

# GROW BETTER PASTURES



## WITH GRASSES AND LEGUMES

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EXTENSION SERVICE

NORTH DAKOTA AGRICULTURAL COLLEGE AND U. S. DEPARTMENT  
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# GROW BETTER PASTURES

Improved pastures can be profitable when the right grasses and legumes are grown, and when sound pasture production practices are followed. 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 North Dakota Agricultural College Experiment Station to help you increase your pasture income.

## PROPER SEEDING FAVORS GOOD "CATCHES"

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 very acceptable for seeding grasses or legumes.

The use of flax as a companion crop is recommended. Flax is the best companion crop because it competes the least with the small grass and legume plants. Sweetclover may get 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 are sometimes 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 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 the legumes and grasses should not exceed 1 inch and 1/2 inch is preferable on heavy soils if moisture is adequate. Grasses and legumes should not be mixed in the drill box with cereal crops because they will be seeded too deep to emerge.

## SEED FORAGES EARLY

Legumes or grasses alone or a grass-legume mixture should be seeded in late April or early May with flax, or, if cereal crops are used as a companion crop, these should be seeded at

USE THIS TABLE AS AN AID IN PLANNING YOUR FORAGE NEEDS AND YOUR USES FOR IT

Forage Species	Expected acre production <sup>2</sup>				Variety to use	Palatability; Utilization	Highest Yield in	Adaptation <sup>1</sup> in		Special site adaptation; mixture companion; weak points, etc.
	Tons of hay		Cow grazing days					East	West	
	East	West	East	West						
<b>GRASSES<sup>3</sup></b>										
Bromegrass	2-3	.5-1	150	90	Lincoln, Northern	Good	May-June	A	B	Best with good rainfall
Crested wheatgrass	1.5-2	.5-1	100	80	Common, Nordan	Fair	May-June	B	A	Coarse when mature
Intermediate wheatgrass	1-2	.5-1	100	80	Common, Nebr. 50	Fair	May-June	B	B	Poor recovery
Slender wheatgrass	1-2	.5-1	100	80	Primar	Fair	May-June	B	B	Short lived
Tall wheatgrass	2-3	.5-.8	100	60	Common	Poor	May-June	B	B	Coarse; grows on wet Alkaline soil
Green stipagrass	2-3	.5-1	120	80	Common	Fair	All season	B	A	Dormant seed;
Reed canarygrass	2-3	-	120	-	Common	Fair	All season	B	C	Coarse; must graze im-mature; wet sites
Russian wildrye	1.5-2	.5	100	60	Common	Fair	Spring, fall	B	B	Good fall growth
Mandan wildrye	1.5-2	.5-1	120	75	Mandan	Poor	May-June	B	B	Intermediate wheat-grass replacing
Native grass;	-	.5	-	20-40	-	Good	Summer	C	C	Mostly warm season
Blue gramagrass	-	-	-	20-40	Common	Good	Summer	C	A	Difficult to seed
Western wheatgrass, etc.	-	.5-1	-	20-40	-	Fair	May-June	C	A	
Sudangrass	3-4	1-1.5	180	75	Piper	Very good	July-August	A	B	Certified; Sweet good for hay or silage
<b>LEGUMES<sup>4</sup></b>										
Alfalfa	3-4	1.5	180	90	Ladak, Ranger	Very good	All season	A	B	High summer yield, bloat hazard
Common white sweetclover	3-3.5	1.0	150	75	Common	Good	June-July	A	B	Careful management, bloat hazard
Evergreen white sweetclover	3.5-4	1.5	150	90	Evergreen	Good	June-August	A	B	Careful management; late; bloat hazard
Spanish white sweetclover	3-3.5	1.5	150	80	Spanish	Good	June- July	A	B	Careful management; bloat hazard
Yellow sweetclover	2.5-3	1.0	120	75	Common	Good	June-July	A	B	Careful management; bloat hazard
Birdsfoot trefoil	2.5-3	-	100	-	Empire, Granger, Viking	Good	June-August	B	C	Slow starter; little bloat hazard
Red Clover	2-3	-	100	-	Common	Very good	All season	C	C	Good rainfall; bloat
Ladino clover, irrigated	2.5-3	-	120	-	Certified	Very good	All season	C	C	Need irrigation, bloat hazard
<b>MIXTURES</b>										
Alfalfa-brome	3-4	1-1.5	180	100	Ranger, Ladak, Lincoln	Very good	All season	A	B	Good yield; bloat hazard
Sweetclover-slender wheatgrass	3-3.5	1	100	75	Spanish, Primar	Good	June-August	A	B	Good yield; bloat hazard
Alfalfa-brome-crested	3-4	1-1.5	180	100	Ladak, Lincoln, Std., Nordan	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.

3 Buy treated seed or treat at rate of 8 ounces Arasan per 100 pounds of seed, dust or slurry.

4. Inoculate legume seed with proper nodule-forming bacteria, available at most retail seed stores at very low cost.

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 FOR PURE STANDS AND MIXTURES

The grasses shown in the table should be seeded at a rate of about 10 to 15 pounds an acre when seeded alone or 6 to 10 pounds an acre in mixtures. A legume should be seeded at a rate of 5 to 8 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. If the forage is to be used for hay only, mixtures high in legume, or a legume alone, may be preferable. On the other hand, 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.

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.

### SEED 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. Flax may be used as a companion crop although the flax should be seeded first, followed by the grass in a separate operation.

The application of 100 to 300 pounds of ammonium nitrate an acre in the fall before the second harvest year and in succeeding years is recommended. Seed can be grown in solid drilled seedings although yields usually will be lower than in cultivated rows especially in dry years. Sweetclover 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.

## NITROGEN GIVES MORE AND BETTER PASTURE

Forage yields of pure bromegrass 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 very markedly. 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.

The application of 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 result in increased 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.

## IRRIGATION BOOSTS FORAGE YIELDS

Maximum 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, those species best adapted to a higher soil moisture content and maximum forage production should be grown.

Your county extension agent, local experimental substation, or the Great Plains Field Station at Mandan, or forage specialists at the Fargo experiment station should be consulted regarding forages to grow under irrigation. Different forages than those now grown under dryland conditions may be best adapted and most productive under irrigation in a given area.