

## **Out-Competing Roadside Weeds with Native Plants**

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Rural roadsides in every part of the state are predictable nurseries and reservoirs for a broad array of invasive weeds and seeds. Typical roadside management programs, whether sponsored by county road departments or managed by adjacent landowners commonly involve spraying, scraping and/or discing. If county road departments are tasked with doing this, there is typically a significant investment in equipment such as scrapers, the personnel to operate them, and in keeping those personnel busy cycling through the county from one road to the next and back again. This investment in equipment and the personnel to operate it can be a significant barrier to different approaches.

Current water quality improvement requirements throughout the state are forcing a new look at how to manage roadside weeds with reduced chemical input. The Yolo County RCD has more than a decade of experience with managing rural roadsides using California native grasses for multiple benefits. Detailed methods are explained in the RCD publication “Bring Farm Edges Back to Life,” which can be viewed on-line at the above-listed website, publication page 19. Tables below have been excerpted from this publication.

The battle against recurrent roadside weeds is un-winnable, given the current approach. Continuing with current methods promotes replanting of weed seeds and repeating the same measures the following year. It produces herbicide-resistant weeds over time and releases pesticide runoff into regional waterways. Wherever soil is left bare, something will try to grow. A more effective approach involves planting something on those roadsides that is desirable, that will compete effectively with annual weeds, something that will not require extensive annual spraying, discing or scraping and will not be invasive to neighboring areas.

California native perennial grasses are excellent candidates for use in this kind of system and can provide additional benefits beyond weed management. Native perennials are long-lived. Once established individual plants can live ten years or more and can re-seed themselves in the interim. They can provide dense soil coverage, competing with annuals for sunlight and soil nutrients. Their roots are deep – sometimes four to six feet – compared with annual weeds whose roots can be only inches deep, and can assist with greater storm water penetration and reduced runoff. Native grasses can provide habitat for native wildlife and insects that can benefit the neighboring land.

Establishing a native roadside is very similar to planting a new alfalfa field, pasture or lawn and does not require any new tools. Begin in spring by eliminating as many of the existing weeds as possible through a combination of approaches such as repeated discing,

burning, spraying and/or mowing, with a focus on preventing new weed seed from being set. If possible, re-grade the slope of the roadside ditch from that shown in Figure 1 to improve safety and to promote ease of maintenance.



Figure 1

In the fall, after the first good seed-germinating rain, disc under the new weed seedlings. Prepare a fine seedbed and broadcast a native grass seed mix that is designed for your area. Lightly harrow the seed in. Example mixes for different strips are shown in figure 2, below. If there is no roadside ditch, a single seed mix could be used.

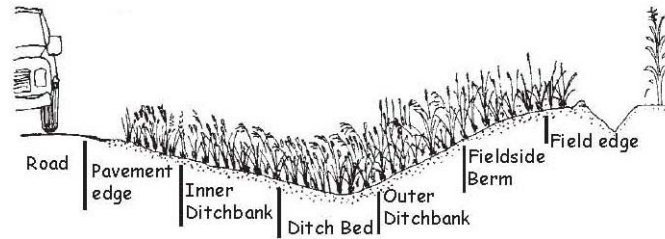


Figure 2

**Pavement edge:** California barley (*Hordeum californicum*), Pine bluegrass (*Poa secunda*), Purple needlegrass (*Nassella pulchra*), Nodding needlegrass (*Nassella cernua*), California oniongrass (*Melica californica*).

**Roadside berm and inner ditchbank:** California barley, California oniongrass, Meadow barley (*Hordeum brachyantherum*), Nodding needlegrass, Pine bluegrass, Purple Needlegrass, and Squirreltail (*Elymus elymoides*).

**Ditch bed:** Meadow barley, Purple needlegrass, and sedges and rushes.

**Outer ditchbank and fieldside berm:**

Deep, Good Soils: Blue wildrye (*Elymus glaucus*), Purple needlegrass, Slender wheatgrass (*Elymus trachycaulus* ssp. *trachycaulus*), California barley, and Deergrass (*Muhlenbergia rigens*).

Poor Soils: Purple needlegrass, Nodding needlegrass, California barley, and Pine bluegrass.

**Field edge:** Creeping wildrye (*Leymus triticoides*).

Native roadsides need attention to maintenance during the first two to three years, just as if you were managing a crop. Thereafter, maintenance should be minimal. The most important maintenance measure is reduction of weed competition while the perennials are getting established. During the first year or two perennials develop a deep root system rather than top-growth, so reducing early competition for sunlight is critical to their survival.

The following three tables provide guidelines and costs for successfully establishing native grasses along a rural roadside. Once the grasses are well established and broadleaf weeds have been reduced to a minimum, native wildflower seed can be scattered among the grasses to enhance the roadside's appearance and diversity. It is advised to consult someone who has had experience with native grass establishment to ensure success. Although initial costs may be high, the pro-rated costs over ten years or more, coupled with the associated improvements in water quality, reduction of pesticide applications, appearance improvement, and wildlife habitat make the benefits clear. Cost-share options are available through the USDA Natural Resources Conservation Service, conservation organizations and local RCD's.

### Native Grass Establishment Schedule

#### **Year 1**

<b>Month</b>	<b>Project</b>	<b>Description</b>
March-September	Prepare Seed Bed	<ul style="list-style-type: none"> <li>• disking in spring and/or burning in fall removes weeds and prepares the soil for planting</li> </ul>
September-March	Seeding & First Weed Control	<ul style="list-style-type: none"> <li>• drill or broadcast and harrow seed</li> <li>• spray glyphosphate on 1st flush of weeds before native grasses emerge</li> </ul>
February-March	Broadleaf Weed Control	<ul style="list-style-type: none"> <li>• spray phenoxy herbicides to eliminate broadleaf weeds in planted area</li> </ul>
March-June	Late Grass Weed Control	<ul style="list-style-type: none"> <li>• mow, hay, or lightly graze planted area to remove annual grasses before they go to seed</li> </ul>

#### **Year 2**

October-December	Fall Weed Control	<ul style="list-style-type: none"> <li>• pre-emergent herbicides (consult Ag Extension) or a broadleaf herbicide after weed emergence</li> </ul>
April-June	Spring Weed Control	<ul style="list-style-type: none"> <li>• broad-leaf herbicides, mowing, burning, or grazing can be used, depending on the weeds that are present</li> </ul>

#### **Year 3 and Beyond**

October-November	Fall Weed Control	<ul style="list-style-type: none"> <li>• pre-emergent herbicide or burning</li> </ul>
April-July	Spring or Summer Management of Grasses	<ul style="list-style-type: none"> <li>• mowing, burning, or grazing (grass lands are healthiest when these management practices are alternated from year to year)</li> </ul>

**Native Grass Establishment Program Checklist**  
(reproduce for project reference)

Project/Location \_\_\_\_\_ Date \_\_\_\_\_

- Choose a site that will not be awkward to protect and that can be accessed with equipment for maintenance
- Minimize weed generation and seed production on proposed site for at least one year
- Order seed (see vendor list)

**Year 1 (Summer/1st Fall-2nd Fall)**

- Prepare seed bed by disking in spring and/or burning in fall
- Kill first flush of fall weeds after early rains
- Drill or broadcast seed (preferably before December, but sometimes OK as late as March)
- Spray out weed seedlings that germinate within two weeks of seeding
- In mid-to-late winter, spray phenoxy herbicides to eliminate broadleaf weeds in planted area (use only herbicides such as MCPA that won't burn perennial grass seedlings)
- In spring, mow, hay, or lightly graze planted area to remove annual grasses before they produce viable seed (in a wet spring, this may need to be repeated)
- Late-spring/summer weed control by hoeing, mowing, or with chemicals (as needed)

**Year 2 (2nd Fall-3rd Fall)**

- (Optional) Apply pre-emergent herbicides (consult Ag Extension) or a broadleaf herbicide after weed emergence in fall
- In late winter, spot spray phenoxy herbicides or hoe to eliminate broadleaf weeds in planted area
- Mow, hay, or lightly graze planted area to remove annual grasses before they produce viable seed (in a wet spring, this may need to be repeated)
- Late-spring/summer weed control by hoeing or with chemicals (as needed)
- (Optional) Late spring/summer/fall burn to reduce weed seed production and thatch; timing depends on the available fuel (dry matter to carry a fire) and type of weeds present

**Year 3 and Beyond**

- Fall weed control with pre-emergent herbicide or fire
- Selective hoeing and spot spraying for winter broadleaf and grass weeds
- Spring mowing, burning, or grazing (grasslands are healthiest when these management practices are alternated from year-to-year)
- Selective hoeing and spot spraying for summer broadleaf and grass weeds

**Grassed Roadside Installation and Maintenance Cost Estimate (1999)**

For one mile of roadside, 15 feet wide (approx. 1.8 acres)

	<u>Cost/hr.</u>		<u>Time</u>		<u>Total Cost</u>	
	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>	<u>Low</u>	<u>High</u>
	<u>Range</u>	<u>Range</u>	<u>Range</u>	<u>Range</u>	<u>Range</u>	<u>Range</u>
<b>Installation</b>						
Earthwork*	\$70.00	\$70.00	2	8 hrs.	\$140.00	\$560.00
Bed preparation	50.00	50.00	2	4 hrs.	100.00	200.00
Pre-plant Herbicide		60.00	0	0.5 gal.	30.00	
Labor		10.00	0	2 hrs.		20.00
Spray rig		25.00	0	2 hrs.		50.00
Seeding:						
20-40 lbs./acre for 1.8 ac.	10.00	35.00	36	72 lbs.	360.00	2,520.00
Broadcast/Harrowing Seed	35.00	35.00	2	8 hrs.	70.00	280.00
<b>Total Installation Cost</b>					<b>\$670.00</b>	<b>\$3,660.00</b>
<b>Maintenance Costs (first three years):</b>						
Mowing	40.00	40.00	2	2 hrs.	80.00	80.00
Spot spray broadleaf weeds	10.00	10.00	1	3 hrs.	10.00	30.00
Herbicide	22.00	60.00	0.125	0.25 gal.	2.75	15.00
Second mowing		40.00	0	2 hrs.		80.00
Controlled Burn (once in 3 yrs)		10.00	0	7 hrs.		70.00
<b>Annual Cost</b>					<b>\$92.75</b>	<b>\$275.00</b>
<b>Perpetual Costs:**</b>						
Mowing	40.00	40.00	2	4 hrs.	80.00	160.00
Spot spraying		10.00	0	4 hrs.		40.00
Herbicide		60.00	0	0.25 gal.		15.00
Controlled burn (ea. 2nd yr. max.)	10.00		0	10 hrs.		100.00
<b>Annual Cost</b>					<b>\$80.00</b>	<b>\$315.00</b>
<b>Average annual maintenance cost over 10 years</b>					<b>\$83.83</b>	<b>\$303.00</b>

For comparison, standard roadside management in Yolo County (a combination of “blading,” spraying, and/or mowing) costs between \$140 and \$490 per year depending on the roadside and management system. This does not include the secondary weed control costs to landowners or downstream water quality problems.

\* Depending on your roadside’s existing configuration, there may be minimal or extensive re-grading required. This grading estimate assumes work done by a county roadside blade operator (in which case, the cost is theirs).

\*\* The degree of long-term maintenance can depend on the individual landowner’s tolerance for *some* weeds or no weeds