

Native seed for county rights-of-way

Since 1998, Iowa's Integrated Roadside Vegetation Management program has received funds from the Iowa DOT's Transportation Enhancement (TE) program to purchase native seed for county road rights-of-way. Counties may request a Diversity Mix (30-45 species) or a Clean-out Mix (15 to 20 species); both are suited to most roadside situations. The availability of TE mixes means counties purchase directly from commercial seed vendors only when they wish to supplement the TE mixes or when a unique mix is desired for a special project.

Native Seed Categories

Use seed adapted to local climate and growing conditions

Yellow-tag

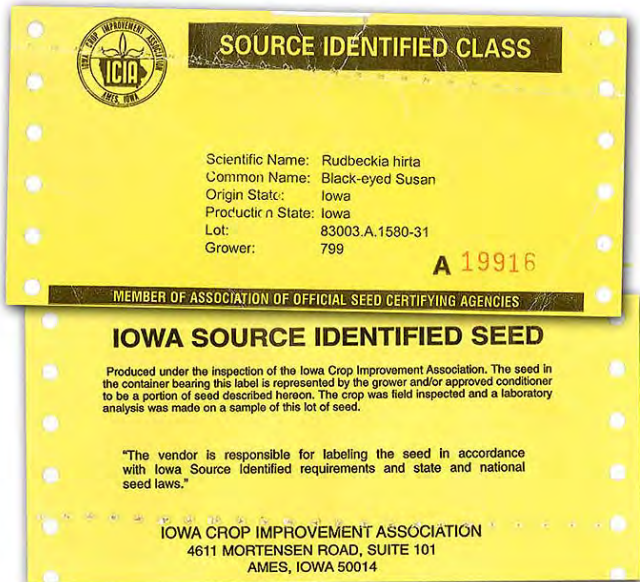
Yellow-tag, source-identified seed is highly recommended for roadside plantings. Because this Iowa seed is certified as to source, the region and climate to which it is adapted are known. This seed is often collected from multiple sites within a region of the state, giving it a broad genetic base and potentially making it adapted to a wider range of growing conditions.

Local ecotype

Non-certified, local ecotype seed of Iowa or nearby origin is also appropriate for roadside plantings and can be obtained from seed vendors by requesting "local ecotype" seed. Some counties establish their own local ecotype prairie grass and wildflower production plots with seed collected from prairie remnants within their county or region. It is important for this seed to be well cleaned and tested so it is known how much live seed is actually being planted.

Cultivars

Cultivars or cultivated varieties are generally not recommended. Cultivars are often derived from sources too far south and west of Iowa and so are adapted to a different climate and growing season. Most were developed for forage production and can be too aggressive in diverse plantings. Cultivars are available in only a limited number of species.



Yellow-tag seed is produced in fields that are inspected and certified annually by the Iowa Crop Improvement Association.

Sources of yellow tag species and related information can be found in the Iowa Crop Improvement Association's [Native Seed Directory](#). Additional native seed sources and information can be found at the Plant Iowa Natives [website](#).



ICIA-certified yellow-tag butterfly milkweed production field.
(Photo courtesy Allendan Seed Co.)

Scientific Name Asclepias tuberosa		Common Name Butterfly Milkweed	
Lot No. ASCTUB460AIA		Test Date 3/5/2010	
Purity	94.33%	Germination	22.00%
Inert	5.65%	Dormant/Hard	67.00%
Other Crop	0.01%	TZ	
Weed	0.01%	Total Viable	89.00%
		PLS	83.95%
Noxious Weeds/Pound	None	Bulk Pounds	0.87
		PLS Pounds	0.73

Seed Labels

Learn to read them

Commercial seed labels contain a variety of information related to quality of the seed. Some or all of the following items will be on the label:

- Pure seed (purity) – Percent of material in the bag that is actually the desired seed.
- Inert matter – Percent plant debris or other materials that are not seed.
- Other crop seeds – Percent non-weed seeds.
- Weed seeds – Percent seeds considered weed species.
- Name and number of noxious weed seeds per pound.
- Germination – Percent of seed that will germinate readily in a germination chamber.
- Hard seed – Percent of seed that does not germinate readily because of a hard seed coat.
- Dormant seed – Percent of seed that does not germinate readily because it requires a pre-treatment or weathering in the soil. (Some suppliers may combine hard and dormant seed on the label.)
- Pounds pure live seed (PLS) – (# PLS) = (# bulk) x (% purity) x (% germination + % dormant).

A “TZ” (tetrazolium) % may also be on the label. Some native species’ seeds will not break dormancy for germination tests. These seeds can be biochemically tested using tetrazolium chloride (TZ). Living tissue is stained red, allowing analysts to determine the viability of non-germinated seed.

Seed stored for more than a year or grown/harvested “in-house” should be tested. The [Iowa State University Seed Testing Laboratory](#) and many private seed testing labs perform TZ tests as well as purity and germ tests, and will identify weed seeds in the sample. TZ test kits are also available.

Seed Storage and Viability

Keep seed cool and dry

The viability of native seed deteriorates rapidly at high temperatures and high humidity.

General rule of thumb for seed storage: ***Temperature plus humidity should not exceed 100.***

- Most seed will last at least a year at 50° Fahrenheit and 50% relative humidity.
- For each 10° increase in temperature, seed longevity is halved.
- For each 1% increase in moisture content of the seed (not RH), longevity is also halved.

Example: Seed stored at 70° and 6% moisture content has only one-quarter the life span of seed stored at 50° and 6% moisture. Likewise, seed stored at 50° and 8% moisture content has only one-quarter the life span of seed stored at 50° and 6% moisture.

“Ideal” seed storage requirements vary with individual species, but most can be stored in a temperature- and humidity-controlled environment for at least a year without losing significant viability. Some IRVM programs have a dedicated seed storage facility. These insulated rooms and small buildings are rodent proof and include air-conditioning units and sometimes industrial dehumidifiers.

In the absence of a seed storage facility, seed should be stored in the coolest place possible. Air circulation can improve conditions in spaces without temperature/humidity controls. Short periods of heat (over 100° F) can be tolerated by most seeds, but long-term exposure can destroy the embryo.

Commercially produced seed has been properly dried before being bagged. Ideally, seed storage bags should be made of breathable materials such as cloth or woven nylon. Well-dried seed (8-14% moisture content, depending on species) – if kept cool and dry – can be bagged and stored in garbage cans, plastic bags or other sealed containers without suffering damage from fungus or freezing. Watch for moisture build up.

Additional information on seed quality, processing and storage is found in *The Tallgrass Prairie Center's Native Seed Production Manual*.



This seed room is “sealed” with tin to keep out rodents and provide a moisture barrier.



A screened enclosure and a mudded, drywall ceiling (left) protect seed from rodents. Window and wall air conditioners and dehumidifiers create climate-controlled conditions (right).

Seed Mixes

Take advantage of prairie diversity

Native roadside seed mixes need to include species adapted to a wide range of growing conditions, from wet to mesic to dry. To outcompete weeds, the mix should also include species that occupy different ecological niches within the planting, grass species and broadleaf species, warm-season and cool-season species, tall plants to shade out thistle seedlings and small plants to fill in underneath.

When working in narrow ditches, such as those found within a 66 ft. right-of-way, it is most efficient to design one mix that includes species for a wide range of site conditions – from the gravelly, well-drained soils at the top of the slope, to the heavy, saturated soils at ditch bottom. Apply the same mix over the entire area and let it sort itself out. Wider rights-of-way may have wet or dry areas large enough to justify designing and planting a seed mix specific to those spots.

To achieve a well-rounded mix with all the benefits native vegetation has to offer, include species from each of the following functional groups. The IRVM office at UNI can help counties design mixes for unique sites or to supplement Transportation Enhancement mixes.

A well-rounded native seed mix will include species from each of these groups:

Quick-establishing

Some native species develop faster than others. These are important for early erosion control and provide positive PR while slower species establish.

- Canada wild rye (*Elymus canadensis*)
- Black-eyed Susan (*Rudbeckia hirta*)
- Rough dropseed (*Sporobolus asper*)
- Partridge pea (*Cassia fasciculata*)



Warm-season grasses

Roadside plantings rely heavily on these prominent members of the native plant community. These grasses continue to grow through the hot summer months. They provide long-term erosion control and good fall color.

- Big bluestem (*Andropogon gerardii*)
- Indiangrass (*Sorghastrum nutans*)
- Switchgrass (*Panicum virgatum*)
- Side-oats grama (*Bouteloua curtipendula*)



Cool-season species

Plantings are strengthened by a species component that greens up early in the spring. These plants provide late-winter/early-spring erosion control and occupy the niche sought by non-native, cool-season competitors like smooth brome.

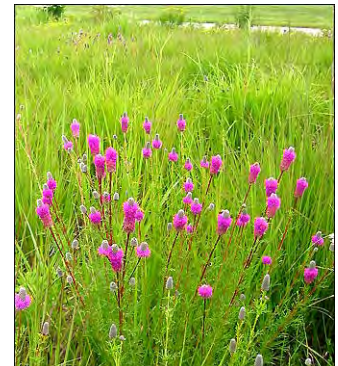
- Canada wild rye (*Elymus canadensis*)
- Virginia wild rye (*Elymus virginicus*)
- Western wheatgrass (*Agropyron smithii*)
- Sedges (*Carex spp.*)



Legumes

The prairie flora includes many legumes that thrive in roadside plantings. They fix nitrogen and improve habitat.

- White wild indigo (*Baptisia leucantha*)
- Round-headed bush clover (*Lespedeza capitata*)
- Showy tick-trefoil (*Desmodium canadense*)
- Canada milk vetch (*Astragalus canadensis*)
- Purple prairie clover (*Dalea purpurea*)



Top to bottom: Partridge pea, Big bluestem, Canada wild rye, Purple prairie clover



Showy and easy

These species establish readily, are relatively inexpensive and create masses of color noticeable at 65 mph. They are crowd pleasers.

- Gray-headed coneflower (*Ratibida pinnata*)
- Ox-eye sunflower (*Heliopsis helianthoides*)
- Wild bergamot (*Monarda fistulosa*)
- New England aster (*Symphyotrichum novae-angliae*)
- Black-eyed susan (*Rudbeckia hirta*)

Showy

The following species cost a little more or are harder to establish but still add important color and habitat.

- Butterfly milkweed (*Asclepias tuberosa*)
- Prairie blazing star (*Liatris pycnostachya*)
- Compass plant (*Silphium laciniatum*)
- Pale purple coneflower (*Echinacea pallida*)
- Stiff goldenrod (*Oligoneuron rigidum*)



Early bloomers

It's relatively easy to extend a planting's blooming season into the fall. Spring color is harder to come by. The following plants provide the earliest color visible from the road.

- Ohio spiderwort (*Tradescantia ohiensis*)
- Foxglove beardtongue (*Penstemon digitalis*)
- Golden alexanders (*Zizia aurea*)
- Large-flowered beardtongue (*Penstemon grandiflora*)



Wet species

Upland species dominate roadside seeding mixes. Species adapted to wet areas are needed for moist ditch bottoms.

- Bluejoint grass (*Calamagrostis canadensis*)
- Swamp milkweed (*Asclepias incarnata*)
- Dark green bulrush (*Scirpus atrovirens*)
- Sneezeweed (*Helenium autumnale*)
- Mountain mint (*Pycnanthemum virginianum*)



Top to bottom: Gray-headed coneflower, Pale purple coneflower, Ohio spiderwort and Swamp milkweed

A note about tall grasses and non-native perennials

For visibility and safety, tall grasses – such as big bluestem and Indiangrass – should not be planted at intersections or driveways. Omitting these grasses throughout the remainder of a planting, however, will limit its adaptability. Big blue and Indiangrass are versatile, adapted to conditions from medium-dry to medium-wet. Short native grasses, on the other hand, are generally adapted only to dry sites.

Non-native perennials – such as tall fescue, perennial rye, crown vetch and birdsfoot trefoil – are very competitive and will persist to the point of adversely effecting survival of native seedlings. These species should not be used in permanent or temporary mixes for sites planted to natives.

Seed mixes for shoulders

Native species are not used on the shoulder. Examples of seed mixes that withstand repeated mowing and are well-suited to shoulder conditions follow.

- 50% Kentucky 31 fescue and 50% perennial rye
- 45% Kentucky 31 fescue, 45% perennial rye, 6% medium red clover and 4% alsike clover
- 35% Fawn fescue, 35% perennial rye, 20% timothy and 10% alfalfa or hairy vetch

Seeding Rates

Put down enough good seed to get timely vegetative cover and ensure planting success

Steeper slopes require heavier seeding rates. To get adequate erosion control, it's more affordable to increase the amount of grass in the mix than to increase forbs. The result is that roadside plantings tend to have a higher grass to forb ratio than other prairie restorations. No matter how much native grass seed is put down, at least a 25% forb component is recommended to achieve adequate diversity and long-term stability. A 50% forb component is considered adequate for a fairly diverse planting. Some counties – especially those with their own forb seed plots – may exceed 50% for intersections and other highly visible plantings.

Seeding rates are calculated in one of two ways:

- Seeds/ft.²
- Lbs./acre

Grass to forb ratio

To get adequate erosion control, it's most affordable to increase the amount of grass in the mix. No matter how much native grass seed is put down, at least a 25% forb component is recommended to achieve adequate diversity and long-term stability. 50% is better.

Though frequently used, lbs./acre is not a precise way of measuring the number of seeds planted since seed weights vary greatly between species. For example, one ounce of compass plant contains 660 seeds, while one ounce of black-eyed Susan contains 92,000 seeds. When accurate calculations are desired, use seeds/ft.

Seeding rates for roadside mixes are determined by slope and – to a lesser degree – seeding method. Budgets can also be a factor. The following chart provides *general* guidelines – a good idea of how many seeds should be put on the ground.

Minimum recommended seeding rates				
	Wildflowers		Native grasses	
Level sites:	2 lb./A or 10 seeds/ft ²	+	7.5 lb./A or 30 seeds/ft ²	
3:1 slopes:	3 lb./A or 15 seeds/ft ²	+	11 lb./A or 45 seeds/ft ²	
2:1 slopes:	4 lb./A or 20 seeds/ft ²	+	15 lb./A or 60 seeds/ft ²	

These rates apply to drill seeding, broadcast seeding and hydroseeding (two-pass method). When hydroseeding with seed mixed in the slurry (one-pass method), increase rates by 15-30% to compensate for seed hung up in the mulch. (Note: Under real working conditions, even the best attempts at measuring seed quantities in the field will not be perfectly precise.)

Sample native seed mixes are provided in Appendix 2a. A calculator for converting weight/A to seeds/ft.² is here:

[Calculating Seeds Per Sq. Ft. \(Excel\)](#)



Diverse roadsides, like this excess right-of-way planting in Cerro Gordo County, are adapted to a wide range of growing conditions and can out-compete weeds.

Comments

Storage and Viability

We've noticed *Liatrix* grows very poorly unless it's dormant seeded shortly after harvest. Perhaps it loses viability or vigor when stored over winter, or maybe it needs to be stored at a higher humidity than most seed. *Jim Uthe, James Devig, Dallas County, 2010*

With a little increase in rate per acre, I think generally year-old seed can be used with no problem. We use older seed (2-3 years) at whatever rate it takes to use it up over the course of the season. I add a reduced rate of new seed to cover any loss of germination. *Linn Reece, Hardin County, 2010*

Seed Mixes

The [LRTF Native Plant Database](#) includes information about each species range within the state of Iowa. This will be helpful for projects in which species native to the specific region are desired.
IRVM Program Office

Keep in mind in most situations we're not recreating a diverse prairie. We're stabilizing the roadside with native plants. *Joe Kooiker, Story County, 2006*

Aspect/shading sometimes need to be taken into account, especially on small plantings or problem areas. In shaded areas, we use savanna species in the mix. If there's a lot of shade, we may plant a non-native, cool-season mix. *Jim Uthe, James Devig, Dallas County, 2010*

On some areas we can afford to plant a diverse mix, but on many areas it's not worth the cost. This is due to disturbances or the fact that the area can't be well-managed because of steep slopes, the inability to burn, invasives, etc. *Joe Kooiker, Story County, 2010*

Remember the forbs that pay the bills ... like yellow coneflower and Monarda. They're colorful, easy-to-grow and cheap. *Joe Kooiker, Story County, 2010*

Depending upon soil type, we may use an additional 1.5 - 2 times the rate of native grass on very steep areas to help speed establishment and stabilization, This will likely have a negative effect on forb diversity once established, but we feel diversity should take a back seat to slope stabilization on slopes 2:1 or greater. *Jim Uthe, James Devig, Dallas County, 2010*

