

ALTERNATE FORAGE CROPS

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Farmers have two reasons for asking about alternate crops. The first is for use as an emergency forage when stands or new seedings of perennial forages fail and the second is as a long term alternative to alfalfa or corn silage.

Before beginning this paper, we should put things into perspective by stating that alfalfa and corn silage are the best choice, in most cases, for long term production of high quality, high tonnage harvested forage. Except for the very northern portions of Wisconsin, alfalfa will generally produce the most protein per acre, fix nitrogen and have the lowest erosion while corn silage will generally produce the most tonnage. In northern portions of Wisconsin, red clover/orchardgrass or tall fescue mixes are often most productive.

While grasses can produce high quality forage in grazing systems, they tend to be high in fiber when allowed to grow to mature for higher yields for harvest as hay or haylage. The high fiber will restrict animal intake in dairy rations.

The alternatives available for harvested forage tend to be annual crops (table 1). The first portion of the table, covering small grains, is listed in order according to when the crops would normally be harvested for forage. Yield and quality values are intended to represent average occurrences to allow comparisons among forages. It should be recognized that yields on individual farms in individual years may be more or less than shown in the table depending on management and weather conditions. All yields are expressed as dry matter tons/acre. **Note this especially when intended use is for silage** (divide dry matter yields by 0.35 to convert to tons silage at 65% moisture). Yields are estimated for southern Wisconsin under high management and should be adjusted accordingly for other regions. Crude Protein is expressed on a dry matter basis. For crops where more than one harvest is likely, only the date of the first harvest is listed.

Small grains should be harvested at boot stage (head beginning to emerge from leaf whirl) for milking dairy cattle and at early heading for other categories of animals. The same is true for small grains seeded with peas. Small grains are definitely cool season crops and have greatly reduced yields when planted later (than early May) in the spring or over summer. Fall plantings tend to produce little forage in the seeding year. We would not recommend late summer seeding alfalfa under the small grains. The cover crop will slow down development of alfalfa and increase risk of winterkill.

Seeding a mixture of spring oats and winter wheat in the fall will allow for forage harvest in October (primarily oats) of the seeding year and again in the spring (winter wheat).

Small grain-field pea mixtures have gained popularity as an emergency crop. Primary

benefit of peas mixed with small grains is to improve quality; yield effects are variable ranging from 0 to 0.5 t/a increases. Peas may be mixed with oats, triticale, or barley. Barley tends to be ready to harvest earlier than the other two species. There does not appear to be a best species - the top yielding varieties of each species perform better than the poorer-yielding varieties of all other small grain species. Small grain-pea mixtures have wider harvest window than small grains by themselves. Increased forage quality has been observed with higher pea seeding rates up to 100 lb/A. However, diminishing returns and cost of peas suggest that the optimum seeding rate is 50 lb peas per acre with about 2 bu/a oats.

Corn should be harvested for silage at beginning at half milk line. Late planted corn should be frosted to dry down to 65 % moisture and harvested. Quality of corn silage is pollination (if near frost) is about the same as half milk-line.

Forage sorghum should be harvested for silage at milk stage. They will yield well in warm years and poorly in cool years. They would not be recommended north of Madison due to potential for cooler weather and reduced growth.

Forage sorghum, sudangrasses, and sorghum/sudangrass hybrids are better adapted than most species to drought, high temperature, water logging, and low soil pH, but will yield less in seasons with cool (less than 85°)Augusts and/or Septembers. Sudangrass and sorghum/sudangrass hybrids should be harvested at 2 to 3 feet of height (two to three cuttings for season). Harvesting at later maturity may increase yield but will result in very low forage quality.

Soybeans should be harvested at R7 stage (when first pods are beginning to turn color). The idea is to harvest just before beans have begun to form. Pods with beans formed will shatter during harvesting and result in quality loss. Further, soybeans harvested at R7 (without beans) ensile well but at later stages the forage with beans does not ensile well because of high oil content and should be mixed with a grass (e.g. corn, sorghum, sudangrass) at chopping to improve ensiling characteristics.

Table 1. Forage Planting Date, Harvest Date, Yield and Quality of Annual Forage Crops

Crop	Planting Date	Maturity Date	Yield (t/a)	Crude Protein	RFV ¹
Winter Rye	September	mid May	3-3.5	12-13	85-90
Winter Wheat	September	late May	3-3.5	11-12	85-90
Winter Triticale	September	early June	3-3.5	11-12	85-90
Barley	mid April	mid June	2.5-3	12-13	100-110
Barley & peas	mid April	mid June	2.5-3	15-16	115-120
Oats	mid April	late June	2.5-3	12-13	100-110
Oats & peas	mid April	late June	2.5-3	15-16	115-120
Wheat (spring)	mid April	early July	2.5-3	11-12	100-110
Triticale (spring)	mid April	mid July	2.5-3	13-14	100-110
Sp. triticale & pea	mid April	mid July	2.5-3	15-16	115-120
Corn (silage)	May 1	mid Sept	7-8	9-10	95-105
Corn (silage)	June 1	mid Sept	5-6	9-10	95-105
Corn (silage)	July 1	late Sept	2-3	9-10	95-105
Forage sorghum	June 1	mid Sept	6-9	10-11	90-100
Forage sorghum	July 1	mid Sept	2-4	10-11	90-100
Sudangrass	June 1	mid July	3-5	11-13	90-100
Sudangrass	July 1	mid August	2-4	11-13	90-100
Sorg.-sudan hybrid	June 1	mid July	4-6	12-14	90-100
Sorg.-sudan hybrid	July 1	mid August	3-5	12-14	90-100
Soybeans	May 15	July 1	1-1.5	20-21	120-140
Soybeans	May 15	August 1	1.5-2.5	18-20	120-140
Soybeans	May 15	Sept 15	3-4	18-20	120-140
Soybeans	June 1	Aug - Sept	2-3	18-20	120-140
Soybeans	July 1	September	1-2	18-20	120-140
Grain sorg. & soybean	June 1	September	6-7	11-12	95-110
Forage sorg. & soybean	June 1	September	6-9	10-11	90-105
Rape	mid June	September	2-3	20-25	150-250
Turnip - tops	mid June to Aug 1	September	2-3	20-25	150-250
Turnip - beet		October	0.5	16-20	-----
Oats (spring)	August	October	1-2	10-11	140-150
Barley (spring)	August	October	1-2	10-11	110-130
Triticale (spring)	August	October	0.5-1	13-14	130-140
Wheat (winter)	August	October	0.5-1	12-13	150-160
Mix (winter wheat & oats)	August	Oct & May	3-5	10-13	100-120

¹ Relative Feed Value, 100 equals fiber content of full bloom alfalfa