of a cultipacker-seeder to plant crimson clover and ryegrass seed, or use of a cultipacker after broadcast-seeding these forages will ensure good seed/soil contact and increase the likelihood of obtaining a stand, especially on sandy, loose soil. If small grains, which have a larger seed, are to be in the mixture, the small grain seed is normally planted with a grain drill, or is broadcast and disked in prior to planting small-seeded species.

Overseeded On Summer Grass – When crimson clover is planted into a warm season perennial grass sod, most of the grass residue should be removed by grazing, burning, or mowing prior to planting. Light disking may be necessary to ensure good seed/soil contact on thick, tight sods, especially in the case of bahiagrass. Seed can then be broadcast over the soil surface or shallowly drilled. If the seed are broadcast, either subsequent heavy stocking of the area with livestock or a light disking may enhance germination and establishment.

PEST CONTROL: Newly-planted fields should be monitored for pests (insects, diseases, and weeds). In particular, soil insect pests can sometimes be a problem during establishment, especially when clover is sod seeded. If problems arise, identification of the pest(s) and timely implementation of a suitable control strategy are critically important. Whenever pesticides are used, it is important to read and follow all label instructions.



MANAGEMENT

Once established, crimson clover needs to receive appropriate management in order to realize its potential productivity. Some important considerations are as follows.

FERTILITY: Phosphorus, potassium, and lime applications made in autumn according to soil test recommendations should be adequate to take crimson clover or a crimson clover/winter annual grass mixture through the spring growth period. In addition to whatever level of N may have been applied in autumn or winter, an additional application of around 60 pounds of N/acre is usually made to crimson clover/grass mixtures in late winter.

PEST CONTROL: As discussed in the establishment section, periodic monitoring of stands followed by appropriate action to thwart the effects of the particular pest(s) identified is the key to preventing severe losses or damage from pests.

Insects – Several species of insects may damage the foliage of crimson clover and require either treatment with an insecticide or a quick grazedown. However, foliage-damaging pests are usually not a problem.

Diseases – Crown and stem rot may be a problem during cool, damp weather if there is significant forage accumulation. Removal of some of the foliage by grazing will be helpful in such cases. Rotation of crimson clover to other areas for a few years will reduce the likelihood of subsequent problems with these diseases.

Weeds – Some weed pests can be controlled with herbicides or by clipping. However, the best weed control is provided by a thick, vigorous stand of forage plants.

GRAZING MANAGEMENT: When grown in combination with winter annual grasses, care should be taken to prevent excessive grass growth from shading out the clover plants, especially early in the growing season. Increasing the stocking rate or allowing animals access to a pasture earlier than had been planned may be necessary to accomplish this.

Ideally, crimson clover should not be grazed until the plants are 4 to 6 inches tall. Turning livestock into a pasture when plants are small and the soil is moist can result in damage to the stand by hoof action, especially on prepared seedbeds. Crimson clover should not be grazed closer than around 3 inches. Given the potential problems associated with either undergrazing or overgrazing, careful observation of pasture stands followed by appropriate grazing management is advisable.

Autumn growth of any overseeded winter annual forage, including crimson clover, is considerably lower than when planted on a prepared seedbed in early autumn. As a result, the total production from overseeded stands is less, and the beginning of grazing will be delayed by two months or more.

MANAGEMENT FOR RESEEDING: It is relatively easy to manage crimson clover for reseeding, but it requires sacrificing some of the forage potential of a stand. Some varieties were selected for a higher percentage of hard seed, but hard seed of crimson clover do not persist in the soil as long as is the case with some other winter annual clovers. Thus, if reseeding is desired, crimson clover should be allowed to make seed every year.

Reseeding requires either that livestock be totally removed, or that the stocking rate be greatly reduced, during the seed production period. Reducing or eliminating grazing pressure should be done soon after the clover begins to bloom (usually late March or early April). Crimson clover seed mature within about 30 days of pollination. Once mature seed have been produced, the field can be grazed or cut for hay during summer (or have a summer crop no-tilled into it), but nitrogen fertilizer should not be applied after around mid-summer.

Clover head weevils sometimes attack crimson clover and greatly reduce seed production. They can be controlled with insecticide applications, but bees



are required for pollination and for good seed yields of crimson clover, so any use of insecticide needs to be done with great care to minimize the impact on bees.

Plant residue should be removed by heavy grazing, close mowing, or burning in mid- to late autumn. Light disking of the soil may be beneficial, especially if there is a tight sod present. Any needed fertilizer (usually including 2 pounds of boron/acre) or lime should be applied according to soil test recommendations. In a field being grazed, the animals do not need to be removed until clover seedlings begin to emerge.

Management For Green Manure: Crimson clover can be an excellent green manure crop, often providing more than 100 pounds of nitrogen per acre. Green forage of crimson clover normally contains about 0.75 to 1% nitrogen; dry forage about 3 to 3.5% nitrogen. The maximum quantity of nitrogen is accumulated when crimson clover is allowed to reach the late bloom stage prior to being killed or turned under. A crop which immediately follows the clover can then use the nitrogen for its growth.

Accumulated forage should be killed or turned under at least 3 weeks prior to planting another crop. In nut or fruit orchards the clover plants can simply be allowed to make seed and die. Some herbicides used on summer crops may inhibit crimson clover germination and/or growth.

When crimson clover is overseeded on a summer grass sod, a good stand will usually provide at least 60, and sometimes well over 100, pounds of nitrogen/acre to the grass, even if grazed closely or harvested for hay in spring. This nitrogen is in a slow release form which is particularly beneficial in pasture situations.

MECHANICAL HARVESTING: Mixtures of crimson clover and winter annual grasses can make excellent quality hay or silage. Early spring growth of crimson clover often contains more than 20% crude protein and can be as high as 80% digestible. Even at full bloom the forage may contain 12 to 14% crude protein and 60 to 65% digestible nutrients on a dry matter basis. Crimson clover alone often produces 1 to 2 tons of dry matter per acre, while mixtures with winter annual grasses usually yield considerably higher.

Unfortunately, spring weather conditions in the Southeast often make hay harvest at the correct time difficult. In addition, crimson clover forage dries slowly, prolonging the period of vulnerability to rain damage. Consequently, forage of winter annuals, including crimson clover, is most frequently harvested by grazing or as silage.

Winter annual mixtures containing crimson clover planted on a prepared seedbed in early autumn can often be grazed until early to mid-March and still produce a hay or silage harvest. Harvest should be made at the early bloom stage of the clover. Regrowth from crimson clover after mechanical harvesting is usually poor, so only one harvest can be expected to contain significant quantities of clover.

ANIMAL DISORDERS

Overly mature blooms of crimson clover in hay contain barbed hairs which may be dangerous to horses. Harvesting promptly after the clover begins to bloom avoids this problem.

It is also possible for animals grazing crimson clover to bloat, but the likelihood is much less than for white clover or alfalfa. Planting grasses with the clover, providing dry hay to animals during periods of lush growth, avoiding turning hungry animals into a lush pasture, and providing anti-bloat materials are approaches for avoiding bloat problems.