

Growing successful late-summer and spring planted forage crops

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The decision to utilize late-summer planted forage crops as a feed source may be necessary when in-season crop yields fail to meet expectations or opportunities exist in the current crop rotation. One should evaluate the decision to plant and harvest late-summer planted forage crops carefully. The following steps can help determine your need and ability to plant late-summer planted forage crops.

1. Conduct a forage inventory (<https://livestock.extension.wisc.edu/files/2020/09/forage-inventory-and-needs.xlsx> (<https://livestock.extension.wisc.edu/files/2020/09/forage-inventory-andneeds.xlsx>)) to determine your forage needs including a reasonable estimate of known feeds yet to be harvested (e.g. corn silage, corn stalks, etc.).
2. Contact your crop insurance agent to determine if a late-summer planted forage crop affects your coverage.
3. Determine any potential restrictions as a result of herbicide or other crop protection products previously applied.
4. Consult your nutritionist to determine how the forage will be used in the ration.
5. Determine that a late-summer planted crop provides a return on investment (<https://cropsandsoils.extension.wisc.edu/article-topic/economics-budgets-financial/> (<https://cropsandsoils.extension.wisc.edu/article-topic/economics-budgetsfinancial/>)).

These are the major considerations for a late-summer planted forage crop:

1. Species Selection

Determine if you have fall or spring forage needs. Consider selecting a forage that will provide the level of quality desired for the animals being grown.

- Fall forage needs can be met by a late-summer seeded oats. Fall seeded oats are higher in quality than spring seeded oats: (<https://fyi.extension.wisc.edu/forage/fall-grown-oat-forages-cultivars-planting-dates-and-expected-yields/>)(<https://fyi.extension.wisc.edu/forage/fall-grownoatforages-cultivars-planting-dates-and-expected-yields/>)
- Warm season annuals (sorghum-Sudan grass) or forage cocktail mix for mid-October harvest. (<https://fyi.extension.wisc.edu/forage/sorghums-Sudan-grass-and-sorghum-Sudan-hybrids/>)(<https://fyi.extension.wisc.edu/forage/sorghums-sudangrassandsorghum-sudan-hybrids/>)
- Spring forage needs can be met by planting cereal rye or winter triticale for harvest. (https://fyi.extension.wisc.edu/forage/files/2017/06/Rye_090507_final-1.pdf)(<https://fyi.extension.wisc.edu/forage/fall-forage-rye-for-dairy-heifers-and-dry->



Boot Stage Cereal Rye – Dairy Quality



Mature Cereal Rye – Beef/Heifer Quality



Ensiling Spring Harvested Cereal Rye



2. Planting Date(s) and Potential Dry Matter (DM) Yields

- Late-summer seeded Oats/Oats and Peas should be planted in the northern half by August 10-15 or September 1 in the southern part of Wisconsin.
- Annual Warm Season Grasses (Sorghum-Sudan grass) or Cocktail Mixes should be planted by August 10 Northern, August 15 Southern.
- Cereal Rye and Winter Triticale should be planted for forage purposes ideally in mid-September – Oct. 1. Plantings can occur later, understanding yield potential will be lower.
- Yields of late summer planted forage crops will vary based on species, planting date, soil fertility, precipitation, growing degree days (GDD's) accumulated, and the stage of maturity.

Table 1. Late-Summer and Spring Planted Forage Options for Wisconsin

Crop	Planting Time	Harvesting Time	Yield Potential
Fall oats	Mid-August	Late-October	1-2 tons/acre
Fall oats and peas	Mid-August	Late-October	1-2 tons/acre
Sorghum-Sudan grass	Early-August	Mid-October	2-4 tons/acre
Winter cereal grain	Mid-Sept.	Mid-May	3-3.5 tons/acre
Spring oats	Mid-April	Late-June	2.5-3 tons/acre
Spring oats and peas	Mid-April	Late-June	2.5-3 tons/acre
Fall oats + Winter cereal grain	Mid-August	Late-Oct. & Mid-May	3-5 tons/acre
Forage brassicas	Early-August	Early-October	2-3 tons/acre
Italian Ryegrass	Mid-April/May	Late June	2.5-5.2 tons/acre
Italian Ryegrass-Legume Mix	Mid-April/May	Late June	2.5-7.5 tons/acre

Source: Steve Barnhart, retired ISU Extension forage specialist

Additional information at: <https://fyi.extension.wisc.edu/forage/alternative-forage-crops/>

3. Soil Test Levels and Plant Nutrient Needs

Spring Forages

Fertilization requirements, nutrient uptake, and removal with harvest vary by forage species and soil-test levels. Results from three Wisconsin studies for winter rye, rye and triticale, Italian ryegrass, and Italian rye-legume mixtures are shown in Table 2. Studies showed optimum N fertilization rates of 40 to 85 lb. N/a (per cutting) depending on the forage (Table 2). Removal rates did not vary widely between studies with 17 to 18 lb. PO/a, 81 to 84 lbKO/a, and 4 to 5 lb. S/a removed per ton of dry matter across all forages.

Summer forages

Fertilization guidelines and estimated nutrient removal with harvest for selected summer forages are shown in Table 3. Values shown in Table 3 are for soils with 2.0 to 9.9% soil organic matter and optimum soil-test P and K. Fertilization requirements are based on soil-test level and estimated removal. Fertilization planning for 2024 crops should consider removal of summer-planted forages in addition to guidelines provided by UWA2809. Soil sampling after forage harvest and planting subsequent crops is advised.



Table 2 shows dry matter yield, nutrient uptake (pounds per acre), and nutrient removal (pounds per ton of dry matter) for Wisconsin alternative forage studies.

Table 2. Dry matter yield, nutrient uptake, and nutrient removal averages and ranges of selected forage crops from Wisconsin studies.¹

Crop	Cuttings	Yield Range (ton per acre) ²	Opt. N Rates (pound per acre)	Nutrient Uptake (pound per acre)				Harvest Nutrient Removal (pound per ton dry matter)			
				N	P ₂ O ₅	K ₂ O	S	N	P ₂ O ₅	K ₂ O	S
Winter rye (forage) ⁴	1	1.3-3.9	74-81	121 (69-178) ³	42 (29-71)	178 (110-344)	-	52 (37-71)	18 (9-29)	80 (44-104)	-
Winter cereal forage ⁵	1	1.4-3.4	40-85	129 (61-210)	42 (26-61)	177 (101-269)	9 (5-14)	56 (38-70)	18 (16-21)	77 (16-21)	4 (3-5)
Italian rye-legume mix (per cutting) ⁶	3	0.9-2.5	50-75	87 (43-143)	28 (14-45)	137 (62-228)	8 (4-13)	54 (38-70)	18 (15-20)	84 (73-94)	5 (4-7)
Italian ryegrass (per cutting) ⁶	3	0.9-1.7	55-85	64 (34-90)	22 (13-28)	106 (64-142)	7 (4-9)	48 (40-61)	17 (15-18)	81 (75-88)	5 (4-6)

¹Yield, uptake, and removal represent instances when optimum fertilization was applied

²Dry matter

³Values are means across study with ranges in parentheses

⁴Stute, Shelley, Mueller, and Wood (2007)

⁵Jarek, Fulwider, Marzu, Ruess, Schuler, Shelley, and Jones (2023)

⁶Jones, Jarek, and Arriaga (2023); yield, N rates, and nutrient uptake values are per cutting.

Table 3 shows dry matter yield, nutrient uptake (pounds per acre), and nutrient removal (pounds per ton of dry matter) for Wisconsin alternative forage studies.

Table 3. Dry matter yield, fertilization requirement, and nutrient removal of selected forage crop groups.¹

Crop	Yield Range (ton per acre) ²	Nutrient Requirement (pound per acre) ^{3,4}			Harvest Nutrient Removal (pound per ton dry matter)	
		N	P ₂ O ₅	K ₂ O	P ₂ O ₅	K ₂ O
Small grain silage ⁵	2.0-3.5	40	30	120	11	44
Small grain and legume silage ⁶	2.0-3.5	15	30	120	11	44
Surghum-sudangrass	5.0-7.0	100	90	360	15	60
Rye, winter silage	2.0-3.0	60	50	220	18	80

¹UW A2809 Nutrient Application Guidelines for Field, Vegetable, and Fruit Crops in Wisconsin.

²Dry matter

³Nitrogen rates for soils with soil organic matter content between 2.0-9.9%. See UW A2809 for recommended rates at other levels.

⁴P₂O₅ and K₂O rates for optimum testing soils. See UW A2809 for recommended rates at other soil-test levels.

⁵Barley, oats, rye, triticale, or wheat

⁶Small grain with interseeded field pea or bean

4. 90-Day Precipitation and Temperature Outlook

NOAA (National Oceanic Atmospheric Administration) 90-day outlook maps: <https://www.cpc.ncep.noaa.gov/products/predictions/90day/> .(<https://www.cpc.ncep.noaa.gov/products/predictions/90day/>)

5. Weather Conditions at Harvest Time- Plan accordingly

- **Fall Harvest** – Short days and heavy morning dew may limit your ability to wilt forage to 60% moisture. Have a plan to segregate from other forages if needed.
- **Spring Harvest** –Spring weather conditions will influence your harvest timing. Monitor weather forecasts and patterns for planting of the next crop.