

Growing Switchgrass and Miscanthus for Horticultural Mulches.

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A few strawberry growers in Ontario applied switchgrass and miscanthus as their straw mulch on strawberries in 2017. The goal of this trial is to evaluate the winter insulation and weed control miscanthus and switchgrass provide compared to wheat straw. The straw is being taken off now, and we will evaluate the overwintering survival and weed control this spring.

Once growers heard about the different straw options there was interest in producing switchgrass and miscanthus. Mahendra Thimmanagari, OMAFRA’s Bio-products specialist, has provided information addressing frequently asked questions about growing switchgrass and miscanthus.

Question	Switchgrass	Miscanthus
<p><b>Site Selection</b>  <b>Q. What are the best soil types? Specifically, how would they perform on a sandy soil with no irrigation?</b></p>	<p><b>A:</b> Switchgrass has been successfully grown on prime agricultural land and on more marginal class 3 soils that are stony, gravelly or relatively shallow. Marginal Class 3 lands in Ontario can be a good choice for switchgrass. Switchgrass is easiest to establish on well-drained soils that have previously been used for annual cropping.</p> <p>Switchgrass seed is fairly small and seeds can have great difficulty emerging on heavy clay soils</p>	<p><b>A:</b> Miscanthus grows best on Class 1, 2, or 3 soils. Miscanthus has been grown on Class 4-5 soils but there is a greater risk of poor stand establishment and lower yields.</p> <p>Fields that are prone to excessive standing water should not be considered for miscanthus.</p> <p>Fields that are high in sand content, particularly in colder regions, should also be used with caution, as there is the possibility of frost penetrating into the rhizome-growing region.</p>
<p><b>Q. How to prepare the soil.</b></p>	<p><b>A:</b> Soil preparation should typically include one or two secondary tillage passes followed by packing or cultipacking. Packing the soil before and after planting is highly recommended on all soil types.</p>	<p><b>A:</b> Select sites that have low weed pressure, especially from perennial weeds. An herbicide burn-down using a non-selective herbicide such as glyphosate in the fall before planting can help reduce pressure from winter annuals and biennial weeds</p>
<p><b>Crop establishment</b>  <b>Q. When is switchgrass/miscanthus planted?</b></p>	<p><b>A.</b> Switchgrass is seed propagated. It is best to seed when soils are relatively warm and the risk of frost has passed,</p>	<p><b>A.</b> Miscanthus reproduces through rhizomes. Establish miscanthus fields around the same time as optimal corn</p>

	generally between May 10 and June 10. Seed will germinated at 10°C but seedlings grow best when soil temperatures reach 18°C. Early seeding is preferable to reduce the risk of hot, dry weather after planting. Late seeding should be avoided.	planting date in your region. Planting too early can be detrimental because it may increase weed competition. Rhizomes only begin to grow when soil temperatures are sufficiently warm and can take up to 3 weeks to emerge
<b>Q. What are the seeding rates?</b>	<b>A:</b> A seeding rate of 8-10 kg/ha of pure live seed (PLS) is recommended when sowing Cave-in-Rock. Use a higher rate of 12 kg PLS/ha in more marginal field conditions or where producers choose to establish the crop without herbicides.	<b>A:</b> Rhizome planting density will depend on rhizome quality and equipment availability. The desired final population should be between 10,000–12,500 plants/ha (4,000–5,000 plants/acre). Many producers incorporate a 25% rhizome mortality rate into their planting plans. This means that desired final population should be between 10,000–12,500 plants/ha (4,000–5,000 plants/acre). Higher planting densities of up to 25,000–30,000 rhizomes/ha (10,000–12,000 rhizomes/acre) are recommended in order to achieve a higher stem density by the second and third year.
<b>Q. What is the cost of seed or rhizome per acre?</b>	<b>A:</b> \$75.00/acre (seed 10 lbs/ac @ \$7.50/lb)	<b>A:</b> Establish with rhizomes or tissue culture transplants. Miscanthus reproduces vegetatively through rhizomes. Rhizomes cost 15-20 cents/rhizome.
<b>Q. What is the estimated straw yield per acre?</b>	<b>A:</b> In Southern Ontario farmers are achieving dry matter yields of 7-12 t/ha (3-5 t/ac).	<b>A:</b> Growers have reported spring-harvested dry biomass yields of 17-26 t/ha (8-12 t/acre). Aiming for 22 t/ha is a good goal for Ontario producers.
<b>Q. What varieties are recommended/available?</b>	<b>A:</b> Cave-in-Rock is the most popular cultivar of switchgrass currently grown in Ontario. New varieties have been developed from REAP Canada and are in the process of being commercially available.	<b>A:</b> Miscanthus varieties were selected based on biomass yield potential, good cold tolerance in the growing region and standability in regards to the risk for summer or winter lodging.

<p><b>Harvesting</b>  <b>Q. When to harvest crop?</b></p>	<p><b>A:</b> Most farmers in Ontario will mow the crop in late fall, allow it to overwinter in the fields in a swath and bale early the following spring. By spring, the crop is typically baled at 8-12% moisture. This also reduces the risk of volunteer growth from seeds when using the straw for mulch.</p>	<p><b>A:</b> Miscanthus is typically not harvested in the establishment year, as the plants are still in a juvenile stage of development, biomass yield is low and harvesting is not economical. In the second year, the miscanthus harvest window commences 2 weeks to a month after a killing frost in the fall and up until the resumption of growth in the spring</p>
<p><b>Q. What is the lifespan of Switchgrass and Miscanthus?</b></p>	<p><b>A:</b> Switchgrass can have great longevity, with some stands in Eastern Canada exceeding 15 years of production. However with the emergence of new higher yielding cultivars and new insect and disease challenges as acreage is scaled up, most farmers will likely be choosing to grow the crop in rotation cycles of 5-8 years.</p>	<p><b>A:</b> A stand of miscanthus can remain productive for more than 20 years</p>

For more information on seeding depths (switchgrass), planting equipment needs, seed sources, moisture needs, fertilizer, herbicides, harvesting equipment, pest considerations and more visit:

[Using Switchgrass and Miscanthus in Mulching Applications](#)

[A Comprehensive Guide to Switchgrass Management](#)

[Switchgrass Agronomy](#)

[Miscanthus Agronomy](#)

[OMAFRA's Specialty Croppportunities](#)

Or go to [ontariobiomass.com](http://ontariobiomass.com) and find these resources under the 'Agronomy Guides, Videos and Grower Info' page.