



Grow BETTER PASTURES

Improved pastures can be profitable when you grow the right grasses and legumes, and follow sound pasture production practices. Good grazing can reduce your livestock production costs. There is also opportunity for cash income with grass and legume seed crops.

This circular outlines pasture practices recommended by NDAC Experiment Station to help you increase your pasture income.

SEEDING SUGGESTIONS

Seed grasses, alfalfa and clover as early as possible on a clean, firm, moist seedbed with good fertility and physical condition. A field you would consider suitable for seeding flax is usually good for seeding grasses or legumes.

Use of flax as a companion crop is recommended. Flax competes the least with the small grass and legume plants. Sweetclover may get

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so tall as to cause difficulty in harvesting flax in very favorable years. Although this is not a common situation, some farmers may prefer to use oats as the companion crop for sweetclover.

Grasses and legumes sometimes are seeded without a companion crop in North Dakota under very dry conditions. However, a crop year is lost and weeds may compete with legumes and grasses, resulting in no better stand than if a companion crop had been used. Short-strawed, early oats, wheat or barley can be used as a companion crop for other grasses and legumes also, but oats are more competitive than flax for light and moisture.

The use of a grass seeder attachment on a press drill is suggested. If a press drill is not available, packing following drilling in some way is desirable if wind erosion is not a hazard.

The seeding depth for legumes and grasses should not exceed 1 inch and 1/2 inch is preferable on heavy soils. Grasses and legumes should not be mixed in the drill box with cereal crops because they will be seeded too deep to emerge. Grasses and legumes can be mixed with flax if the seedbed is very firm and seed depth is approximately 3/4 inch.

SEED FORAGES EARLY

Plant legumes or grasses alone or in a grass-legume mixture in late April or early May with flax. If cereal crops are used as a companion crop, seed at about 3/4 the normal rate. Grasses alone may be seeded without a companion crop on summerfallow from mid August to early September, although some weed control by mowing may be necessary.

SEEDING RATES

The grasses shown in the table should be seeded at a rate of about 10 to 12 pounds an acre when seeded alone, or 6 to 10 pounds an acre in mixtures. A legume should be seeded at a rate of 8 to 10 pounds an acre alone or 2 to 6 pounds an acre in mixtures.

Grasses and legumes in the mixture will depend on how you will use the forage. For hay only, mixtures high in legume, or a legume alone, may be preferable. If you want the forage for pasture or hay, you may wish to decrease the amount of legume because of the bloat hazard when grazing most legumes.

FORAGE CROP INFORMATION AND RECOMMENDATIONS FOR NORTH DAKOTA

Forage Species	Expected acre production ²				Varieties to use	Palatability; utilization	Highest Yield in	Adaptation ¹ in		Special site adaptation; other remarks; weak points, etc.
	Tons of hay		Cow grazing days					East	West	
	East	West	East	West						
GRASSES ³										
Bromegrass	2-3	.5-1	135	85	Achenbach, Southland, Lincoln, Northern	Very good	May-June	A	B	Best with good rainfall
Crested wheatgrass	1.5-2	.5-1	90	75	Common, Nordan	Good	May-June	B	A	Coarse when mature
Intermediate wheatgrass	1-2	.5-1	90	75	Common, Nebr. 50	Good	May-June	B	B	Poor recovery
Slender wheatgrass	1-2	.5-1	90	75	Primar	Good	May-June	B	B	Short lived
Tall wheatgrass	2-3	.5-.8	80	50	Common	Poor	May-June	B	B	Coarse; grows on wet, salty or alkaline soils
Green Stipagrass	2-3	.5-1	100	75	Common	Good	All season	B	A	Dormant seed; establishes slowly
Reed canarygrass	2-3	-	100	-	Common	Fair	All season	B	C	Coarse; graze while immature; wet sites
Russian wildrye	1.5-2	.5	90	60	Common	Good	Spring, fall	B	B	Good fall growth
Native grass;	-	.5	-	20-40	-	Good	Summer	C	A	Defer grazing until June 1 - July 1 for most production
Blue gramagrass	-	-	-	20-40	Common	Good	Summer	C	A	
Western wheatgrass, etc.	-	.5-1	-	20-40	-	Good	May-June	C	A	
Sudangrass	3-4	1-1.5	150	75	Piper	Very good	July-August	A	B	Certified Piper for pasture; Sweet o.k. for silage
Forage sorghums	4-6	2-3.5	-	-	Rancher, Leoti Red, Fremont	Very good	July-September	B	C	Silage or bundle feed; high HCN, not grazed; can seed late
LEGUMES ⁴										
Alfalfa	3-4	1.5	150	90	Ladak, Ranger, Vernal	Very good	All season	A	B	High summer yield, bloat hazard; best forage for hay
White sweetclover										Best for silage; careful management for pasture; some bloat hazard; contains coumarin, avoid moldy hay or moldy silage;
Common	3-3.5	1.0	125	75		Good	June-July	A	B	
Evergreen	3.5-4	1.5	130	90		Good	June-August	A	B	
Spanish	3-3.5	1.5	125	80		Good	June-July	A	B	
Yellow sweetclover										Starts slowly in spring; little bloat hazard; seed production in Red River Valley
Common	2.5-3	1.0	110	75		Good	June-July	A	B	
Madrid	3-3.5	1.5	110	75		Good	June-July	A	B	
Birdsfoot trefoil	2.5-3	-	100	-	Empire, Viking	Good	June-August	B	C	
Red clover	2-3	-	100	-	Common, Dollard, Kenland	Very good	All season	C	C	Good rainfall needed; bloat, seed production in Red River Valley
MIXTURES										
Alfalfa-brome	3-4	1-1.5	140	90	See Above	Very good	All season	A	B	Good yield; bloat hazard
Sweetclover-slender wheatgrass	3-3.5	1	90	75	See Above	Good	June-August	A	B	Good yield; bloat hazard
Alfalfa-brome-crested	3-4	1-1.5	140	90	See Above	Very good	All season	B	A	Good yield; bloat hazard

1. A-good; B-intermediate; and C-poor adaptability.
2. Production figures are estimates based on yield and pasture trials and assume the presence of average soil moisture, a good stand, and reasonable management of the forage; grasses alone need nitrogen fertilizer for good production.
3. Buy treated seed or treat at rate 8 ounces Arason per 100 lbs. seed, dust or slurry; seed 10 to 12 lbs. per acre alone, 8 to 10 lbs. with legumes.

4. Inoculate legume seed with proper nodule-forming bacteria, available at most retail seed stores at very low cost; avoid mixing with fungicide treated seeds; seed at 8 to 12 lbs. per acre alone, 2 to 6 lbs. an acre with grasses for forage. Seed trefoil at 4 lbs. per acre and red clover at 5 to 6 lbs. an acre for seed production.

In very favorable years, 2 pounds of alfalfa in a brome-alfalfa mixture may produce as many surviving plants as 6 pounds of alfalfa in the mixture.

Seasonal variation in the proportion of alfalfa or brome-grass in a mixture usually is greater than any small variation in proportional seeding rate. For example, a brome-alfalfa mixture will be mostly brome-grass early in the spring and as the brome-grass decreases its growth during July and August the proportion of alfalfa in the mixture will increase rapidly. The brome-grass also will tend to crowd out the alfalfa in the mixture over a period of years under average grazing management conditions.

NITROGEN IMPROVES PASTURE

Forage yields of pure brome-grass and other pure grass stands have been increased up to 350 percent by the application of 300 pounds of ammonium nitrate an acre in the fall or early spring, at Fargo.

The quality of this forage also was improved as the protein content at a hay stage of growth was increased from 9 percent in the forage receiving no nitrogen fertilization to 12 percent in that receiving 300 pounds of ammonium nitrate. Production of digestible protein by fertilized grasses at Fargo has cost less than half as much as protein purchased as soybean meal.

Pure stands of grasses may not need nitrogen fertilization in their first harvest year. But nitrogen applied in the fall thereafter will usually increase yields. No burning due to excessive nitrogen fertilization in dry years has been observed at Fargo. Adequate soil moisture is needed to produce increased forage production.

Response of old pure grass stands to nitrogen fertilization is more variable in drier parts of North Dakota. This is indicated by experiments at Dickinson and Mandan and is dependent mostly upon the amount of available soil moisture.

Superphosphate has given no consistent increase of forage or seed yields on grasses at Fargo. However, the application of superphosphate to legumes in areas where the soil is known to be phosphorus deficient may increase forage yields of these legumes. A soil test of the field involved should reveal the soil phosphorus level and whether or not fertilization is necessary.

PLANT GRASSES IN ROWS FOR SEED

Most grasses should be seeded at 2 to 3 pounds an acre in cultivated rows spaced 2 to 3-1/2 feet apart for seed production. Rows seeded around a field with solid drilled corners and regularly spaced drilled strips for dropping windrows will help in the use of large machinery. Use of a self-propelled swather will simplify row-solid seeding arrangement and harvest.

Flax may be used as a companion crop. The flax can be seeded first, followed by the grass in a separate operation.

Apply 200 to 400 pounds of ammonium nitrate, 33-0-0, an acre in the fall before the second harvest year and in succeeding years.

Seed can be grown in solid drilled seedings although yields usually will be lower than in cultivated rows especially in dry years. Sweet-clover for seed can be grown successfully in solid seedings or cultivated rows. Good harvesting methods are essential to high yields.

Raising alfalfa for seed production only is not recommended because of low seed yields and keen competition from special seed producing areas.

IRRIGATION UPS FORAGE YIELDS

Forage production in most areas of North Dakota is limited by inadequate soil moisture. Irrigation of forages should result in very large increases in their production. If irrigation is possible, grow the kinds best adapted to a higher soil moisture content and highest forage production.

Your county extension agent, local experiment branch station, or the Great Plains Field Station at Mandan, or forage specialists at NDAC experiment station, can give you more information on forages to grow under irrigation. Forages different than those now grown under dryland conditions may be best adapted and most productive under irrigation in a given area.

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