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COLLEGE OF AGRICULTURE, HEALTH AND NATURAL RESOURCES
EXTENSION

HOW TO SUCCESSFULLY MAINTAIN A MEADOW

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The first three years of meadow establishment require both patience and management effort. As part of the overall meadow establishment protocol, **an effective maintenance plan should be developed before planting and is critical** to the successful longevity of a meadow. The most appropriate maintenance approach will depend on the scope of the project, maintenance budget, and method of installation (i.e., by seed or live plants). Annual weeds multiply rapidly in the first year, when meadow plants are small and sparsely populated within the meadow stand. Desirable perennials and grasses develop slowly. Therefore, managed growth of the meadow site is essential.

MEADOW MAINTENANCE: ESTABLISHMENT BY SEED

A meadow established by seed requires greater maintenance effort during the first two years of establishment than a meadow developed with small plugs or container plants. Maintenance tools may include string trimmers, a hand pruner (for small areas), hand rogueing tools (e.g., hoe), and a walk-behind, rotary, or tractor-mounted mower. A flail-type mower is the preferred mower for meadow maintenance, as it can mow above the terminal tips of young desired plants as it shreds the cut material and disperses it gently on top of the vegetation. Attachments can be purchased for most riding lawnmowers that allow mowing at 6" of height if the meadow is of a larger scale and too large for a string trimmer to be efficient.

RECOMMENDED MAINTENANCE FOR PERENNIAL/GRASS MEADOW, INCLUDING AN ANNUAL NURSE CROP (NO FLOWERING ANNUALS):

In the first growing season (*in a spring seeding, the first growing season is in the same year; for a fall seeding, the first full growing season starts the following spring)***:**

Perennial meadow plants will grow slowly, with an average overall height of 2-6", depending on the species. Annual weeds will proliferate and grow quickly if given the opportunity. A nurse crop is a quick establishing, clump-forming grass that can be used to reduce weed invasion, hold the seed or young plants in place, and protect the soil from erosion.

Perennial plants such as Joe Pye weed and Bee balm take time to establish, but the eventual reward is worth it. (Photo by Tom Barry)

1. To **avoid disturbing the fragile root systems** of the desired and delicate seedlings during their first year of establishment, resist aggressive pulling or digging of weeds in the first growing season.
2. **Correctly identify** which plants are intended to remain within the meadow and which plants need to be removed. **Know leaf shape of desired juvenile or immature plants and potential problematic weeds.**
3. To prevent weeds from growing too tall and outcompeting the desired perennials, **mow every 4-6 weeks to a height of 4-6".** Mowing frequency may need to be extended based on speed of establishment and the amount of available rainfall. **Mowing should be frequent enough to prevent weeds from growing taller than 12" or from developing seed heads.** This mowing practice is critical to ensure that developing perennial plants will receive adequate light during establishment and not be shaded by aggressive annual weeds.
4. Discontinue mowing at the end of the growing season (late October/early November) as plant growth slows.

In the second and subsequent years:

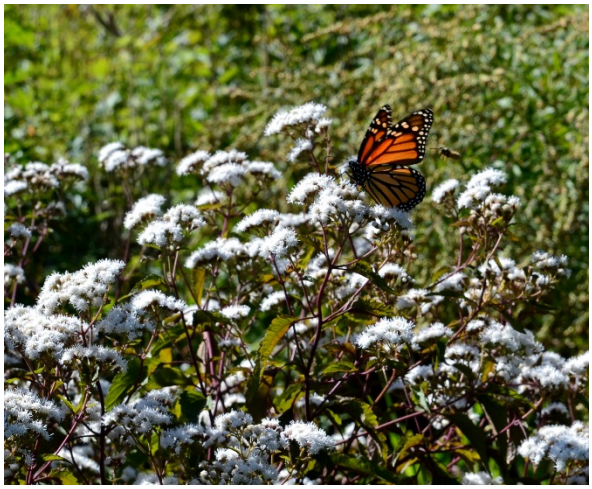
1. **Mow meadow vegetation to the ground annually, either in late winter or early spring,** before the next year's growth begins. If compacted soils and wet field conditions are a concern in early spring, the final mowing can be done in late fall or early winter. However, a late fall mowing is less preferred than mowing in late winter or early spring, as it prematurely removes protective winter habitat and available food for wildlife that might reside in the meadow during the winter months.
2. **In the second year, monitor for invasive plants and weeds all season long.** Perennial meadow plants continue growth and become more established. During the growing season, prevent the establishment of biennial and perennial weeds. **Annual weeds should be mowed or removed before developing flowers and seeds to prevent the dispersal of mature seed.** If needed, control weeds with spot herbicide applications (either synthetic or organic, such as minimum risk products), cut with a string trimmer, or physically remove them by hand or with equipment. After the second year, monitor the meadow for unwanted or invasive weeds at regular intervals throughout the season.
    - **Cutting vegetation to the ground is recommended** over hand-pulling or digging weeds, to avoid bringing buried weed seeds to the soil surface. Very small weeds can be pulled, providing that they have been identified correctly.
    - Some perennial weeds, such as mugwort and bittersweet, are encouraged to produce many new plants from the roots when they are cut at ground level. Once these weeds are established, it is very difficult to pull out all their roots. Instead, cut these weeds at a taller height (of 12-18") to encourage them to branch out from the original stem. Repeated cuttings will then zap their energy reserves and eventually kill them. Seedlings can be pulled.
3. **Avoid mowing the meadow stand during bird nesting season to prevent injury to young nesting ground birds.** Cease mowing by the end of April and refrain from mowing until late-July. Use of pruners or a string trimmer to address individual weeds during the "nesting" season also will protect valuable wildlife.

RECOMMENDED MAINTENANCE FOR PERENNIAL/GRASS MEADOW, INCLUDING FLOWERING ANNUALS:

Using annuals as part of the seed mix may be desired, for the quick and satisfying color they provide. If the meadow mix used for establishment contains flowering annuals, weed control may be a challenge in the first year. **Frequent mowing as a strategy to control weeds is not feasible** because the annuals in the seed mix also need to produce a seed stalk and set seed during the first year. Also, **the establishment of perennial plants will be more difficult**, as the quicker growing annuals grow faster and taller, developing a canopy that shades the slower-growing perennials.

If annuals are still desired, **successful weed control may take more effort**. Knowledge of competing weeds and their life cycles will be critical. Weed proliferation will be manageable with minimal disturbance to the soil.

1. **Correctly identify which plants are intended to remain in the meadow and which plants need to be removed.** Learn the most common weeds and invasive plants in the area, when to expect germination, and what the juvenile (seedling) leaves look like. Early detection of and action towards eliminating intruding weeds will prevent more difficult and time-consuming work if a weed becomes established.



Meadows provide habitat for many beneficial insects, such as the native praying mantis (above) and butterflies.

2. Avoid disrupting the fragile root systems of delicate seedlings and exposing more weeds seeds with soil disturbance. **Weeds should be controlled by spot cutting** with pruners, shears, a string trimmer or spot treatments of minimum risk products or glyphosate.
3. **Mow meadow vegetation to the ground annually, in late winter or early in spring,** before the next year's growth begins. Ensure that seed from reseeding annuals is dislodged to allow direct seed/soil contact.
4. If annuals are desired as a consistent part of the overall meadow composition, **a late fall dormant seeding or spring seeding of the meadow mix is recommended every 1-3 years** to reinvigorate and rejuvenate the flower composition.
5. **Maintenance after the first year is the same as described above**, but will likely require more spot control of weeds.




Four severely problematic weeds to eliminate in the meadow: (clockwise from top left) bindweed (Convolvulus arvensis), yellow nutsedge (Cyperus esculentus), Canada thistle (Cirsium arvense), mugwort (Artemisia vulgaris*). Know how to identify these and other common weeds as juveniles to eradicate them most easily and efficiently. *CT Invasive*

MEADOW MAINTENANCE: ESTABLISHMENT BY PLUGS/LIVE PLANTS

1. Throughout the first and second seasons, **scout and monitor site for invading weeds and remove any undesirable plants by cutting close to ground level or scratching out small weeds with a dutch hoe.** It is recommended that small weeds be clipped at the soil surface, rather than pulled, to minimize soil disturbance. Firm up soil in disturbed sites after pulling or digging weeds.
2. **Identification of both desired species and potential weed species is critical**, especially if the juvenile leaves differ in shape and size from the mature leaves.
3. **In the first and second years**, cut back the previous season's vegetation to ground height in late winter or early spring before new growth appears. Mulch with weed-free straw around new growth to prevent weeds.
4. As the meadow matures, a periodic weed inspection and annual mowing in late winter or early spring will prevent woody plants from establishing in the meadow site. Maintenance requirements after the second year are the same as described above for the seeded meadow.

Glossary of Terms Used in this Document:

Annual: a plant with a one year life cycle: it grows from seed, blooms, produces seed, and dies within one growing season. Annuals can be classified as summer or winter annuals based on when they germinate and reproduce.
Biennial: a plant that requires two years to complete its life cycle to germinate, bloom, produce seed, and die.
Crown: a plant's crown is where the plant's stems meets the roots.
Dormant Seeding: seeding of desired mixture in late fall or early winter, after ground is frozen or soil temperatures are low enough to prevent seed germination. Seeds germinate in spring when conditions are favorable.
Invasive plant: a non-native plant whose introduction to an ecosystem causes economic or environmental harm to native landscapes.
Nurse crop: A nurse crop is typically a non-competitive, clump-forming grass, incorporated as part of the meadow that helps to reduce weed invasion and reduces soil erosion.
Perennial: a plant with a life cycle that is two or more years. The plant resumes growth each year and continues to grow until it reaches maturity. Perennials typically bloom for one to three weeks of the year. Flowering may not occur until the second year.

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