

MONTANA SALINITY CONTROL ASSOCIATION

Recommended Salt-Tolerant Forage Species

Salinity Tolerance In Order From High To Low

Soil EC (mmhos/cm)

Guidelines For Establishment*

Species	Variety	Soil EC (mmhos/cm) MARGINAL Establishment Level	Limitations	Adaptation Characteristics
Beardless Wildrye (<i>Leymus multicaulis</i>)	Shoshone	24	High seed dormancy (fall dormant planting required). Slow seedling development and expensive so use with caution.	Good wildlife cover; spreads by rhizomes into more severe saline sites; productive & palatable to all livestock.
Tall Wheatgrass (<i>Thinopyron ponticum</i>)	Jose, Alkar Largo, Orbit	22	Very competitive in mixtures; unpalatable in mature stages (after heading). Don't use with AC Saltlander - use one or the other. DO NOT CUT TOO SHORT/CLOSE TO GROWING POINT	Adapted to high water table AND well drained sites. Good wildlife cover. Good for snow management. Very productive if properly managed. To improve grazing, mow standing dead straw in Spring occasionally, but not too low, then livestock accesses new growth.
Green Wheatgrass (<i>Elymus hoffmannii</i>)	AC Saltlander	22	Natural hybrid, seeds hard to distinguish from quackgrass. Drought tolerance similar to intermediate wheatgrass. Sold separately or in 2-way coated blend with endophyte-free tall fescue ESTABLISHES BEST WITH TILLED SEEDBED	Equal salt tolerance to tall wheatgrass, but better palatability. Spreading rhizomes can displace foxtail barley over time. Developed by Agriculture Canada (Swift Current). Better forage choice than NewHy. Requires prepared, tilled seedbed.
Hybrid Wheatgrass (<i>Elytrigia repens</i> X <i>Pseudoroegneria spicata</i>)	Newhy	22	Some seed dormancy-may require fall planting. Needs 14" annual rainfall or an elevated water table.	Highly palatable in growing season prior to frost; less palatable with maturity, slightly rhizomatous. Easier to manage than tall wheatgrass.
Altai Wildrye (<i>Leymus angustus</i>)	Prairieland Pearl, Eejay	20	Low seed yield; poor seedling vigor and competition with weeds and grasses early in life cycle.	Utilizes deep water tables; Loam and clay-loam soils; competes better with weeds once established.
Slender Wheatgrass (<i>Elymus trachycaulus</i>)	Pryor	20	Intolerant of prolonged flooding; short-lived. Moderately competitive with other grasses. Limit seeding rate in mixtures to 2 lb/ac PLS. Less palatable with maturity.	Adapts to wide range of soils (sandy loams preferred); excellent emergence and seedling vigor; good cover. Include as quick cover in mixtures.
Russian Wildrye (<i>Psathyrostachys juncea</i>)	Bozoisky- Select Bozoisky II	16	Needs to be seeded alone, with row spacing of 18 inches or greater. Not flood tolerant. Adapted to upland dry saline sites.	Loams and clay loams; high digestibility and retains nutrient value into fall and winter. Competes well with weeds. Tolerant of cold and drought.
Tall Fescue (<i>Festuca arundinacea</i>)	Fawn Bridgestone Johnstone	14	Less compatible in a mixture. Good winter hardiness. Choose forage varieties that are endophyte-free to prevent fescue foot.	Wide range of soils and climates; deep rooting; ideal waterway cover; tolerates poorly drained conditions.
Western Wheatgrass (<i>Pascopyrum smithii</i>)	Rosana Rodan	14	Some seed dormancy-fall or early spring planting recommended.	Drought and flood resistant; good for erosion control; winter hardy; prefers heavy clay soils.
Pubescent Wheatgrass (<i>Thinopyrum intermedium</i>)	Greenleaf, Manska, Mandan 759	12	Greenleaf developed at Lethbridge, Alberta research center; easily established with fair saline tolerance. Pubescence is on the seed, not the leaf.	Mildly sod-forming, similar in growth to intermediate but somewhat better salt-tolerance and better drought tolerance. Stays green into summer with adequate soil moisture. Mixes well with alfalfa for hay or pasture.

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Intermediate Wheatgrass (<i>Thinopyrum intermedium</i>)	Oahe	12	Early season growth and matures 2 weeks later than crested, will resume growth with late season moisture. Works well with alfalfa since maturity is the same for quality hay.	Sod-former, good drought tolerance but less than crested.
	Greenar			
	Rush			
Barley (Hay) (<i>Hordeum spp.</i>)	Lavina	12	Grain yield will be reduced in saline conditions; cut early for hay.	Highest salt tolerance of small grain species; choose hay variety or drought-tolerant grain variety.
	Haymaker			
	Stockford			
Hybrid Crested Whtg <i>Agropyron cristatum x desertorum</i>)	Hycrest	10	Tolerates only small periods of flood; cannot tolerate high water tables. Adapted to upland dry saline sites.	Good seedling vigor and drought tolerance; well drained loams; good for erosion control & early spring pasture.
	Hycrest II			
Creeping Foxtail (<i>Alopecurus arundinaceus</i>)	Garrison	8	Unable to tolerate drought; fluffy seed is difficult to plant, so use coated seed or mix in small batches so seed doesn't settle out.	Needs high water table ; spreads by rhizomes into saline conditions; withstands flood events. More salt tolerant as mature plant, less tolerant as seedling.
Yellow Sweetclover (<i>Mellilotus spp.</i>)	Commercial	8	Only a biennial plant; limited salt-tolerance. Competitive in mixtures.	Adapted to wide range of soils and climates; excellent seed producer; soil-improving.
Alfalfa (<i>Medicago sativa</i>)	Ladak 65	6	Not as salt-tolerant as most grasses. Seedling has lower salt tolerance than mature plant. Ladak 65 is very drought tolerant with bacterial wilt resistance, tap-rooted. Most dryland varieties have one-cutting. Travois and Rambler are falcata type or fibrous rooted, very drought tolerant, yellow flower, lower growing, persistent in grazing, new plants form from roots..	Choose variety that is drought tolerant and long lived, since area may not be disturbed for long period. Deep rooting varieties like Ladak 65 will help dry out the deep soil profile in recharge areas. Fibrous rooted or spreading varieties may last longer in elevated water table situations.
	Spredor III			
	Cooper			
	Travois			
	Rambler			

AFX 457, Rugged, Magnum Salt, Nimbus, RR Saltiva - all with *improved salt-tolerance over most other alfalfa varieties*;

Salinity tolerance level being tested in Montana conditions. Rugged has winter-hardiness and grazing tolerance. PGI 427 disease resistance & grazing/traffic tolerance.

AFX 457 probably most tolerant in Montana conditions. RR Saltiva (Roundup Ready, Fall dormancy 4) not tested in MT but does well in adjoining states.

*Soil in Montana's saline seeps contain **neutral** soluble salts, primarily dissolved sodium, calcium, magnesium, sulfate and nitrate. Amendments generally not required. Soil salinity is measured by Electrical Conductivity (EC) with the units of millimhos per centimeter (mmhos/cm) or milliSiemens/cm (mS/cm) or deciSiemens per meter (dS/m). The units are interchangeable. Saline soil is defined as an EC greater than 4 mmhos/cm. The pH-usually 6.5-8.5. Test the soil in the 0-6 inch layer where the seed will be placed. EC will vary seasonally and with age of the seep and depth to ground water. **Do not apply gypsum as an amendment** since it contains same salts as present in Montana saline seeps. **DO NOT USE products claiming to improve saline conditions by changing the pH.** Salt level is the problem, not the pH as general rule in Montana. Need to lower high water table. Montana saline seep soils have sulfate-based salts, different from chloride-based salts associated with deep-brine water and other states' saline problems.

MONTANA SALINITY CONTROL ASSOCIATION FACT SHEET

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Reviewed March 2018 by David Wichman/retired MAES forage researcher and Dr. Emily Mccage/MSU Extension Forage; Larry Holzworth, retired Plant Materials Specialist in 2016

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