

Seeding Recommendations for Horse Facilities in the San Francisco Bay Area

CONSERVATION MEASURES

You have evaluated your horse facility and come to the conclusion that excessive soil erosion is coming from a **pasture** or high-use area (**critical area**), such as paddocks, turn-out areas, roads, or a parking lot. Perhaps you need to convey water around a barn through a **grassed waterway**. Or maybe rainwater runs through a manured area, and you want to use a **filter strip** to reduce contaminants in the polluted water. The vegetation planted for all of these conservation practices will reduce soil erosion, increase infiltration, percolation, and ground water recharge.

These seeding recommendation mixtures are for general dryland (non-irrigated) purposes. Specific recommendations will vary based on site evaluation that would take into account rainfall, length of growing season, soils, etc. Since the San Francisco Bay Area has many micro-climates, your local USDA Natural Resources Conservation Service, UC Cooperative Extension Farm Advisor, or local seed supplier can help with specific suggestions. Different grass species are suitable for different purposes. Perennial grasses are deeper rooted and certain species are sod-forming (rather than bunchgrasses), which protects the soil from excessive erosion. Annual grasses provide a quick cover and reseed themselves each year.

Filter Strip

A filter strip is designed to treat runoff situated between high-use areas and environmentally sensitive areas, such as a creek, swale, or pond. The filter strip will reduce sediment, sediment adsorbed contaminant loadings in runoff, dissolved contaminant loading in runoff. Also a filter strip will restore, create or enhance habitat for wildlife and beneficial insects.

A filter strip must be designed so overland flow (runoff) entering the filter strip must be primarily sheet flow. Concentrated flow must be dispersed into sheet flow, before entering the filter strip. The minimum width is 20' to reduce sediment. Additionally, to reduce dissolved contaminants in runoff, the minimum width is 30'. Local site criteria may require filter strip widths of up to 100'.

Grassed Waterway

Imagine a gentle ditch, fully clothed in grass, with side slopes that are relatively flat. This simple design is a grassed waterway which is a designed channel that is mechanically shaped or graded with a dozer, and seeded with grass for the stable conveyance of runoff. The grassed waterway will convey runoff without causing erosion or flooding. As with all engineered conveyances, the grassed waterway must be designed to withstand the velocity of water anticipated, and must be assessed to see if the waterway needs to be lined for higher water velocities with erosion control matting, rock or concrete. Grassed waterways perform most dependably in areas

where dense stands of sod forming grass will permit anticipated water velocities.

The most critical time in successfully installing a grassed waterway is when vegetation is being established. Special protection such as mulch are warranted at this critical period. Supplemental irrigation is optimal. The vegetation should be well established before large flows are permitted in the channel.

Critical Area

Critical erosion areas such as road cuts and fills, road beds, and gullied areas need to be stabilized to reduce damage from runoff. Critical area seeding is used where vegetation is difficult to establish.

Plants should have the ability to provide adequate ground cover, canopy cover and root mass for erosion protection. High seeding rates are needed to insure adequate vegetative cover because these sites have been severely eroded or disturbed and have low fertility and few resident seeds.

Pasture

It is time to reseed a pasture when horses excessively use one area of pasture, or selectively graze desirable plants and leave the less desired plants. Nearly all pastures have areas where horses concentrate such as around water and feed areas. Under continuous use, these are always overgrazed.

SEEDING RECOMMENDATIONS

Note: Species in bold are native to California

Seed Mixture	Plant Characteristics	Lbs/Acre	Filter Strip	Grassed Waterway	Critical Area	Pasture
1. Berber orchardgrass ¹	Perennial grass	16	X	X		
2. Creeping wildrye ^{1,2}	Perennial grass	30 ³	X	X		
3. 'Blando' brome	Annual grass	18	X	X	X	
'Zorro' annual fescue	Annual grass	10				
Rose clover ⁴	Annual legume	9				
California poppy ⁵	Annual wildflower	1				
Arroyo lupine ^{5,6}	Annual wildflower	1				
Crimson clover ⁴	Annual legume	1				
4. California brome ¹	Perennial grass	25	X		X	
Blue wildrye ¹	Perennial grass	18				
California poppy ⁵	Annual wildflower	1				
Arroyo lupine ^{5,6}	Annual wildflower	1				
5. Blando brome	Annual grass	25			X	
Annual ryegrass	Annual grass	24				
6. 'Berber' orchardgrass ¹	Perennial grass	4				X
Tetraploid perennial ryegrass ¹	Perennial grass	6				
Subclover ^{4,7}	Annual legume	6				
Rose clover ⁴	Annual legume	4				
7. 'Blando' brome	Annual grass	6				X
Rose clover ⁴	Annual legume	6				
Subclover ^{4,7}	Annual legume	6				

¹ Mulch must be used to provide initial erosion control when establishing perennials.

² Also known as beardless wildrye.

³ Or use 1' x 1' plugs.

⁴ Also see "legume inoculation" section below.

⁵ Optional, use for color.

⁶ *Lupinus succulentus*, also known as hollowleaf annual lupine.

⁷ Use locally adapted varieties recommended by UC Cooperative Extension.

INSTALLATION CRITERIA

Timing: Plant before the rainy season, October 15 of the year.

Seeding rate: Seeding rates are for 100% Pure Live Seed (PLS), and are broadcast (by hand or broadcast seeder) rates. Seed bag "tags" tell the percent purity for PLS and germination rate. If seed bag tag states less than 100% PLS, increase the amount of seed in proportion to the percentage needed (germination x purity). Time since the date of seed test on the tag should not exceed 9 months.

Seedbed preparation: The area to be planted must be weed free and have a firm seedbed which has been previously roughened by disking, harrowing, or otherwise worked to a depth of 2 to 4 inches, except

when planting no-till. No implement should be used that would create an excessive amount of downward movement of clods on sloping areas. Weeds and other debris that would interfere with seeding or maintenance should be removed.

Legume Inoculation: All legumes (clovers) should be "inoculated" before planting with a pure culture of nitrogen-fixing bacteria and prepared specifically for that plant species. This is done immediately prior to planting. The seeding rate does not include the weight of inoculant or seed coating.

Why: All legumes, including clover, have the ability (in cooperation with legume bacteria) to draw nitrogen from the air and store it in the small nodules that form on the

continued on next page...

roots. Studies have shown an increase in legume production and nitrogen fixation when seed is properly inoculated. On poorer soils, the clover seed may be a complete failure if not properly inoculated. The bacteria is helpful to young plants as roots begin to develop, increasing their chance to grow successfully.

How: Put seed on canvas, in tub or other container. Mix the inoculating culture with the seed and stir until the seed is well covered. Mix with grass seed selected. Prevent from drying out by sun or wind. Plant immediately.

Mulch: A straw mulch cover should be uniformly distributed over the seeded area within 48 hours following the seeding. Straw mulch should be applied at a rate of two tons per acre (or one 74 pound bale per 800 square feet, at a uniform depth of 2 to 3 inches). Straw is the preferred mulch and needs to be anchored in place. Hand punching with a shovel or a square-end spade can work for small areas, whereby straw stands perpendicular to the slope and is embedded at least 4 inches into the slope, and punched about 12 inches apart. For larger areas, anchoring with rollers, crimpers, or disks can be use on slopes up to 3-to-1.

Use of rice straw will minimize weed seeds, since the type of weeds that grow in the aquatic environment with rice will not survive on dry land sites. Use of wheat straw will result in less volunteer grain compared to barley straw. When using straw grown in the same county, use clean straw to minimize the spread of noxious weeds. Bales of native grass with seed is also a good option.

Irrigation: A sprinkler system is optimal for establishment and water should be applied during the establishment period. Maintain adequate moisture in the upper six inches of soil during the first four weeks, and then in the upper 12 inches thereafter until the rainy season.

Maintenance: Mowing should be performed for control of noxious weeds or for a firebreak. Periodic mowing can be performed to reduce rank growth and maintain desired species populations. Herbicides should only be used to control noxious species.

Limit traffic and do not use as a roadway. Limit livestock use. For filter strips and grassed waterways, eradicate or remove all burrowing rodents and immediately repair any damage caused by their activity.

Council of Bay Area Resource Conservation Districts

in partnership with

USDA Natural Resources Conservation Service

1301 Redwood Way, Ste 215
Petaluma CA 94954
(707) 794-1242, ext 121

Participating Resource Conservation Districts (RCD):

Alameda Co. RCD
(925) 371-0154
Contra Costa RCD
(925) 672-6522, ext 3
Marin Co. RCD
(415) 663-1170
San Mateo Co. RCD
(650) 726-4660
So. Sonoma Co. RCD
(707) 794-1242, ext 5

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.