

withstanding both hot and cold climates. They grow well in direct sunlight and partial shade, but do not tolerate dense shade. The dense growth of a second-year sweet clover plant produces enough shade to cause its own lower leaves to fall. Sweet clovers prefer calcareous or loamy soils with a pH level of 6.5 or greater. These two species occur in roadsides, abandoned fields, pastures, on railroad ballast, and in any unflooded, open natural community such as prairie.

Sweet clover is an obligate biennial; the plant puts its energy into developing a healthy root system during the first season and during the second season it flowers, sets seed, and dies. In the first growing season, sweet clover is entirely vegetative. A small, branched stem with pinnately compound, trifoliate leaves is visible. In late summer, the root continues to develop. By the second year sweet clover has a strong taproot and root crown from which new shoots emerge. The plants flower May–September, producing hardy little seeds that may remain viable in the soil for up to 30 years or more. After setting seed, the plant dies. Because sweet clover dies after the second year, seed production is critical for its continued existence; this is the key to controlling it. If the flowering stage of sweet clover is halted, so is the spread of the plant—as long as management procedures continue long enough to deplete viable seeds remaining in the soil.

Hand-pulling sweet clover is an effective control if done when the ground is moist and most of the root can be removed. The best times to hand pull sweet clover are in the late fall after the first-year plant root-crown buds have developed, or anytime early in spring before second-year plants develop flower buds. Fall weeding is recommended because (1) the bright green sweet clover is easily spotted within the yellowing prairie, (2) moist fall conditions and an immature first-year root make pulling easier, and (3) fall weeding is less stressful to native vegetation. However, sweet clover also is easily located in the spring because it greens up before native prairie vegetation. Hand-pulling in summer is labor-intensive and must be done consistently. This treatment is feasible for

light and moderate infestations, but may be too time-consuming in heavy infestations.

In large, dense colonies of sweet clover, cutting first- and second-year stems close to the ground with a hand-held scythe is effective if done after leaves on the lower stems have died (before flowering occurs) and up to early stages of flowering (before seeds form). Sweet clover usually does not resprout when the stems are cut close to the ground during this time.

Prescribed burning can control sweet clover. A combination of an April burn in the first year, followed by a May burn the next year is most successful in eradicating an even-aged stand of sweet clover. A hot, complete, first-year April burn scarifies sweet clover seeds, stimulating them to grow. A late-fall burn will also have this effect. A hot, complete, second-year May burn kills the emerging shoots before they go to seed. Heavily infested stands are best controlled performing the above sequence twice, separating each treatment by two years without burning. Problems with this method may arise if the burn is patchy, leaving viable seeds or second-year shoots unscathed.

In an uneven-aged stand of sweet clover, second-year clover may escape the harmful effects of the early first-year burn because their shoots were not fully emerged. These plants would live to set seed. In this case, a combination of other procedures can be used: (1) later spring burns (after shoots emerge, but before second-year plants set seed) in a sequence of three to five years, or (2) follow up the early burn with hand-pulling, if practical.

In an even-aged stand of sweet clover, fall mowing can speed up the two-year burn program: burn in April; mow first-year plants in August, leaving the stems behind to dry; and burn again in mid-late September.

Herbicide can be useful for controlling large sweet clover populations. Following a fall burn, hand spray individual seedlings with an amine formulation of 2,4-D according to label instructions in spring, before native prairie vegetation emerges. This treatment also is effective when plants are in the cotyledon stage (i.e., when seed

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**VEGETATION MANAGEMENT  
GUIDELINE: WHITE AND  
YELLOW SWEET CLOVER**  
[*Melilotus alba* Desr. and *Melilotus  
officinalis* (L.) Lam.]

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White and yellow sweet clover readily invade open areas and have successfully exploited many native prairies and open, unflooded communities. These sweet clovers are adapted to a variety of conditions,

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leaves appear in the development of the seedling). To reduce vapor drift, use an amine formulation of 2,4-D rather than an ester formulation. A 1% solution of Mecamine (2,4-D plus Dicamba) applied to the foliage as a spray is very effective. The herbicide, 2,4-D amine is selective for broadleaf plants.

When applying either herbicide described above, spot application should be done such that coverage is uniform and the entire leaf gets wet. Precautions should be taken to avoid contacting nontarget plants with the solution. Do not spray so heavily that herbicide drips off the target species. By law, herbicides must be applied according to label instructions and by licensed herbicide applicators or operators when working on public properties.

#### GENERAL REFERENCES

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- Kline, V.M. 1984. Response of sweet clover (*Melilotus alba* Desr.) and associated prairie vegetation to seven experimental burning and mowing treatments. Pp. 149-152 in Proceedings of the Ninth North American Prairie Conference. Tri-College University at North Dakota State University, Fargo.
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