EDUCATION •RESEARCH • EXTENSION
The Texas A&M University System

Soil & Crop Sciences

Managing of Annual Winter Forages in Southwest Texas

Mr Charles Stichler
Associate Professor and Extension Agronomist
Texas A&M Research and Extension Center at Uvalde

College of Agriculture and Life Sciences
The Texas Agricultural Experiment Station
The Texas Agricultural Extension Service

Texas A&M University System
Department of Soil and Crop Sciences
College Station, Texas 77843-2474

SCS-1997-03

Managment of Annual Winter Forages in Southwest Texas

Charles Stichler
Associate Professor and Extension Agronomist
Texas A&M Research and Extension Center at Uvalde

Introduction

Winter annual pastures in Southwest Texas provide high quality forage for cattle, sheep and goats when native and bermudagrass pastures are dormant. They offer high nutritional value which extends from the time they start growing until heading in the spring. Because of the expense necessary to establish winter pastures, they are best suited for a stocker cattle or high profit animals. Small grains provide nutrition in excess of the needs of a dry pregnant cows. To get the maximum economic return, winter forages should be best utilized by high profit livestock.

Properly managed winter annuals are next to legumes in producing consistant high protein and highly digestable forage. Without adequate management however, the full potential may not be fully utilized. Such decisions as irrigation management (if available), planting date, cultivar selection, fertilizer applications and grazing management are all related and may greatly effect production.

Grazing management has two major components: 1) to maintain a healthy plant stand and 2) convert forage into a salable animal product. Without a healthy plant, forage (and grain) production is reduced and animal gains may be disappointing.

Planting Considerations

Temperature

Although small grains are a "cool" season plant, they do require sufficiently warm temperatures for the plant to maintain growth. When average temperatures drop below 50 degrees, plant processes begin to slow down and growth is reduced. If early grazing is needed, planting should begin in early September and possibly utilize fall rains for their best adavantage and grazed by mid-October under good growing conditions. Consideration should also be made on planting date if the small grain is to be harvested for grain. For example, oats need to be planted later to prevent heading before cold weather begins if they will not be grazed. Later planted wheat may have less rust problems than early planted wheat. Cool soil temperatures are important for good germination and establishment for small grains, daily minimum temperatures should be below 75 degrees F for good stand establishment.

Cultivar Selection

Annual winter grasses include oats, barley, rye, wheat, triticale and annual ryegrass. Rye (Elbon rye) is generally considered the earliest to provide grazing, but it also matures first, followed by wheat, barley, oats and ryegrass. Ryegrass will provide 4-6 weeks of extra grazing in the spring due to its late maturity. Wheat and oats have been the traditional small grains to plant in Southwest Texas for many years. They offer the advantage of harvesting a grain crop in addition to livestock grazing. However, plant diseases such a Barley Yellow Dwarf Virus, new races of leaf rust in wheat and crown rust in oats can cause considerable production losses. Oats often freeze during cold winters and grazing is greatly reduced, leaving the owner looking for feed.

Annual ryegrass breeding work has developed several new varieties that are suitable for southwest Texas. TAM 90 (developed by Texas A&M), Marshall and Jackson are better forage producers than the older Gulfcoast ryegrass which was adapted to wet humid conditons. Ryegrass is not as susceptible to rust and bloating is almost eliminated. Ongoing research work at the Texas A&M Research and Extension Center in Uvalde, has shown ryegrass to produce as much or higher quality forage as other small grains. However, most of the forage is produced in the spring after February until early May if water is available. When seeding rates are increased, to 25-30 pounds of seed/acre, early forage production was greatly increased over the standard planting rate of 15 pounds/acre. Another alternative is to plant oats at 5 - 10 pounds per acre with ryegrass to provide early fall grazing.

Grass	Advantages	Disadvantages
Rye	Most drought tolerant	Early maturity - early termination
	Most cold tolerant	Can become infested with ergot (poisonous)
	Rapid fall growth	Unpalatable at boot stage
Wheat	Good cold tolerance	Least productive of cool season grasses
	Grazed or grained	Low disease tolerance to rust, etc.
	Drought tolerant	Bloat and grass tetney sometimes problems
Barley	Saline tolerant	Lower quality forage
	Good drought tolerance	Awns on seed barbed - mouth problems
Oats	Early fall grazing	Poor cold tolerance
	High forage quality - gains	Poor drought tolerance
	Germinate under limited moisture	Leaf and crow diseases
Ryegrass	Most popular cool season grass	Limited fall grazing
	Can be seeded by surface broadcast	Poor winter grazing in cold climates

Fertility

Taking a soil sample is the best way to determine what nutrients are adequate, what nutrients may be lacking and at what amounts. With a soil analysis, a fertility program can be structured to supplement those nutrients that are insufficient. Without an analysis, nutrients may be either wasted, add to ground or surface water pollution or result in insufficient nutrient levels for maximum production.

Nitrogen and Water

Just like in animals, nitrogen is the critical element of amino acids and proteins in plants. Without adequate nitrogen, plants cannot produce new growth. Although the other elements are important, nitrogen is the only element that actually causes the plant to grow. A good rule to remember is that it takes .36 pounds of nitrogen to produce 10 pounds of forage to produce 1 pound of gain. Fifteen inches of water will produce approximately 4500 pounds of dry matter and use 165 pounds of nitrogen and yield 450 pounds of gain. Another guideline to remember is it takes 70 pounds of nitrogen per ton of forage produced.

Grasses use nutrients in 3-1-2 ratio of N,P and K. The following is a suggested fertility program for maximum production if the field is to be irrigated and grazed heavily. Use 80-40-60 at planting followed by 60 pounds of nitrogen in late December or early January. Apply an additional 80 pounds of nitrogen in early March just prior to early spring growth for maximum forage or grain yields. As livestock consume forage, they will extract the nutrients needed for their body growth. Most nitrogen is used by the animal, but much of the phosphorus and potassium is returned to the soil in manure.

Phosphorus

Good seed bed preparation includes providing adequate nutrients for early growth. Phosphours is essential for early secondary root development. If phosphorus is limited, tillering can be reduced. Recent work by Dr. Travis Miller, Small Grains Specialist, has shown the importance of phosphorus (P). Equally important is the placement. Forage yields, especially early growth, were increased from 50-400% just by proper placement of the P. Fields adequately fertilized with P in the upper 2-3 inches however, did not show the forage response as when the fertilizer was banded 5-8 inches deep. Grain yields also benefit with an average yeild increase of 15%. If soils were dry, the response was generally greater.

Phosphorus moves very little in soils under the best of conditons. In dry soils P does not move. If P is spread on the soil surface or even shallow incorporated, 2-3 inches deep, there are very few active roots in that region. Since plant roots cannot absorb nutrients in dry soil, (even if roots were in the top 2-3 inches), the soil surface dries out first. With most roots are below the seed, there is nothing to absorb the P.

Deep placed P will be in a region of active root absorption — so uptake is greater. In addition, banding P reduces the soil to fertilizer contact and less P is tied up by calcium and is available for a longer period of time. For optimum return of phosphorus, place it deep.

The following chart shows the approximate pounds of nutrients found in forages at different yield levels.

Water - Fertility - Production		
Forage Pounds/Acre	**N-P-K**	**Inches Water**
2000	60-20-40	7
4000	120-40-80	14
6000	180-60-120	20
8000	240-80-160	27

Grazing Management

Consider the plant first when deciding on a grazing management plan. In plants, leaves are more important than roots. Without leaves, the plant cannot create energy and food. Plants are structured so that if the leaf area is radically reduced, then the plant will start robbing the root system to replace the foliage. In grazing, if plants are not allowed to develop and maintain adequate foliage, the root system will start to die. Once that happens, plant growth is in a downhill spiral with shallow roots that are not able to absorb nutrients and water and not sufficient foliage to carry on photosynthesis to generate energy for addtional growth. Plants should be allowed to grow to a height of at least 8 inches before harvesting forage. Animals should not be allowed to graze below 4 inches to maintain adequate leaf area for continued growth.

Rotational grazing is the preferred, although it requires more management than continuous grazing. Returns per acre however are higher while maintaining healthy plants. Management decisions necessary include:

1. How many animal units can a rotation maintain.
2. When to move to another pasture.
3. When and how much additional nitrogen to apply.
4. When and how much additional water to apply.
5. Peak hour grazing (ie. 2 hrs. in AM & 2 hrs. in PM) only.
6. Drylot animals during wet periods to reduce plant injury.
7. How long should pastures be rested before grazing.

For example, when turning into a field, actual intake will represent approximately 50% of forage disappearance. Thirty percent must be left to maintain the plant , hence only 35 % of the original forage was consumed. The remainder, about 30% is lost to trampling, weather, etc.

Due to different growing conditons, each pasture will have different growth rates and forage accumulation. It is important to balance with the actual the stocking rate with the amount of forage available.

With proper management, balancing available water for plant growth, nutrient levels with managed grazing, annual winter grasses can provide excellent forage. Common sense and understanding plant growth are needed to make timely decisions to maximize production and profitability.

There are formulas available and techniques for estimating forage which will not be covered here.

Annual Winter Forage Test
Brazos Co. - Upland Site
David Bade - Extension Forage Specialist
Stanley Simecek - Forage Breeding
Mark Hussey - Forage Breeding and Research

Variety	5 Year Average		Variety	5 Year Average	
	Fall	Total		Fall	Total
Oats			**Ryegrass**		
Coronado	1411	5025	Gulf	1653	6856
Tam 386	1466	5325	Tetragold	1284	6401
Mesquite II	1877	6383	Allamo	1295	4738
Blizzard	1621	6716	Beefbuilder	1630	6818
Oat 833	1190	5644	TAM 90	1490	6537
Ozark	1365	5663	Rustmaster	1345	6346
			Marshall	1916	7144
			Jackson	1662	6795
Wheat			Southern St	1624	6635
Mit	824	6409			
Wintermast	2422	6470	**Triticales II**	405	5296
Rye			**Mixture - Oats - Ryegrass**		
Elbow	1421	5361		1737	6801