



RANGE SCIENCE REPORT

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IMPROVING FEED PRODUCTION WITH ANNUAL LEGUMES

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INTRODUCTION

Gains of 150 to 300 pounds of beef per acre can be consistently produced on annual legume improved ranges. In "good clover years" this type of production is possible on clover alone. However, since good clover years do not occur every year, the introduction of annual legumes, including sub-clover, roseclover, and annual medics is recommended. Maximum profit per acre results from careful attention to adequate soil fertility, seeding adapted varieties, and good grazing management.

FERTILITY

Most lands planted to annual legumes are deficient in either sulfur or phosphorus, or both, so that adequate amounts of them must be added to produce a good initial stand and to maintain maximum forage and seed production.

SEEDBED PREPARATION

Some seedbed preparation is often necessary to reduce competition and provide for seed coverage; however, direct seeding in low residue has been successful in many locations. A light disking is preferred so that small legume seeds will not be buried too deep.

SEEDING METHOD

Seed can be drilled or broadcast by air or ground rigs. A broadcast seeding should be lightly covered by ring rolling or harrowing. Range drills are commonly available from area seed companies.

SEEDING DATE

Seeding should be done as close to the first fall rain as possible and before cold weather. Fall seedings in October and early November are much more successful than December seedings. If germinating rains do not come before cold weather, delay seeding until the following year.

GRAZING MANAGEMENT

Legumes stimulate the early growth of grasses and filaree. In the winter and early spring, seeded ranges should be grazed to use the grass and prevent nonlegumes from crowding the clovers. Reduce grazing while clover is blooming in order to allow an adequate seed set. Stands should be heavily grazed during the summer and fall to make use of the dry feed and to trample the seed into the ground. More stands of clovers have been lost by too light grazing than by overgrazing.

VARIETIES TO USE

Rose and subterranean clover are most commonly used and grow well together on neutral to acid soils. The annual medics tend to be best adapted to neutral to basic soils. Several varieties of annual clovers and annual medics mature over a wide range of dates from very early to very late spring (Table 1). Some subclovers are adapted to wet or poorly drained soils. Most fields to be seeded contain a variety of soils so that the seeding mixture should contain several varieties and types of clover. It should include both early and late maturing varieties that are adapted to a variety of sites to ensure good forage growth during very dry winters or springs, as well as under "normal" conditions. Here is a suggested mixture for Amador County as an example:

Seeding Rate (lb/a)

3-4	Wilton Rose Clover
3-4	Northam or Nungarin Subterranean Clover
3-4	Woogenellup Subterranean Clover
<u>3-4</u>	Mt. Barker Subterranean Clover

12-16 TOTAL

You will want to consult your farm advisor for specific recommendations for your area.

INOCULATION

Clovers need to grow in association with certain soil bacteria (Rhizobium) to provide the nitrogen they need for growth. In most areas these required strains of bacteria are not present in the soil and must be furnished by inoculating the seed with the right bacteria at seeding time. Well-inoculated clovers supply extra nitrogen to make the associated grasses grow better. The pellet method of inoculation is recommended.

ESTABLISHING ANNUAL CLOVERS

- (1) Select an area that can be disked.
- (2) Apply 400 to 500 pounds of superphosphate (0-25-0) per acre.
- (3) Prepare a seedbed by a light shallow disking, not over 4 inches in depth or use a rangeland drill for direct seeding.
- (4) Seed 10 to 15 pounds of pellet-inocuated seed per acre before November 1 and roll or harrow to cover the seed.
- (5) Graze the stand lightly the first spring to keep the grass from crowding out the clover. Livestock should be put on the field as soon as it can be grazed without too much "punching".
- (6) Remove the livestock during April and May the first year to let the clover set a good seed crop.
- (7) Graze again during the summer or fall in order to remove most of the clover and grass residue and trample the seed into the ground.

GRAZING THE ESTABLISHED STAND

Graze any time during the fall, winter, or spring with enough livestock to keep the grass growth down. Adjust the cattle numbers to let the clovers bloom and set seed (during March and April in dry years, and April and May in a normal year). More stands of clover have been lost by too little grazing than by too much grazing.

ANNUAL LEGUME FACT SHEET

	Minimum rainfall (inches)	Flowering date	Estrogen level	Hard seed content	Number seeds per pound (1,000)
<u>SUBTERRANEAN CLOVERS</u>					
<u>Early Season</u>					
Nungarin	10	Late Feb.	Low	Very high	65
Northam	10	Early Mar.	Low	High	70
Geraldton	10	Early Mar.	High	Medium	85
<u>Early Mid Season</u>					
Daliak	12	Mid Mar.	Low	Medium	80
Yarloop ¹	18	Mid Mar.	Very high	Medium	60
Seaton Park	18	Mid Mar.	Low	Medium	65
Trikkala ¹	18	Mid Mar.	Low	Low	50
<u>Mid Season</u>					
Dinniup	18	Late Mar.	Very high	High	85
Esperance	20	Early Apr.	Low	Medium	70
Woogenellup	20	Early Apr.	Low	Low	60
Howard	20	Early Apr.	High	Low	80
Clare ²	20	Early Apr.	Low	Very low	70
<u>Late Season</u>					
Mt. Barker	25	Late Apr.	Low	Very low	70
Larissa ¹	25	Late Apr.	Low	Low	60
Nangella	30	Late Apr.	Low	Very low	70
Tallarook	35	Early May	High	Very low	60
<u>MEDICS²</u>					
Bur	10	February	N.A.	High	145
Harbinger	10	January	N.A.	High	190
Hannaford	10	February	N.A.	High	110
Jemalong	10	February	N.A.	High	110
<u>ROSE CLOVERS</u>					
Olympus	10	February	Low	Very high	155
Hykon	12	February	Low	Very high	135
Kondinin	12	March	Low	Very high	165
Wilton (common)	15	April	Low	Very high	160
CRIMSON CLOVER	15	March	N.A.	High	140

¹For waterlogged conditions.

²For neutral to basic soils.

Table 2. Expected forage and meat production under favorable, average and unfavorable weather conditions for several soils.

Site and Practice	Dry Matter (lbs/a)		
	Favorable	Average	Unfavorable
Soil Series: Altamont (Nacimiento, Ayar, Myers)			
Unimproved	3300	1800	800
Annual Legume (Unfertilized)	3850	1780	
Annual Legume (120 lbs/a S as gypsum)	3940	1775	
Annual Legume (200 lbs/a P as 0-40-0)	5350	1975	
Annual Legume (120 lbs /a S & 200 lbs/a P)	5510	2010	
Annual Legume (4000 lb/a lime)	4810	1955	
Soil Series: Corning			
Unimproved	2000	1100	300
Annual Legume (Unfertilized)	2800	1100	700
Annual Legume (300 lbs/a 0-20-0)	5700	2860	1995
Series: Josephine			
Unimproved	2900		800
Annual Legume (Unfertilized)	3600		
Annual Legume (600 lbs/a 0-20-0)	6800		
Annual Legume (285 lbs/a 0-35-0-20)			3700
Soil Series: Laughlin			
Unimproved	3000	2000	900
Subclover (Unfertilized)	3600		
Subclover (20 lbs/a as gypsum)	5400		
Subclover (40 lbs/a as gypsum)	6300		
Subclover (80 lbs/a as gypsum)	6700		
Subclover (200 lbs/a 0-38-0-20)	7500		
Series: Newville (Corning, Red Bluff, Dibble, Perkins, Redding, Pleasanton)			
Unimproved	1800	1200	300
Annual Legume (Unfertilized)	4000		
Annual Legume (650 lbs/a 0-20-0-16)	5000		
Annual Legume (350 lbs/a of 0-40-0-20)	5000		
Annual Legume (300 lbs/a sulfur)	4700		
Series: Sutherland			
Unimproved	3000		
Subclover (Unfertilized)	3400		
Subclover (200 lb/a 0-38-0-20)	6100		
Series: Yorkville			
Unimproved	2800		
Subclover (Unfertilized)	2800		
Subclover (200 lb/a 0-38-0-20)	4210		
Series: Aubrun (Sobrante, Las Posas, Argonaut) Beef (450-800 lbs) lbs/a			
Unimproved (less than 50% canopy)	45		
Annual Legume (Unfertilized)	89		
Annual Legume (40 lb/a N as Urea)	126		
Annual Legume (80 lb/a N as Urea)	153		
Annual Legume (40 lb/a N, 30 lb/a P, 33 lb/a S)	195		
Annual Legume (80 lb/a N, 30 lb/a P, 33 lb/a S)	215		
Annual Legume (30 lb/a P, 33 lb/a S)	128		
Annual Legume (60 lb/a P, 66 lb/a S)	175		
Series: Laughlin Lamb (without ewes) lbs/a			
Subclover (Unfertilized)	817		
Subclover (188 lb/a S)	1313		
Subclover (50 lb/a S)	1162		
Subclover (188 lb/a S, 50 lb/a P)	1528		