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White clover (*Trifolium repens* L.) is probably the most widely distributed legume in the pastures of northern Michigan. Where adapted, it is possible to convert unproductive "native" pastures into productive, nutritious and profitable white clover pastures by some simple management practices. Few pasture systems will provide such dividends for such a small investment.

Small, Medium, and Large

There are three different types of white clover—small medium, and large—which are quite similar except for size. Ladino is the large, or giant white clover. Ladino has been used in Michigan pastures for a number of years but requires careful management and tends to be rather short-lived. Common white clover or "white dutch clover" is the medium-sized clover which is sometimes used in pasture and lawn seed mixtures. Wild white clover is the smallest and best adapted of the three to the pastures of northern Michigan. Hereafter, references to white clover will mean only wild white clover.

Seeding is Seldom Necessary

White clover is very widely distributed despite the fact that it is not a native of this country. It was introduced from Europe by the Pilgrims. This "naturalized" plant has now become so widespread that seeding is seldom, if ever, necessary. Cutover forest lands have often been turned into excellent white clover pastures in a short period of time without seeding.

White clover followed the settlers west and quickly established itself on much of the "new" ground. As the fertility of these soils declined over the years, the white clover largely disappeared. Today it is easy to demonstrate that top dressing with phosphate fertilizer (potash, when necessary) along with a program to control the competition will bring about the rapid re-establishment of excellent white clover stands.

On a favorable site, all that is required is to meet the white clover's fertility needs and to keep the low-growing clover plants from being shaded out by

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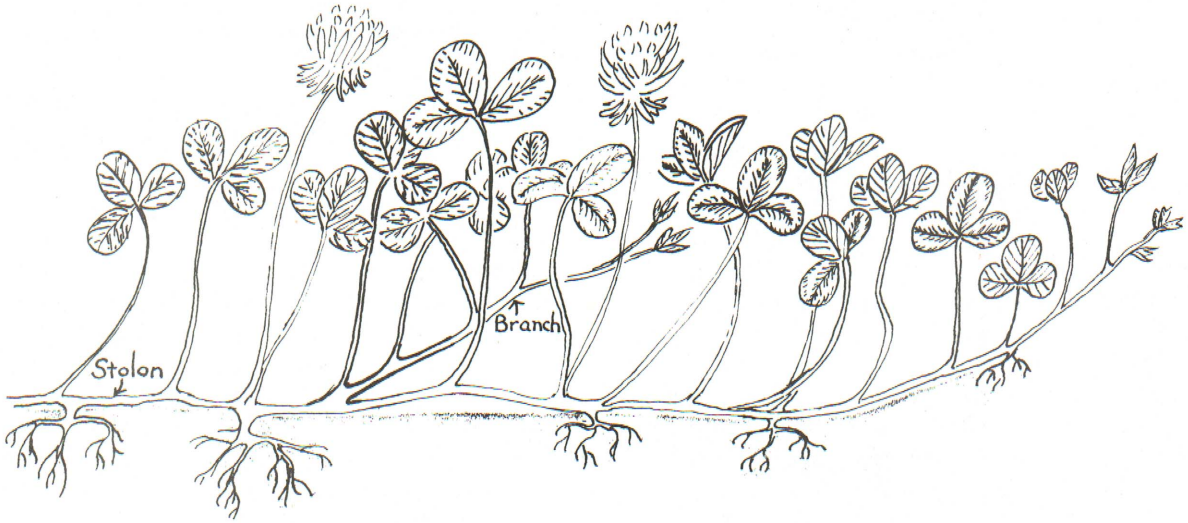

Fig. 1. Wild white clover at approximately actual size. Shows branched, creeping, fleshy stem (stolon) with leaves, roots and flowers growing directly from the nodes.

taller-growing grasses. In a short time, the few unproductive plants which happen to be present will flourish, and a high percentage of seedlings from seed present in the soil will thrive.

Where the soil conditions are right, unproductive "native" pastures which contain only grass and weeds can be converted into productive white clover pastures in one, or, at most, two years.

The same conditions under which white clover flourishes are favorable for Kentucky bluegrass, and it will also volunteer without seeding. Therefore, most white clover pastures are actually a mixture of white clover and Kentucky bluegrass.

White clover-Kentucky bluegrass pastures produce very nutritious grazing approaching a carrying capacity of a beef cow with suckling calf per acre. The same land as an unimproved "native" grass pasture may require four or five acres to provide the same quantity of feed, and it is much less nutritious.

Soils and Roots

Wild white clover has a fleshy, branched stem called a stolon which creeps along the soil surface like a strawberry runner. The leaves and roots grow directly from the nodes, or joints, along the prostrate stem, resulting in a shallow root system and low-growing above-ground portion (Fig. 1).

The shallow root system limits the adaptation of white clover to heavy soils and low-lying, light-textured soils which have a good supply of moisture throughout the growing season.

Fertilization

The rate of fertilization can best be determined by a soil test, but, generally, applications of 200-300 pounds of 0-20-20 per year will suffice. Equally good results can be obtained with annual applications at the appropriate rate or applications every other year at double the rate.

Grazing or Clipping Effects

The creeping stem and low growing habit of white clover make it very tolerant of close grazing. The stem and buds are at the soil surface and thus protected so that the grazing animal removes only leaves and, sometimes, flowers. In contrast, the upright growing plant types lose leaves, stems, and buds to the grazing animal. With its entire above-ground portion gone, it must grow again from buds at the crown. White clover tolerates frequent defoliation by continuous grazing, while most of the upright growing plants cannot.

Frequent defoliation gives white clover and Kentucky bluegrass a definite competitive advantage over the taller-growing plants. However, with sporadic or infrequent clipping or grazing, the white clover and Kentucky bluegrass will be shaded by their taller neighbors. Continuous grazing is recommended for white clover pastures.

Palatability and Nutrition

The leaves are the most nutritious and palatable portion of a plant. When white clover and Kentucky bluegrass are grazed, the animals harvest mostly the leaves of legume and grass. This is particularly palatable to cows, sheep, and horses.

White clover also has the advantage of showing very little change in quality from early spring to late summer, while most other species deteriorate quite rapidly as they become more mature.

Grazing Management

Most Michigan cattlemen will have to revise their thinking about quality pasture to make good use of white clover and Kentucky bluegrass. It is easy to underestimate the production of these low growing species.

The best way to determine the carrying capacity of white clover pastures would be to weigh the calves to determine their rate of growth. However, since that is not practical, the best way is to watch the cows. If several cows are lying around chewing their cud, they must be getting enough to eat. On the other hand, if they are grazing almost continuously, they are likely to be short on feed. It is not possible to judge the carrying capacity of a white clover pasture while driving by on the road.

As mentioned earlier, white clover and Kentucky bluegrass are well adapted to continuous grazing. Pasture rotation, allowing taller species to compete, may even be harmful. An occasional clipping will eliminate the rejected growth of tall grasses and weeds and provide more uniform growth.

Bloat

Cattle bloat can be a problem on legume pastures but is greatly reduced in stands containing 40 to 50 percent grass. For this reason, bloat is not a real problem on white clover-Kentucky bluegrass pastures. Nevertheless, the usual precaution should be taken: have cows full of feed before turning them into a new pasture, and then keep them in the pasture as long as feed is adequate. If these simple management practices are used, there should be little or no danger of bloat.

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