

# **PUBLICATIONS**

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## CHAPTER 3

### RYEGRASS ESTABLISHMENT

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#### Seed Quality

Good ryegrass stands begin with high quality seed. Texas state law requires that agricultural seed sold in Texas must have a vendor's statement of analysis tag attached to the bag (Texas Dept. of Agric., 1994). This tag contains information on where the seed was produced, percent pure seed, name and number of noxious weeds per pound of seed, percent germination and hard seed, and when the seed was tested. Texas state law also requires that seed be tested within 9 months of being sold. Percent germination and testing date are very important when pricing seed from several sources. If more than 5 to 6 months have passed since testing, percent germination has probably declined. The amount of decrease would depend on the temperature and humidity conditions under which the seed was stored.

Purchasing certified seed is a guarantee you are getting the variety you want. In Oregon, where most of the ryegrass seed is produced, the certification program is a cooperative effort between the Oregon Agricultural Experiment Station, Oregon Agricultural Extension Service and seed producers. Required field inspections are a joint effort between County Extension Agents and the Seed Certification Department. All fields growing Certified seed are recorded on computer and identified by county, grower, address, town, field number, acres, plant species and variety. This information follows the seed lot through seed cleaning, processing, and testing. A producer should compare varieties, seed prices, and respective germination rates early so he can purchase the best quality seed for the lowest price.

#### Planting Dates

Ryegrass seed germinates well at day/night temperatures from 59/36°F to 95/72°F (Nelson et al., 1992). Germination dropped to about 30% at higher temperatures. These results are supported by Young et al. (1975) who reported at least a 80% germination from a day/night temperature of 50/36°F to 86/77°F. Ryegrass seed germinated at day temperatures up to 104°F if night temperatures ranged from 68 to 77°F. Although ryegrass seed will germinate at these high temperatures, the seedlings will not survive. Data from these studies indicate that daily minimum temperatures around 75°F or lower are necessary for good ryegrass seed germination.

Planting ryegrass on a prepared seedbed from mid September to early October produces the greatest amount of forage (Kee et al., 1995). Plantings made later will be less productive because the lower temperatures will slow seedling development and early growth (Evers, 1981; Craigmiles and Weihing, 1973). Planting in September has the risk of seed germinating from existing soil moisture or a light rain, then dying from drought. Probability of losing a ryegrass stand to drought decreases as planting is delayed. However, the opportunity for early forage production also decreases as planting date is delayed. A planting date study on prepared seedbed in southeast Texas shows total forage production decreasing as planting is delayed past October 1 (Table 1). Because cooler autumn temperatures occur sooner in northeast Texas, the third week of September would be the optimum planting time for that area. Success of September plantings are improved by planting in a prepared (disked) seedbed where competing grasses and weeds are destroyed and seed are placed at a 1/4 to 1/2 inch depth.

Table 1. Influence of planting date on ryegrass forage production and distribution when planted on a prepared seedbed at Beaumont, 3 yr. average (Craigmiles and Weihing, 1973).

Date seeded	Pounds dry matter per acre by clipping dates					Total
	30 Nov.	11 Jan.	17 Mar.	19 Apr.	18 May	
September 1	969	2072	2513	1473	52	7079
September 15	1158	2417	2421	1554	48	7598
October 1		3891	2757	1781	68	8497
October 15		3774	2317	1879	83	8053
November 1		3308	2937	1552	91	7888
November 15		198	4476	992	123	5789
December 1			3718	2433	99	6184

Mid-October is the optimum time for overseeding ryegrass on a warm-season perennial grass (Alison and Ashley, 1993). Disking the grass sod lightly immediately before or after seeding improved early ryegrass production unless planting was delayed until December (Table 2). October temperatures are cool enough to limit growth and competition from the warm-season grass and also enhance seedling survival of seed planted on or near the soil surface.

Table 2. Effect of planting date and light disking on forage production by April 1 of ryegrass overseeded on bermudagrass, Winnsboro, LA, 3 yr. average (Alison and Ashley, 1993).

Light disking	Planting date				
	Middle Sept.	Early Oct.	Late Oct.	Middle Nov.	Early Dec.
	-----Dry forage, lbs/acre-----				
Before planting	1635	3052	3008	2285	2215
After planting	1581	2995	2829	2179	2467
None	855	2564	2373	1566	2391

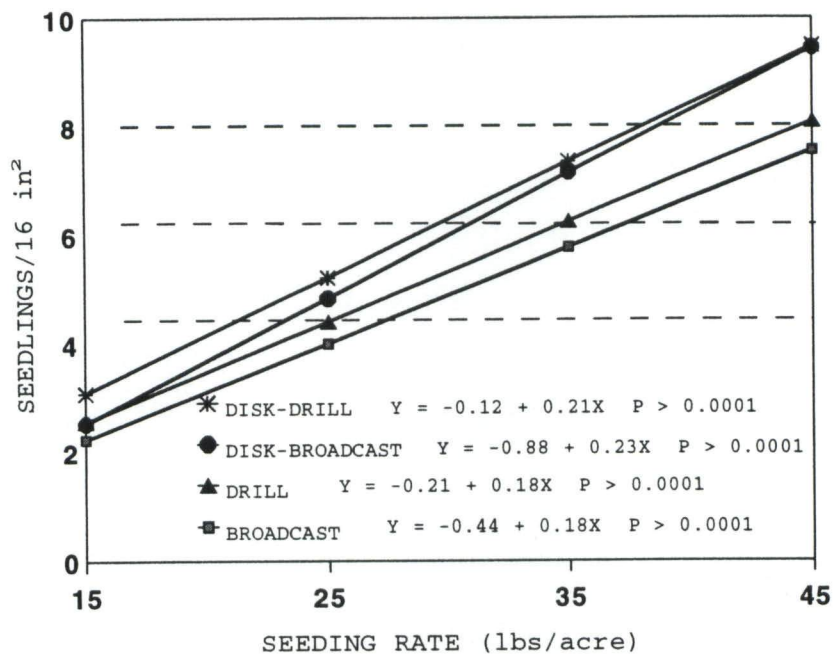
### Seed Rates

A minimum of 50 to 60 seedling/ft<sup>2</sup> is necessary for satisfactory ryegrass stands (Evers and Nelson, 1994). Planting 25 lb/acre will usually reach this level of seedling density. Seedling density can be improved by increasing the seeding rate which results in slightly earlier grazing. Planting method used will also influence seedling density. Drilling or broadcasting the seed on a lightly disked sod resulted in a higher seedling density than broadcasting or drilling seed on an undisturbed sod at the same seeding rate (Fig. 1). Disking reduces the competition from the warm-season grass and provides some loose soil for better seed placement. This results in a higher percentage of the germinating seed becoming established seedlings.

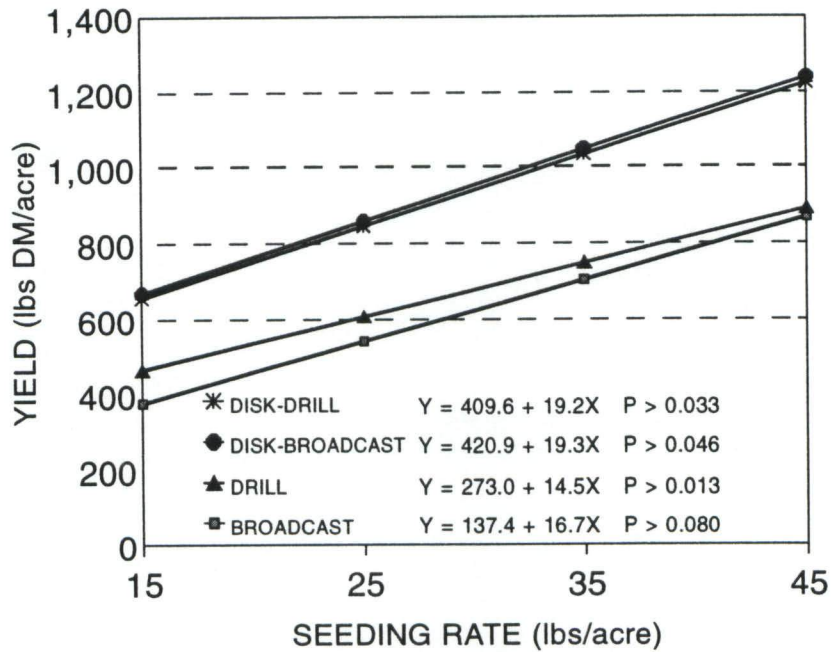
Increasing seedling densities by planting more seed and/or using better planting methods will also improve early forage production (Fig. 2). Whether the additional cost of extra seed or disking is justified for the potential of earlier forage production will depend on each producer's particular situation. It is practical for dairymen to plant 40 lb or more per acre to obtain the earliest grazing possible for lactating dairy cows. Seeding rate and planting method have little influence on forage produced after February.

### Overseeding Warm-Season Pastures

The major use of ryegrass is for overseeding warm-season perennial grass pastures since the seed



**Figure 1. Influence of seeding rate and planting method on ryegrass seedling density six weeks after planting.**



**Figure 2. Influence of planting method and seeding rate on first harvest ryegrass yields (2 yr avg).**

does not have to be placed in the soil to obtain good stands. Overseeding with ryegrass extends the grazing season of the pasture 3 to 4 months and produces a higher quality forage than warm-season grasses. Getting light to the soil surface is important for good ryegrass establishment. Sod heights 4-in. or shorter are satisfactory for overseeding an open type sod such as 'Coastal' bermudagrass. Tight grass sods such as bahiagrass and common bermudagrass are more competitive and allow less sunlight to reach the soil surface. Grazing or mowing these grasses as short as possible and/or disking lightly should enhance ryegrass establishment and early forage production.

A consequence of a short sod and disking on Coastal bermudagrass in autumn for overseeding is slower bermudagrass recovery in late spring. In a 3-year study at the Overton Center, Coastal bermudagrass was mowed to a 1 or 4-in. height, then disked lightly or not disked and overseeded with ryegrass. An identical set of sod treatments was not overseeded. June production of bermudagrass was about 500 lb/acre less following ryegrass than if it was not overseeded (Table 3). Mowing bermudagrass to a 1-in. height reduced Coastal production by 250 lb/acre more than mowing to a 4-in. height. Early summer bermudagrass recovery was reduced about 600 lb/acre by light disking the previous autumn. A short sod and disking which improve early production of overseeded ryegrass are also the management practices which slow spring recovery of the summer grass. Therefore, it is better to overseed a pasture where an early hay harvest is not desired.

Table 3. Influence of autumn sod height and disking on Coastal bermudagrass recovery in June with and without overseeded ryegrass (3 yr. average, Evers, Overton).

	Ryegrass overseeded			Not overseeded		
	1-in.	4-in.	average	1-in.	4-in.	average
	-----lb DM/acre-----					
Undisturbed	1522	1778	1650	1989	2260	2125
Disked	887	1142	1015	1407	1602	1505
Average	1205	1460		1698	1931	

When overseeded, warm-season perennial grasses along the Upper Texas Gulf Coast, are more competitive to ryegrass seedlings because the average first frost date is not until December. Disking is not a good option because of the difficulty in preparing a seedbed on the heavy clay soil. Livestock bogging on winter pastures planted on a prepared seedbed is also a problem on level sandy soils as well as clay soils.

An alternative for Gulf Coast producers is applying a chemical desiccant before ryegrass planting in autumn. An ideal desiccant is one that top kills the warm-season grass quickly but does not restrict spring recovery of the grass. However, chemical desiccants which do a good job of top killing the grass usually cause loss of grass stand the following year (Table 4) (Evers, 1987). Gramoxone provided quick desiccation (24 hrs) but dallisgrass began greening up to 2 to 3 days after application. Roundup and gramoxone are the only chemicals labeled for no-till planting. Similar desiccation work has been done on bermudagrass (Grichar et al., 1987).

Applying 1/4 lb (a.i.)/acre of gramoxone to Coastal bermudagrass at Overton increased ryegrass-small grain yields 2 out of 3 years (Matocha, 1975). Early forage yields increased when applying gramoxone as the average November minimum temperature increased and time between planting and first frost increased. However, production from a small grain-ryegrass mixture was always substantially greater when planted on a disked sod than a sod not disked regardless if a desiccant was used.

### **Ryegrass Mixtures**

Forage mixtures are planted to take advantage of the strong points of different species. Ryegrass is mixed with the small grains, (rye, wheat, or oats) because it is later maturing and extends grazing into late spring. Rye and wheat in northeast Texas and oats in south central Texas have the advantage of earlier forage production than ryegrass. Recommended seeding rates are 75 to 100 lb/acre of rye, wheat, or oats with 20 lb/acre of ryegrass. Since good stands of small grains require placing the seed from 1/2 to 3/4 inch in the soil, these mixtures are limited to pastures that have been disked before planting or



Table 4. Effect of chemical desiccants on dallisgrass desiccation and spring recovery and first harvest yields of overseeded ryegrass at Angleton (Evers, 1987).

Herbicide	Rate lb(a.i.)/acre	Application before seeding	Desiccation rating <sup>1</sup> Oct. 20	First ryegrass harvest lb DM/acre	Dallisgrass recovery rating <sup>2</sup> Aug. 1
Control	--	--	1.00	898	5.00
Gramoxone	0.50	1 day	4.75	1,176	5.00
Roundup	0.50	1 week	3.75	2,073	.75
Dalapon	3.75	3 week	4.25	1,409	1.00
CGA-82725 + 1% C.O. <sup>3</sup>	0.25	3 week	1.50	1,194	4.50
CGA-82725 + 1% C.O.	0.12	3 week	1.00	1,077	4.75
Poast + 1 1/4% C.O.	0.12	1 week	1.75	916	4.75
Poast + 2 1/2% C.O.	0.12	1 week	1.75	1,050	3.75
Fusilade + C.O.	0.06	3 week	2.25	1,048	4.50
Fusilade + C.O.	0.12	3 week	4.00	1,277	4.00
Fusilade + C.O.	0.25	3 week	3.75	1,526	1.75
Fusilade + C.O.	0.25	1 week	1.25	727	1.75
Ignite	0.30	1 week	4.00	1,454	2.25
Ignite	0.45	1 week	4.50	1,400	1.25
Ignite	0.60	1 week	4.75	1,607	1.25
Ignite	1.20	1 week	5.00	1,723	.75
Ignite	1.80	3 week	5.00	1,696	1.00

<sup>1</sup>1 = no desiccation, 5 = 100% desiccation.

<sup>2</sup>Dallis recovery rating, 0 = no dallis, 1 = < 10% dallis stand, 2 = 25% dallis stand, 3 = 50% dallis stand, 4 = 75% dallis stand, 5 = 100% dallis stand.

<sup>3</sup>Crop oil at 1 qt/acre.

where a sodseeding drill is used.

Ryegrass is also mixed with clovers. Few producers have seed boxes on planters that can handle small clover seed adequately. Using 10 lb of ryegrass seed per acre as a carrier for the clover seed allow the ryegrass-clover mixture to be planted in a regular grain drill. Mixing ryegrass with clover also reduces the risk of bloat from grazing a pure stand of clover and provides earlier forage production than the clover alone. Twenty pounds of ryegrass is planted with 65% of the recommended seeding rate for a pure clover stand.

### **Ryegrass Reseeding**

The presence of ryegrass on roadsides and in pastures where it has not been planted for several years is testimony to its reseeding ability. Even under grazing, ryegrass has the ability to produce some seed. A high temperature seed dormancy helps prevent summer germination until early autumn when temperatures decline. Using a moderate stocking rate or removing livestock the last week of April will enhance seed production and volunteer ryegrass stands the following autumn (Evers et al., 1994). Mowing or grazing the warm-season grasses short in late September is necessary for good volunteer ryegrass stands. Stirring the soil surface with a light disking in early autumn also appears to help volunteer ryegrass stands.

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