Alternative Forages to Silage Corn

Silage corn is grown to provide energy and fibre in a ration. It has very high yield potential. In addition to breaking corn rootworm lifecycles, alternatives to silage corn need to offer similar yield and nutritional value (Table 1). **Producers should consult a livestock nutritionist to ensure rations are properly balanced.**

Table 1. Typical nutritional quality and yield of some annual forage crops

Crop	Protein (%)	NDFd (48 h)	TDN (%)	Yield Potential (tonnes DM/ha)
Silage corn (no corn rootworm injury)	6-8	55-68	66-72	12.4-15.6
Winter cereal (late boot to early head)	16.1-16.5	57-73	60-64	5.0-9.0
Sorghum-sudangrass	8-17	50-60	56-70	8.0-12.0
Italian ryegrass	20-23*	70-80	69-72	6.0-8.5
Westerwold ryegrass	-	-	-	8.0-12.0

*when fertilized with enough nitrogen

Neither winter cereals nor sorghum species are host crops for corn rootworm. Double cropping these two species is the easiest way to achieve comparable yields to a silage corn crop that does not have rootworm injury.

Yield potential of fall rye is maximized when seeded on the optimum seeding date for winter wheat <https://fieldcropnews.com/2019/08/optimum-planting-dates-for-winter-wheat-in-ontario/> . However, rye can be successfully established after silage corn harvest. Where available and conditions permit, apply manure ahead of seeding. Seed at a rate of 110 kg/ha (100 lbs/acre) and at 2.5 cm (1 in.) depth, or deeper to seed into moisture. For fertility guidelines, see Chapter 4 of OMAFRA Publication 811: Agronomy Guide for Field Crops. Remember to account for nutrients from manure when calculating fertility requirements.

Apply 55-80 kg/ha (50-75 lbs/acre) of nitrogen at green-up in the spring to encourage tillering and increase forage yields. Rye should be harvested between flag-leaf and early boot stage for high-quality forage. In southern Ontario this typically occurs between May 10-20. Cut the crop at the optimum maturity stage and wilt to the target moisture for ensiling or baleage. If the rye shows signs of regrowth, a burn-down to terminate the crop will prepare the field for seeding sorghum-sudangrass.

Winter triticale can be substituted for fall rye. Seeding rates and fertility requirements are the same. Triticale is typically ready to harvest 10-14 days later

than rye. Where rye or triticale harvest conflicts with planting other crops in the spring, harvesting the cereal should take priority to maintain quality.

Sorghum-sudangrass requires soil temperatures above 12°C to germinate, so conditions to seed generally occur in the last week of May or early June in southern Ontario. Where available and conditions permit, apply manure ahead of seeding. Seed at a rate of 33-44 kg/ha (30-40 lbs/acre) and at 2-4 cm (0.75-1.5 in.) depth. Use the phosphorus and potassium guidelines for corn (see Chapter 1 of OMAFRA Publication 811: Agronomy Guide for Field Crops). Remember to account for nutrients from manure when calculating fertility requirements. Apply 80-100 kg/ha (90-110 lbs/acre) of actual nitrogen up front, and 50 kg/ha (45 lbs/acre) after first cut.

Sorghum-sudangrass is a two-cut crop. It should be harvested before heads emerge, which is typically about 60 days after planting. At cutting, the crop is about 70-75% moisture and requires wilting before ensiling or making baleage. It dries slower than alfalfa. To encourage regrowth, leave 10-18 cm (4-7 in.) of stubble when harvesting. A second cut is typically ready 30-35 days after the first cut. Ensure that the crop is at least 65 cm (26 in.) tall before cutting. Wait for some regrowth, then terminate the sorghum-sudangrass with glyphosate to prepare the field to go back into rye.

Another option to replace silage corn is an annual ryegrass, either Italian or Westerwold. Italian ryegrasses have a vernalization requirement like winter cereals, so they do not head out the year they are planted. Westerwold ryegrasses are more like spring cereals in that they will head out in the establishment year. While both are highly palatable to ruminants, they may be an alternate host for corn rootworm. To prevent rootworm populations from surviving on ryegrass and "bridging" between corn crops, ryegrass should either be followed by a non-host crop or grown for at least three years before rotating back to corn.

Seed ryegrasses at 30-40 kg/ha (27-36 lbs/acre) and 6-12 mm (0.25-0.5 in.) depth. Where available and conditions permit, apply manure ahead of seeding. Phosphorus and potash fertility are the same as for perennial forages (Chapter 3 of OMAFRA Publication 811: Agronomy Guide for Field Crops). Ryegrasses have very high nitrogen demands, so apply 55 kg/ha (50 lbs/acre) up front, and again after each cut except the last one of the year.

All these options lose quality and palatability very quickly if harvest is delayed. These alternative forages can be seeded and harvested with conventional forage equipment.

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