

SEEDS OF DIVERSITY



Adding Forbs to Warm-Season Grass Plantings

By Dave Williams — Tallgrass Prairie Center

Walking through a robust stand of switchgrass, it's hard to imagine any other native prairie plant being able to establish and persist in such a highly competitive environment. However, research has shown that plant communities with fewer plant species are more susceptible to new plant invasion than species diverse plant communities. Adding forbs into a stand of prairie grasses will result in a more diverse plant community making it more resistant to invading plants. In addition, forbs provide nectar sources for insects, food for pheasant chicks, and game for hunters. At the University of Northern Iowa, we have demonstrated that adding forbs into a stand of prairie grasses is not only possible but can be achieved with only a few steps.

In 1998, 23 forb species were fall seeded into a 25 year-old stand of warm-season grasses. The following summer the site was mowed weekly from May until August. We found that weekly mowing had profound effects on the forbs. Mowed plots had more forb plants, larger roots and shoots, decreased over-winter mortality, and accelerated maturity of the seeded forbs. The best part of the story is that 8 years after seeding, flowering plants have been found for all 23 forb species and they are a very visible component of the plant community.

Here's how to do it.

1. Remove as much duff as possible prior to seeding so seed to soil contact can be enhanced. Duff can be removed by burning or haying.

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2. Dormant seed the forbs. (Nov 01- March 01) Dormant seeding permits seed stratification that improves germination.
3. Use any seeding technique that will ensure seed to soil contact- don't leave seeds on the soil surface.
4. Sow as many species and as much of their seed as you can afford. Keep in mind that only a very small percentage of seed will develop into adult plants.
5. Mow as often as possible. Weekly mowing (2"- 4" height) during the first growing season really weakens the warm-season grasses by moving most of their leaf tissue. Less frequent mowing will give the grasses a chance to re-grow (and recover) shading out the seedlings in need of sunlight. In addition, thatch buildup will result from less frequently mowing and may also be detrimental to the seedlings.
6. If the planting is too large to frequently mow, start small. Use this technique on a small portion of the planting and repeat on other parts in subsequent years.
7. Rotate the burn regime. Repeated spring burning will favor the warm-season grasses and decrease abundance of the cool-season forbs.

For more information on UNI's research project see the March 2007 issue (15:1) of Restoration Ecology or contact Dave Williams at (319) 277-7957.

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Before



After

The Baltimore checkerspot butterfly (*Euphydryas phaeton*)

By Mark Leoschke

Source of its name

The Baltimore checkerspot, a state-threatened insect and the Baltimore oriole, a bird (now known as the northern oriole) both have the same namesake, Lord Baltimore. Lord Baltimore's birth name was George Calvert, and he was a colonial official in Maryland before the Revolutionary War. His family crest had orange and black, just like the butterfly and the bird. Naming a plant or animal after someone is a way to honor them, sometimes as a "thank you" for supporting a scientist or science in general. The Baltimore checkerspot is the state insect of Maryland.

Distribution

The butterfly is found in only 12 counties in the eastern 1/3 of Iowa — Allamakee, Cerro Gordo, Chickasaw, Floyd, Henry, Lee, Linn, Louisa, Mitchell, Muscatine, Winnesiek and Worth. It is near the edge of its range in eastern Iowa, being known from outlying sites in northwest and southeast Nebraska. The butterfly is more common east of Iowa, especially in the northeast United States.

Habitat

Baltimore checkerspots occur in wetlands in northeast/east-central Iowa and openings in upland deciduous forests in far southeast Iowa. The wetlands are usually fens, a groundwater-fed plant community with unusual plants and animals. The Baltimore also infrequently occurs in sedge meadows, another kind of wetland.

Larvae

Eggs are laid in clusters by females on white turtle head (*Chelone glabra*, a member of the figwort family) in northeast and east-central Iowa (in southeast Iowa the females lay eggs on other members of the figwort family) in mid-June to mid-July. Eggs are initially yellow, then turn reddish-brown and hatch after about two weeks.

Larvae are black and orange banded with black, branched spines. They feed communally their first year inside webbing they create from their own silk. The webbing provides some protection from predators and parasitoids such as small, parasitic wasps. Larvae snap their heads back when disturbed to knock off parasitoids and predators, and they have the ability to regurgitate on predators.

In the fall larvae crawl down to the base of their food plant and create more silk webbing in the litter.



They overwinter as larvae, not as chrysalises like many other butterflies. In the spring the larvae eventually separate. They feed on a wide variety of plants before reaching maturity (about 1-inch long) and forming a chrysalis.

Adults

In late May or early June mature larvae transform into a beautiful, white chrysalis with black and orange spots. Adults hatch a few weeks later and have a checkered pattern of black, orange and white on their wings, which are 1.75 to 2.75 inches wide.

The butterflies mate over a period of a few weeks and then die. Males patrol for females and sometimes engage in “fights” with other males, circling high into the sky before separating.

Warning Colors

Combinations of black and yellow, orange or red are warning colors to potential predators. These color combinations say “don’t attack or eat me for I am distasteful and/or poisonous”. Both the larvae and adults have a large amount of black and orange. The larvae ingest a chemical, iridoid glycoside, from their first- year food plant, turtlehead (*Chelone glabra*) that makes both larvae and butterflies become poisonous. The glycoside also stimulates larvae to feed. Whether larvae in southeast Iowa pick up this chemical from eating other members of the figwort family is not known.



Photo courtesy of www.naba.org

Wildlife Management Areas

The Baltimore checkerspot is found on fens in the Red Cedar Wildlife Management Area in Muscatine County in the southeast and the Elk Creek Wildlife Management Area in Worth County in north-central Iowa. Money that hunters have paid for hunting licenses and excise taxes on hunting equipment have helped provide protected habitat for the Baltimore checkerspot as well as public places to hunt.

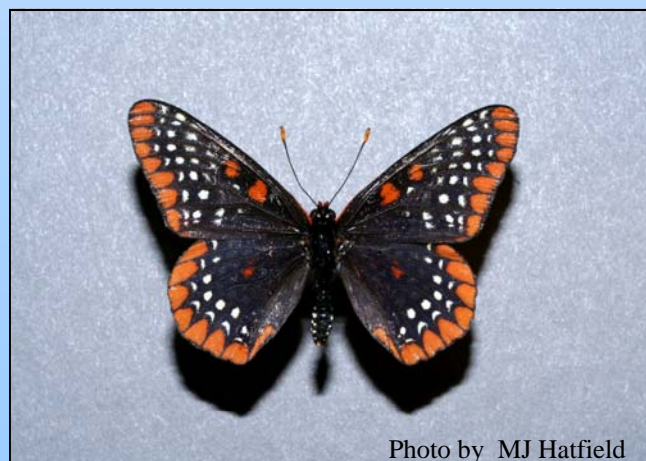


Photo by MJ Hatfield

Solidago rigida— Stiff goldenrod



By William Johnson

Stiff goldenrod (*Solidago rigida*) is a member of the asteraceae family, and it is common throughout Iowa and the Midwest. It produces bright yellow flower clusters in late August to early September in Iowa. Habitat conditions preferred by Stiff goldenrod are dry to mesic sites.

Goldenrods often have a negative connotation when brought up in conversation. Concerns include allergies, and the plant's early dominance in a prairie reconstruction. Often goldenrods are lumped with the weedy prairie species. Stiff goldenrod has many positive characteristics that sometimes are overlooked and are very valuable to a prairie or reconstruction.

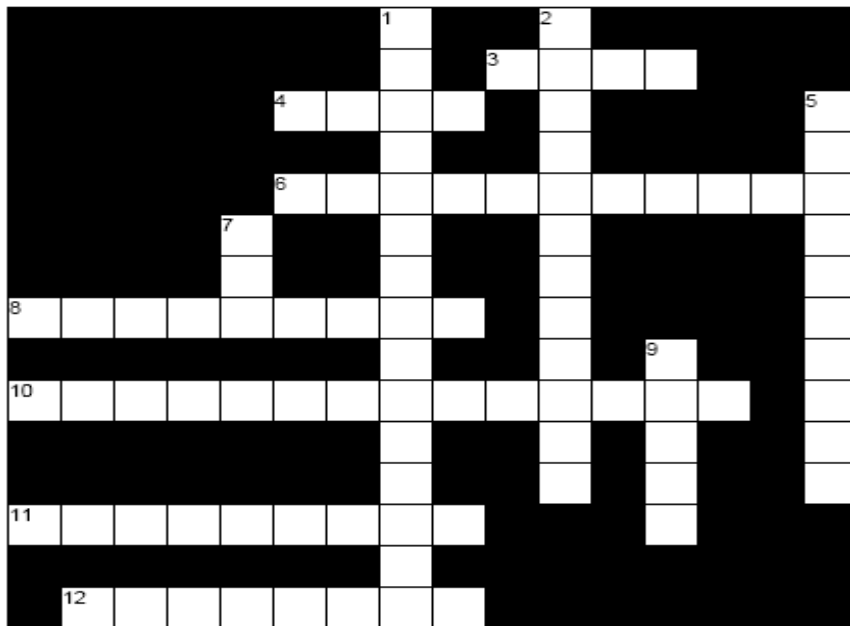
One of the positive characteristics is the plant's early successional nature. A prairie is full of a variety of plants with different characteristics. Some species are prolific seed producers; some have long life spans; and others produce vegetative rhizomes to ensure their future in a prairie. Stiff goldenrod is termed an early successional species because it produces a lot of seed; the seed is very mobile blowing in the wind; and from germination to flower, it takes only two to three years. Why is that positive? Stiff goldenrod will quickly pioneer into disturbed areas on a prairie before noxious weeds are able to establish. The same goes in a reconstruction, because it establishes so quickly, it will compete with any weed species that are also trying to gain a foothold in the area. Seed mobility helps spread seed to disturbed areas beyond the immediate area surrounding the plant. They are the prairies' 82nd Airborne--first in to secure bare soil, but gives way to other perennials as they become established. In other words, stiff goldenrod is quick to dominate, but their dominance wanes after 5-6 years in a reconstruction.

Stiff goldenrod flowers are great attractors of butterflies and other insects--another positive. The late blooming time catches many butterfly species as they migrate south ahead of looming cold weather. Bees can often nectar from goldenrods in the late summer or fall when few other species are blooming. Insects attracted to a prairie or reconstruction offer a wealth of food to many other organisms, as well.

Prairies are sustainable ecosystems because they have a wide variety of plants and animals that help ward off invaders in a variety of ways.

Stiff goldenrod is a keystone species of prairie because it establishes quickly, clearing the way for long-term species to become established; it flowers early in a reconstructive cycle; and pioneers disturbed sites keeping weedy invaders at bay. Stiff goldenrod is a valuable member of the prairie community.

Prairie Jumble



- | Across | | Down | |
|--------|-----------------------------------|------|-------------------------------|
| 3 | remove before seeding | 1 | checkerspot's lay larvae here |
| 4 | seed to _____ contact | 2 | early _____ species |
| 6 | state insect of Maryland | 5 | Goldenrod family |
| 8 | George Calvert nickname | 7 | home of the Panther's |
| 10 | compared to 82nd airborne | 9 | pheasant food |
| 11 | county where checkerspot is found | | |
| 12 | checkerspot habitat | | |