Switchgrass Seed Treatment, Seeding Rate and Seeding Date Study in New York

Challenge: Establishing switchgrass can be difficult in comparison to conventional field crops. This project investigated seed treatments, seeding rates and seeding dates so that producers can establish successful stands of switchgrass. One trial was on a Steuben County farm and several trials were at Cornell Ag. Experiment Station in Tompkins Co.

Choosing Seed: Seed of switchgrass is purchased on a ‘pure live seed’ (PLS) basis. In most seed lots, some percentage of the pure live seed is dormant and will not germinate in the seeding year. Producers should try to buy seedlots of switchgrass that have the highest germination with low percentages of dormant seed. This germination information is available from the seed companies and varies by seedlot. For this study, the seedlots had 0% dormant seed.

Seed Treatments: Some seed was treated with an insecticide and three fungicides as a seed coating and some seed was not treated.

<table>
<thead>
<tr>
<th>Variety</th>
<th>Seeding Rate (lbs PLS per acre)</th>
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<tr>
<td></td>
<td>Low</td>
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<tr>
<td>Blackwell</td>
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<td>Kanlow</td>
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Choosing Varieties: Two varieties were used for these studies. Blackwell is an upland ecotype and grows well in all of New York State. Kanlow is a lowland ecotype and is winter sensitive so should be grown in USDA Plant Hardiness Zones 5a to 8b.

Seeding Rates: Seeding rates were “low” (36 seeds/ft²), “medium” (72 seeds/ft²) and “high” (108 seeds/ft²). Seeding rate varied by variety since Kanlow seed is half the size of Blackwell seed. Each plot within a seeding rate and seed treatment was planted with the same number of seeds.

Seeding Dates: The trials in Ithaca were planted on June 15, July 20, and August 30, 2012, and May 14, 2013. The Steuben Co. trial was planted on June 20, 2012.
**Results:**

**Establishment:**

**Steuben County (Avoca):** Producer John Savoca prepared an excellent seed bed. It was firm and smooth, so that the Blackwell seed planted at the low, medium and high rates all established very well and averaged 9 seedlings/ft² in early August. Rain was adequate in Steuben County that summer. The treated seed and Kanlow seed were not planted at Mr. Savoca’s farm.

**Tompkins County (Ithaca):** The first two seeding date trials (June and July 2012) were planted under drought conditions and averaged 8 seedlings/ft². The last two plantings (August 2012 and May 2013) had adequate moisture and averaged 23 seedlings/ft². Some weed pressure was present in 2012, but Roundup was applied in spring 2013 before the switchgrass started to grow.

Overall in Ithaca, the treated seed plots averaged 17 seedlings per square foot compared to 14 for untreated seed. The low seeding rate plots averaged 9 seedlings/ft², the medium rate averaged 16 seedlings/ft², and the high rate averaged 25 seedlings/ft².

**Winter Survival and Yield - First production year:**

In general, yields in the first production year are about 60% of what would be expected in later years, after the plants are well established. Thus yields as presented are lower than what are expected in 2014 and beyond. For the trial planted on June 15th 2012 under drought conditions, the treated seed plots yielded more than the untreated seed plots (2.6 vs 2.2 tons per acre). Also, Kanlow yielded more than Blackwell (3.0 vs 1.9 tons per acre).

The highest yielding seeding rate for Blackwell was the medium rate (8 pounds per acre, 72 seeds/ft²) and for Kanlow was the high rate (6.6 pounds per acre, 108 seeds/ft²). For the trial planted in July, the Blackwell plots were damaged but survived the winter while the Kanlow plots were a complete loss. For the trial planted in August, both varieties died as the result of a severe early frost.

**Conclusions:**

Planting treated seed at 7-8 pounds per acre or about 70-110 seeds/ft² is a best management practice for establishing switchgrass in New York. Seedings from early-May to mid-June are likely to be most successful with adequate weed control and moisture. Seeding later than June 30th is risky and may result in stand loss from winterkill and frost heaving. Seeding Kanlow is a risk, particularly in areas colder than Plant Hardiness Zone 5a, but Kanlow is a more productive variety than Blackwell. Switchgrass improvement programs are developing lowland varieties adapted to New York. For a full report of research results contact J. Hansen at JLH17@cornell.edu.

For more information about switchgrass establishment and management visit:

- [http://forages.org/bioenergy/](http://forages.org/bioenergy/)
- [http://nmsp.cals.cornell.edu](http://nmsp.cals.cornell.edu)


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