Selected Irrigation Canal Vegetation for Seasonal Summer Systems

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Working irrigation canal banks provide an excellent setting for perennial native plants to support a rich, biodiverse system with multiple benefits. Surveys of undamaged banks on vegetated western streams provide living models that healthy irrigation banks decrease erosion and water problems while functioning as efficient water transport systems. The goals of native bank vegetation systems include the following: suppress weed invasion and thus reduce herbicide use; minimize soil erosion, thus reducing maintenance; support water quality as vegetation filters excess nutrients; and simultaneously enhance biological diversity and aesthetics.

If possible, the slope to be planted should be regraded to no steeper than a 3:1 slope to ease planting and maintenance. If the bank can be seeded, the seed bed should be prepared with a harrow or disk prior to planting. A typical canal bank planting involves seeding in the dry zone and upper high moist soil zones and coming in later with plugs to plant the water line and low, moist soil zones.

Weed control is especially challenging on canal banks with constant summer moisture and a regular influx of weed seed from upstream. At least one prior year of complete weed suppression (no seed produced) is recommended before planting a site, and vigilant weed suppression during the first year after planting is crucial for successful establishment.

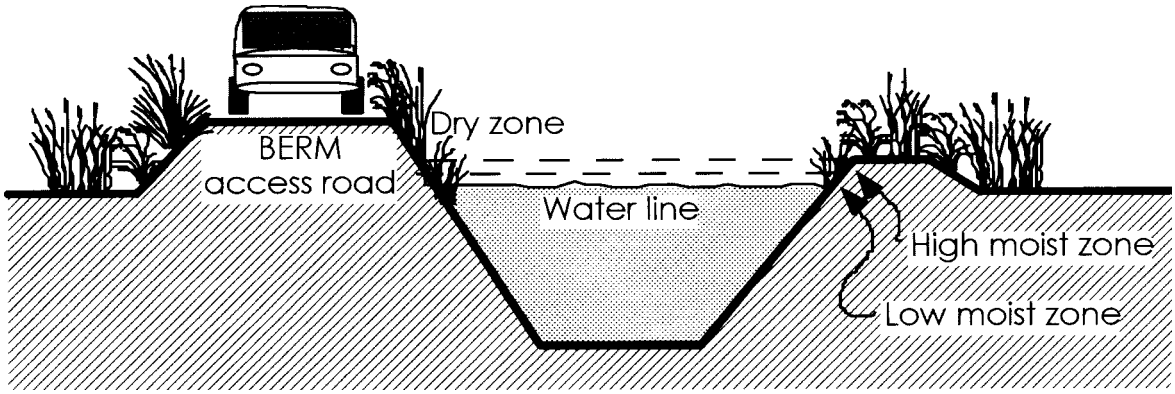
Image by Christopher Rose

Low-statured native plants add beauty and stability to a Yolo County canal

The list below of recommended plants is intended for consideration and choice, not solve all problems: the idea is to initiate innovation and experimentation on specific sites. In fact, there are plant characteristics not included here that may well bear on plant choice: for example, dormancy, soil preference, height or vegetation volume (biomass), root structure, herbicide tolerance, etc. It is important to note that we have had particular success with Creeping wildrye in many canal bank situations. Its tolerance of summer moisture and its rhizomatous growth form provide very effective competition with and suppression of typical weeds.

Four distinct zones have been defined to delineate the planting scheme, as illustrated on the following page.

Canal planting zones



Water Line Zone

This zone is submerged or very wet much of the time during the irrigation season. Here, Cattails (*Typha* spp.) will try to grow in unmanaged systems. Recent experimentation with Baltic rush offer encouraging results since they withstand fluctuating water levels and go dormant in dry, dewatered conditions. Though Baltic rush forms a dense mat of weed suppressing vegetation, its small vertical growing stems do not significantly obstruct water flow.

Common name	Scientific name	Planting method
Common spikerush	*Eleocharis macrostachya*	Transplants
Alkali bulrush	*Scirpus americanus*	Transplants/Seed
Baltic rush	*Juncus balticus*	Transplants
Three-square bulrush	*Scirpus americanus*	Transplants

Notes:

- Other species of *Eleocharis* should also be considered.
- In fluctuating water systems, creeping species may inhabit up to three zones depending on the water level.

Low, Moist Soil Zone

This zone is moist during the irrigation season and would be typical of a wet meadow or perennial stream dry edge. Left unmanaged, this zone becomes inundated with Watergrass, Barnyardgrass, Sprangle top, Jointgrass, nut sedge and other undesirable weeds. Spike rush would extend into this zone.

Common name	Scientific name	Planting method
Bent grass	*Agrostis exarata*	Seed
Tufted hairgrass	*Deschampsia caespitosa*	Seed
Baltic rush	Juncus balticus	Transplants
Flatbladed Rush	*Juncus xiphioides*	Transplants
Alkali bulrush	*Scirpus americanus*	Transplants/Seed
Three-square bulrush	*Scirpus americanus*	Transplants
Clustered field sedge	*Carex praegracilis*	Transplants
Yerba manza	*Anemopsis californica*	Transplants

High, Moist Soil Zone

Similar to the low zone, but drier, this zone accommodates the following:

Common name	Scientific name	Planting method
Baltic rush	*Juncus balticus*	Transplants
Barbar's sedge	*Carex barbarae*	Transplants
Clustered field sedge	*Carex praegracilis*	Transplants
Molate fescue	*Festuca rubra var. molate*	Seed
Creeping wildrye	*Leymus triticoides*	Seed/Transplants
Alkali sacaton	*Sporobolus airoides*	Seed
Deergrass	*Muhlenbergia rigens*	Transplants
Salt grass	*Distichlis spicata*	Rhizomes

Dry Zone

This zone is dry during the summer. The deep rooted plants in this zone will frequently have access to summer water from the canal especially on better soils and low berms.

Common name	Scientific name	Planting method
Salt grass	*Distichlis spicata*	Transplants
Creeping wildrye	*Leymus triticoides*	Seed/Transplants
Purple needlegrass	*Nassella pulchra*	Seed
Nodding needlegrass	*Nassella cernua*	Seed
Blue wildrye	*Elymus glaucus*	Seed
Yolo slender wheatgrass	*Elymus trachycaulus majus*	Seed
California brome	*Bromus carinatus*	Seed
California barley	*Hordeum californicum*	Seed
Meadow barley	*Hordeum brachyantherum*	Seed
Three-awn	*Aristida hamulosa*	Seed
Pine bluegrass	*Poa secunda*	Seed
Idaho fescue	*Festuca idahoensis*	Seed
California oniongrass	*Melica californica*	Seed

Typical Costs for Vegetating Canal Banks (1999)

for one mile of canal, both sides (approx. 1.7 ac.)

Task	Cost/Unit in $		Units		Total Cost in $	
	Low	High	Low	High	Low	High
Installation Costs						
Sloping edges back	70.00	70.00	5	10 hours	350.00	700.00
Fall Seeding:						
Seed @ 25 lb./ac. over 1.7 ac.	15.00	30.00	34	42.5 pounds	510.00	1,275.00
Bed preparation (Tractor /harrow)	30.00	30.00	4	8 hours	120.00	240.00
Broadcast seed ("Bellygrinder")	10.00	10.00	2	4 hours	20.00	40.00
Harrowing in	25.00	35.00	1	2 hour	25.00	70.00
Winter/Spring planting:						
Spikerush/Sedge (1-2 pl./2')	0.20	0.40	5280	10560 plugs	1,056.00	4,224.00
Planting labor (@ 100 pl./hr.)	10.00	10.00	53	106 hours	530.00	1,060.00
Weed control:						
Fall Rodeo pre-seeding (10 oz./ac.)	150.00	150.00	0.31	0.31 gallon	46.50	46.50
Labor	25.00	25.00	1	1 hour	25.00	25.00
Spring Rodeo	140.00	140.00	.017	.0675 gallon	2.38	9.45
(spot treat after canal full)						
Labor	10.00	10.00	1	4 hours	10.00	40.00
Broadleaf spray before plugging	10.00	10.00	0	1.7 acres		17.00
Total Installation Costs					**$2,694.88**	**$7,746.95**
Annual Maintenance Costs						
Spot-spray w/ Rodeo (1-2X)	25.00	25.00	2	16 hours	50.00	400.00
Rodeo material	140.00	140.00	.035	.25 gallon	4.90	35.00
Mowing	25.00	25.00	3.5	3.5 hours	87.50	87.50
and/or Burning (5 people x 2 hours)	10.00	10.00	0	10 hours		100.00
and/or Hoeing crew (2-8 hrs, 0-2X)	10.00	10.00	0	16 hours		160.00
and Willow cleaning (1/3 yrs.)	50.00	50.00	0	0.6 acres		30.00
and Slump repair	200.00	500.00	0	2 slumps		1,000.00
Total Annual Maintenance Costs					**$142.40**	**$1.812.50**
Total Cost over 10 Years Including Maintenance					**$4,118.88**	**$25,871.95**
Average Annual Cost over 10 years					**$411.89**	**$2,587.20**