

Short Season Forages to Fill Supply Gaps for Dairy Farms

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Short-season forage species can provide supplemental forage for dairy animals in both warm and cool-seasons where gaps in the forage supply exist. Annual species can be selected for double-cropping options or combined in sequence to provide early, mid, and late-season forage. Yield and nutritive value from these forages is highly dependent on harvest management (Table 1).

Spring Plantings

Full-season corn silage should be the first choice because of its high forage yield and nutritive value. For shorter season forages, options include spring oat, spring triticale, or spring wheat planted early spring and harvested in mid-summer.

Late Spring to Early Summer Plantings

Short-season annual forages can be planted following a spring harvest of a worn out or winter damaged perennial forage or after a winter cereal forage harvest in spring (e.g., winter rye). Annual forages also can be relay intercropped (i.e. no-till interseeding) into a standing winter cereal crop where the annual forage is harvested later in early autumn after the cereal grain harvest in July. Forage options for planting alone in late spring include corn silage, sudangrass, sorghum-sudangrass, forage sorghum, soybean, and brassicas. Corn silage should be a top choice even when planted late because with adequate rainfall, it can produce more forage with greater feeding value than most summer annual grasses. Sudangrass, sorghum-sudangrass, pearl millet, and forage sorghum grow rapidly when planted in late spring and provide good nutritive value, especially if using sorghum varieties with the brown-midrib trait (lower lignin content). Pearl millet is essentially free of prussic acid poisoning potential, but the sorghum species have the potential for prussic acid poisoning. Nitrate toxicity is possible with all summer annual grasses, and management steps should be taken to reduce that risk.

Mixtures of summer-annual grasses and legumes, such as field peas and soybeans, are marketed by some seed dealers. The legumes increase protein content only in the first harvest because they don't regrow after cutting. Legumes increase the seed cost, so consider the benefit of including legumes versus supplementing with other protein sources.

Teff is a warm-season grass that can be used for hay, silage, or pasture. It produces several cuttings and can tolerate both drought-stressed and waterlogged soils. More details on managing this forage can be found in a factsheet from Cornell University (<http://nmsp.cals.cornell.edu/publications/factsheets/factsheet24.pdf>). Several forage brassica species (forage type turnip, rape, swede, kale) can be planted in May to early June for mid to late summer grazing (rape, turnip) or fall grazing (swede, kale). These species contain high moisture content, so they should be used for grazing only. Brassicas have very low fiber and high energy and should be treated more like a concentrate than as forage in diets.

Planting Mid to Late Summer

Summer annual grasses can be planted in mid-summer as soon as possible after a cereal grain harvest. Small grains (e.g., oat or spring triticale) and annual/Italian ryegrass can be planted a bit later for fall forage production. Forage turnips and rape can also be planted in mid-summer for fall grazing.

Late summer plantings of oat and spring triticale can produce good yields by mid-October when they will be in the boot stage or in November when they will be in heading stage. The crude protein (CP) content of the forage can be expected to increase 3 to 4 percentage units when field peas or soybeans are included in late summer planted mixtures. Field peas should be inoculated with N-fixing bacteria and sown in the mixture at 70 to 90 lb/acre. Soybean seeding rates for this application are not well-defined, but perhaps should be included at 60 to 70% of normal seeding rates.



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Annual or Italian ryegrass can also produce high quality forage when planted in late summer to be grazed in late autumn into early winter, followed by forage harvests or grazing the next spring into early summer. Some varieties have better winter survival than others, so check performance trials in your region. The forage quality of annual or Italian ryegrass will be at least equal to or higher than that of small grain forages.

Late Summer and Early Autumn Plantings

Double-crop plantings of spring oat, spring triticale, and annual/Italian ryegrasses can follow an early corn silage harvest. These later planting dates will produce lower yields and poor drying conditions persist when they will be ready to harvest in late autumn, so grazing or green chopping are better options than silage. Forage quality will be very high with CP between 20 to 32%, neutral detergent fiber (NDF) 30 to 38%, and NDF digestibility 75 to 85% in late autumn. If an early spring forage harvest is desirable the following year, Italian ryegrass should be used or mixtures of winter triticale and/or winter rye included with spring oat or spring triticale. The spring oat or spring triticale will produce fall growth, while the winter cereal will produce forage in the spring. Italian ryegrass will be ready for harvest in the autumn and the following spring.

Autumn Plantings

Winter wheat, winter triticale, and winter rye can be planted in autumn to produce high quality dry matter the following spring when harvested in late vegetative to boot stage. Wheat planting should be delayed until after the Hessian fly-safe date. Rye will grow and mature the quickest in the spring and must be managed to avoid over-ripening. Wheat and winter triticale are easier to manage because they mature later and more slowly than rye.

Agronomic Management

Plant high quality seed of a named variety to avoid unpleasant surprises. For mixtures of these small grains, the seeding rate of each component can be reduced to 70% of the full rate. No-till planting conserves moisture and provides firm soil conditions for harvesting equipment or grazing animals. A burn-down application of glyphosate is a cost-effective weed control practice prior to planting. When planted after wheat grain harvest, oat, spring triticale, or annual ryegrass will likely require 30 to 50 lb/acre of nitrogen at planting. Manure applications can replace some or all of the N fertilizer need, depending on the amount of readily available N in the manure. When growing Italian ryegrass, additional nitrogen (~50 lb/acre) will be needed in early spring and after the first or second harvest. However, when planting small grains or annual/Italian ryegrass for autumn forage after corn silage, be aware of the potential for nitrogen carryover from the corn. Depending on the rate of nitrogen applied to the corn silage, additional nitrogen applications may not be advisable. Excessive nitrogen

carryover from corn, coupled with additional nitrogen fertilizer applied to the new plantings, can result in toxic levels of nitrates in the forage produced in the fall.

Harvesting/Grazing Options

Chopping and ensiling or wet wrapping are the best mechanical harvest alternatives for these supplemental forages. Dry baling is a challenge, especially in the autumn, because the small grains dry about half as fast as grass hay. Ryegrasses are also slower to dry than other grasses. For early autumn planted forage, grazing provides the most effective and affordable alternative for utilizing the forage. Strip grazed through part of the winter can be an option for dry cows or heifers. Oats won't die until temperatures dip to the mid 20° F for several hours. Winter rye, winter triticale, wheat, and Italian ryegrass will survive even longer before going dormant.

Bottom Line: Double cropping annual forages offers many opportunities to produce and utilize supplemental forage within cropping systems. It increases the efficiency of land use while protecting the soil, which would otherwise sit idle and without cover for an extended period of time.

Additional DIBS are available on-line at <http://dairy.osu.edu>.

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Table 1. Guidelines for seeding rates, seeding dates, average yield, and nutritive value ranges for various annual forage silages. Yield and nutritive value ranges are for silage, which vary greatly with maturity stage at harvest. Generally for hay, expect lower CP and higher NDF concentrations.

Forage crop	Seeding rate (lb/acre)	Planting dates ¹	Dry matter yield (ton/acre)	CP (%)	NDF (%)
Corn silage	28-34k ²	4/20 - 6/15	5.0 - 9.0	6 - 9	38 - 50
Spring oat	75-100	3/15-4/15 or 8/1-9/7	2.5-3.5 or 0.8-3.0	10-16	52-65
Spring triticale	90-110	3/15-4/15 or 8/1-9/7	2.5-3.5 or 0.8-3.0	10-18	50-65
Winter rye	110	9/1-10/15	2.0-4.0 in spring	10-18	51-65
Winter wheat	110-120	9/22-10/13 ³	2.0-4.0 in spring	10-18	50-65
Winter triticale	110-120	9/20-10/10	2.0-4.0 in spring	10-18	50-65
Annual/Italian ryegrass	20-25	4/1-5/1 or 8/1-9/7	2.5-4.0 (spr. seeded) 3.0-6.0 (Fall+spring)	11-19	50-65
Forage sorghum	8-12	5/1-7/15	7.0-8.0	7-12	50-66
Sudangrass, sorghum-sudan	20-25	5/1-7/15	3.5-5.0	9-15	55-68
Pearl millet	15-20	5/1-7/15	3.0-4.5	8-17	56-67
Teff	4-5	5/15-7/15	2.0-4.0	13-16	55-65

¹ Planting date range for Ohio. In southern Ohio, the spring dates should be in the early range, and in the fall, they can be in the later range.

² 28,000 to 34,000 seeds per acre; seed companies provide hybrid specific planting rates.

³ Best to plant after Hessian Fly safe date, consult Ohio Agronomy Guide for dates by region.

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