SWITCHGRASS ESTABLISHMENT FOR PASTURE

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Background. Switchgrass (*Panicum virgatum* L.) is a native warm-season perennial grass that is grown throughout the Great Plains and eastward to the Atlantic Coast. It is used for pasture, hay, soil conservation, wildlife cover, and recently, as a biomass crop for conversion into alcohol fuels. As with most warm-season perennial grasses, establishment is difficult because of erratic seed germination and poor seedling growth. More risk is associated with establishment on sandy Coastal Plain soils because of their low water holding capacity and rapid drying of the soil surface after a rainfall event. Establishment practices and planting methods were evaluated at the Texas A&M University Agricultural Research and Extension Center to enhance switchgrass establishment.

General establishment categories were: 1) autumn planting including mixtures with cool-season annuals, 2) spring planting into winter crop stubble, and 3) spring planting with various forms of weed control. Planting method comparisons were broadcasting *vs* drilling seed and rolling before *vs* after planting. The order of land preparation was disking, roterra, and rolling. Plots were seeded at 5 lb PLS/acre in the autumn on October 8, 1998 and in the spring on April 8, 1999. Seed were drilled in 14 in. rows or broadcast by removing the seed drop tubes and allowing the seed to fall from the seed box.

Research Findings. Autumn plantings and spring seeding into a winter crop stubble were a failure (Table 1). Of the other spring planting treatments in prepared seedbed, the methyl bromide treatment resulted in the highest seedling density and heaviest seedlings. The methyl bromide provided complete weed control and demonstrates how vulnerable switchgrass seedlings are to plant competition during establishment. None of the other treatments were significantly different from the spring seeded control for seedling density, shoot weight, or plant height. None of the herbicide treatments improved seedling density over the control (data not shown). There are no herbicides which are approved for switchgrass establishment. The hand weeded treatment was superior to all herbicide treatments.

In the planting method study, drilling the seed at a 1/4 in. depth always resulted in higher plant densities than broadcasting the seed (Table 2). Rolling before or after seeding did not influence plant density. Neither shoot weight nor plant height were affected by planting method.

Application. Switchgrass seed should be drilled at a 1/4 in. depth in a well prepared and smooth seedbed. Weed competition was the main problem in establishing switchgrass. At this time, there are no herbicides cleared for establishing switchgrass.

Table 1. Influence of establishment practices on switchgrass seedling density, weight, and plant height.

Treatment	Density	Weight	Height
	no/ft^2	mg	in.
Autumn planting			
control	0.03 e†	*	2.0 cd
low-crown line	0.00 e	*	0.0 d
ryegrass-switchgrass	0.00 e	*	0.0 d
crimson clover-switchgrass	0.00 e	*	0.0 d
Spring planting in winter crop stubble			
winter weeds, Roundup 1 qt/a	0.55 de	*	13.0 b
rye stubble	0.35 e	*	4.7 c
crimson clover stubble	0.05 e	*	9.4 b
Spring planting, prepared seedbed			
control	2.23 bc	173 bc	25.0 a
low-crown selection	2.35 bc	232 ab	24.4 a
hand weeding	2.98 ab	224 ab	24.0 a
methyl bromide	3.90 a	267 a	25.8 a
lime 2 ton/acre	1.88 bc	154 c	24.2 a

†Values in a column followed by the same letter are not significantly different at 0.05 level, Waller-Duncan MRT.
*Five plants/plot not available to determine seedling weight.

Table 2. Influence of planting method on prepared seedbed on switchgrass seedling density, weight, and plant height.

Treatment	Density	Weight	Height
Spring planting	no./ft^2	mg	in.
broadcast seed	0.78 bc†	82 a	19.5 a
drill seed	2.03 a	117 a	20.2 a
roll, broadcast seed	0.30 c	68 a	16.7 a
roll, drill seed	1.85 a	104 a	18.2 a
roll, broadcast seed, roll	0.60 c	76 a	15.0 a
roll, drill seed, roll	1.65 ab	143 a	19.3 a

†Values in a column followed by the same letter are not significantly different at 0.05 level, Waller-Duncan MRT.