

# EMERGENCY HAY AND SILAGE FORAGE CROPS

**Forage Fact Sheet #19-03**

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Forage shortages can be good news for growers who are able to harvest because prices may be strong, but are bad news for those unable to harvest. Many dairy and livestock producers who purchase forage are already facing tight cost margins, and failure of usually dependable forage crops like corn silage and alfalfa due to weather conditions puts them in a bind because animals must still be fed.

Wet and cool seasons present challenges to the Michigan forage supply. On top of the extensive alfalfa winterkill across many parts of the state, problems include delayed planting of annual forages like corn silage, forage soybean, annual grains or peas; water damage to established alfalfa or new seedlings; slow growth of perennial forages because of cold and cloudy weather; wet soils leading to delays in haylage harvest or pugging in pastures; poor hay drying weather; poor nutritional quality of over-mature, late-harvested hay; and limited seed supplies for alternative forages.

## **SELECT THE BEST EMERGENCY FORAGE**

To select the best emergency forage, consider the cost, seed availability, forage quality suitable for the animal to be fed, harvest type, and harvest timing to best meet farm goals.<sup>1</sup> Seed availability, sourcing, and price become limiting issues when large numbers of producers are scrambling to

purchase alternative seed. In this fact sheet, MSU Extension gives a brief overview of options intended for use as dedicated forage crops, with links to sources of more detailed information.

## **HARVESTED COVER CROPS**

Because of the critical forage supply situation in 2019, Risk Management Agency (RMA) has issued a one-year exception allowing forage harvest after Sept. 1 on prevented planting acreage seeded with cover crops after the cutoff dates. However, use of this option puts restrictions on forage management that do not exist when emergency forages are grown on non-insured acreage. If you are considering doing this, check with your crop insurance agent first to make sure it fits within your specific crop insurance contract. Also check with your cover crop cost-share program if you are in one. Keep in mind that cover crops are often planted for different reasons and



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under different management than a dedicated annual forage of the same species. Cover crops are usually planted at different seeding rates than dedicated forages with closer row spacing, receive less or no fertilizer, and do not receive pest control treatments for weeds, insects, or diseases. Cover crop field surfaces may be rough and not ideal for hay cutting equipment or silage choppers. Therefore, you should not expect optimum forage yields and quality from harvested covers. When using corn or soybeans as cover crops, check with your seed supplier to make sure seed stewardship requirements are met. Many herbicides used in production of row crops, especially soybeans, have long soil residuals (up to 18 months) that may prohibit use of a cover crop as forage on prevented planting acres. Make sure you read the label carefully for any pesticide restrictions on a prevented planting field.

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## CORN SILAGE

Late planted corn silage<sup>2</sup> will not produce as much yield and quality as corn silage planted on a normal timing, but it will still likely be a greater yield than can be obtained from the alternatives. Results from a study conducted in Michigan, Wisconsin and Minnesota to compare forage yield and quality of emergency forages indicated that corn was usually the highest tonnage option even when planted as late as July 1. Corn seed has the additional advantage of being readily available and possibly already purchased. For extremely late planting after July 1, use a long season variety. This is because whole corn plant digestibility slumps between the V12 and R5 stages. If corn is planted so late that it will not have time to mature past R5 before frost, it is better to plan to harvest it close to V12. Rations will need to be adjusted for the reduced silage starch and energy value that will result if ears do not have time to mature. MSU Extension provides some guidelines for pricing immature corn silage.<sup>3</sup> Silage harvest may need to be later than usual to allow proper moisture content, and this further increases risk that the corn will be frosted<sup>4</sup> before it can be harvested. Immature, frosted corn silage can still be harvested with proper precautions.

## SORGHUM, SUDANGRASS AND HYBRIDS

Sorghum and sudangrass are related annual warm-season grass species that can interbreed to produce hybrids which are often referred to as sudex. In this reference, they are referred collectively as sorghum species. Sorghum species require a minimum soil temperature of 60-65 degrees F at planting. Chilling injury resulting from planting into colder soil can cause seedlings to fail or permanently stunt seedlings. The earliest planting date for sorghum<sup>5</sup> species in Southern Michigan is June, with later dates required in Northern Michigan. The late planting date makes these a tempting option when corn planting is delayed because a missed corn planting window sets up a perfect planting window for the sorghum family. The challenge is that sorghum family forages do best in hot weather and are always a gamble in Michigan because summers do not reliably provide enough heat units. When night temperatures drop below 50-60 degrees, sorghum growth will be impaired. Also, the growing season for sorghums in Michigan is shorter than in southern states because these crops are killed outright by frost. As a result, do not expect Michigan forage yields to match those published from more southern locations even under the best conditions. Yields of 3-5 dry tons/acre can be expected in Michigan, with better yields under the best conditions only. Forage sorghum typically provides only one cutting, but sudangrass and sudex can be cut more than once. The forage quality of a good forage sorghum crop is typically described as 80% of corn silage. Brown-midrib varieties have better digestibility than ordinary sorghum varieties, but typically yield slightly less. New brachytic dwarf sorghum varieties are shorter than normal varieties, but have thick stalks, higher sugar content, and the same number of leaves, giving them equivalent yields with good quality.

Sorghum forages can contain toxic levels of both prussic acid and nitrate.<sup>6</sup> Prussic acid is a natural component of the plant with concentrations greater in younger shoots. Levels are greater in sorghum than in sudangrass, with sudex intermediate. Prussic acid dissipates to non-toxic levels in well-cured hay and well-fermented silage. Most poisoning cases occur on pastures when livestock are grazing sorghum shorter than 18 inches, or after a frost when wilted sorghum pasture is particularly dangerous. Nitrate can accumulate to toxic levels in forage sorghum any time the crop is grown under high nitrogen fertility with slow plant growth. Most producers know this can happen during drought, but it can also occur during cool, cloudy weather. High nitrate levels are not affected by drying as hay, but can be reduced about 50% by ensiling.

## MILLETS

Millets are group of warm-season annual forages with management requirements generally similar to the sorghum family.<sup>7</sup> Millets do not contain prussic acid, but have the same nitrate risk as the sorghum family. A good stand of pearl millet will produce plants with relatively fine stems and profuse leafy growth. Pearl millet has a significantly higher leaf to stem ratio than sudangrass, sudex and foxtail millet. Average yields for millet managed as a cover crop were 2.35 DM tons/acre and yielded the greatest amount in a single cutting system. Millet managed as a forage in a one-cut system (50 lbs. N/ac) planted on July 1st in Wisconsin yielded between 2-8 DM tons/acre, sometimes yielding more than corn silage. German foxtail millet planted in June in Michigan (75 lbs. N/acre) yielded 6.7 tons/acre in East Lansing but only 2.6 tons/acre in Lake City. Relative forage value of millet is less than forage soybeans and alfalfa, but comparable to small grains and other warm season grasses.

## TEFF

Teff grass, sometimes called lovegrass, is a summer annual warm-season grass that is growing in popularity as a high-value annual hay crop.<sup>8</sup> It requires a warm soil at planting and is therefore good for late planting situations, giving harvestable yields in as little as six weeks after planting. If planted in June in Southern Michigan, it may total 5 ton/acre over two to three cuttings before it is killed by the first frost. Later planting dates or more northern locations can expect lower yields and fewer cuttings. Teff seed is tiny, and fine, firm seedbed preparation is essential to success. It is said that you should be able to bounce a basketball on a properly prepared teff seedbed right before planting.



## SMALL GRAINS WITH OR WITHOUT PEAS

The spring window for planting small grain (oats, triticale, rye, wheat, barley) forages in Michigan is April to May, with a second opportunity in late July to mid-August. For best forage quality, small grains should be cut no later than boot stage. Oats are the fastest maturing species for the late summer window and will reach boot stage about 45-60 days after planting.<sup>9</sup> If this can be timed to coincide with the first fall frosts, sugar content of the crop can reach 18%, which is extremely high energy forage. Field peas are a good option to add protein to a small grain mixture but do not usually increase yields.<sup>10</sup> If overwintering is desired, Austrian winter peas have better cold tolerance than field peas. Research conducted in 2018 comparing pea, oat and triticale combinations in the Upper Peninsula saw a yield ranging from 1-3 dry matter tons/acre.

A pea and triticale mix yielded a more nutrient dense forage but a pea and oat mix produced more tonnage. An pea/oat mix planted as late as early August in East Lansing had similar forage yield (-1.0 ton/acre) to sudex and sudangrass but better forage quality. Spring triticale is an option for fall-harvested forage in this late window also, because early growth is faster than winter triticale. If harvest is not targeted until the following spring, plant a winter triticale, rye, wheat, or barley instead. Rye will typically yield

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slightly more forage than other small grains, but with reduced forage quality. Oats will not overwinter in Michigan. Triticale and forage rye harvested at boot stage in Southern Michigan can provide up to 3.5 tons DM/acre several weeks before anything else is ready in the spring.

## ANNUAL CLOVERS

Recent MSU research indicates that berseem clover is a good emergency legume forage in southern to mid-Michigan, producing up to 1.3 tons DM/acre from mid-summer plantings in East Lansing and Lake City. Crimson clover forage yields were similar to berseem in East Lansing, and greater (1.7 ton/acre) in Lake City. Annual legumes did not yield well in Chatham. Annual legume forage quality was comparable to red clover.

## FORAGE SOYBEANS

Soybean seed is readily available in 2019, and can be used to grow soybeans for forage as long as seed treatments and stewardship agreements do not preclude feeding resulting forage to livestock.<sup>11</sup> The University of Wisconsin has a useful guide to forage soybeans which is applicable to Michigan growing conditions. That research concluded that using standard grain varieties had comparable yields but greater forage quality when compared to the forage

types. It is recommended to select a variety that is slightly later maturing than what you would plant for grain on a given date. Use these late-planted soybean recommendations for grain when selecting varieties for forage.

## REFERENCE

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