FORAGE BRASSICAS FOR SUPPLEMENTING PASTURE SLUMPS

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Beat the summer slump and late fall decline in food plots by planting forage brassicas. Forage brassicas are varieties of kale, rape, and turnip and can be grown in Michigan to supplement pastures during times of feed shortage.

Forage brassicas produce high-quality forage when harvested in a timely manner. Livestock eat stems, leaves and roots of turnips while just the stems and leaves of the rape. Above-ground parts of brassicas normally contain 20 to 25 percent crude protein, 65 to 80 percent *in vitro* digestible dry matter (IVDDM), about 20 percent neutral detergent fiber (NDF) and about 23 percent acid detergent fiber (ADF). The roots contain 10 to 14 percent crude protein and 80 to 85 percent IVDDM.

Turnip and other brassicas can provide grazing at any time during the summer and late fall, depending on the seeding date. The best use is for late fall grazing. The crops maintain their forage quality well into the fall, even after freezing temperatures. Our experience in Michigan has shown the best results by completing grazing of brassicas by early November. Brassicas can be grazed more than once if about 5 inches of stubble is left for regrowth. Grazing in the late fall is the last time the crop will be grazed as only a few plants will survive the winter.

Growing Requirements

Forage brassicas are a cool season crop. The crop can be planted any time from May until late July or 70 days before the first killing frost. The crop will usually be ready to graze about 65-75 days after planting. The crop grows best during periods of low temperature of 40 to 60 degrees F. Typical dry matter yields obtained in numerous university and farm trials are 3-5 tons per acre of dry matter.

Brassicas grow best on fertile, loam and slightly acid soils. The crop does not grow well on poorly drained soils with high clay content. Brassicas need a well-aerated soil.

Rape and turnip seed are small. The same care that is taken to plant alfalfa should be used to plant brassica seed. No-till seeding offers some benefits in that the sod maintains a better footing for livestock grazing the forage if wet conditions exist. Sods should be killed with a herbicide prior to seeding. Care must be taken to adjust the drill so seed is placed in contact with soil and pressed in with a press wheel. Advantages of seeding into a sod are fewer crop losses due to flea beetles and less soil erosion on sloping sites.

Turnip seed should be planted at 1.5 lbs per acre and the larger rapeseed at 3-4 lbs per acre. A final population of 5-6 plants per square foot is ideal.

Good soil fertility is essential for forage brassica growth. Brassicas are heavy feeders of nitrogen. If no legume or manure is plowed down or used, then 100 lbs. Nitrogen per acre should be applied. Phosphorus and potassium requirements are similar to small grains.

There are limited varieties to choose from. Table 1 lists varieties known to be available from various sources. Most varieties have been tested in Michigan and produce good yields. Seed of common dwarf essex rape and purple top turnip are the least costly; however, some of the more expensive hybrids maintain their leaf quality for a much longer period, especially under less than ideal conditions. Forage Star turnip has looked particularly good in several trials in Michigan.

Weed control should be done prior to planting the crop since there are no herbicides available once the crop is planted. Therefore, control grass with Roundup or emerged annual weeds with a burn-down herbicide such as Graxomone.

The crop is ready for grazing about 75 days after planting. It is best to start grazing at this time as delayed maturity can result in leaf losses due to fungal infections. Since the crop contains a high amount of water (88-90 percent), it should be pastured with supplemental hay. Supplemental hay should comprise about 30 percent of the animals' daily dry matter intake. This will provide enough fiber in the animals' diet. Animals should be gradually introduced to the crop to allow for development of the rumen microbial population that is adequate to digest the high levels of protein in the crop.

Some practical information on animal performance and observations from both on-farm and experiment station trials are given in Tables 2, 3 and 4.

Table 1. Seed Sources for Forage Brassicas

Seed Company & Address	Brassica Type
Kester's Wild Game Food Nurseries, Inc. PO Box 516, Omro, WI 54963 Phone: 414/685-2929 or 800/558-8815 Fax: 414/685-6727	Rape
Michigan State Seed 717 North Clinton Street, Grand Ledge, MI 48837 Phone: 517/627-2164 Fax: 517/627-7838	Rape
Peaceful Valley Farm Supply P.O. Box 2209, Grass Valley, CA 95945 Phone: 916/272-4769 Fax: 916/272-4794	Rape

Table 1. (continued)

Seed Company & Address	Brassica Type
Rupp Seeds, Inc. 17919 Co. Rd. B, Wauseon, OH 43567 Phone: 419/337-1841 Fax: 419/337-5491	Turnip
Rychner Seed Company Pettisville, OH 43553 Phone: 419/445-7661	Rape
Sexauer Seed Company P.O. Box 58, Brookings, SD 57006-0058 Phone: 605/692-6171 Fax: 605/692-4521	Rape
Southern Michigan Seed, Inc. 48580 CR 352, Decatur, MI 49045 Phone: 616/423-7051 Or: 265 South Sprague Street, Coldwater, MI 49036 Phone: 517/278-7333	Rape
Stanton Seed Company 3515 Jane Street, P.O. Box 2308 Saginaw, MI 48605 Phone: 517/752-8760 or 800/992-0044 Fax: 517/752-0878 Or: 1110 E. Steel, P.O. Box 132, St. Johns, MI 48879 Phone: 517/224-2308 Or: 321 Walnut Street, P.O. Box 481, Stanton, MI 48888 Phone: 517/831-5293 or 800/527-9130 Fax: 517/773-1216	Rape
Sweeny Seed Company 110 S. Washington Street, Mt. Pleasant, MI 48858 Phone: 517/773-5391 or 800/344-2482 Fax: 517/773-1216	Rape
Wolf River Valley Seeds N2976 County M, White Lake, WI 54491 Phone: 715/882-3100 or 800/359-2480 Fax: 715/882-4405	Rape, Turnip, Kale

Table 2: Brassica (turnip) vs. grass paddocks for fall grazing yearling heifers at MSU Lake City Farm, Lake City, MI

	Forage Treatment	
Item	Grass	Brassica
Number of heifers	15	30
Number of acres	6.5	6.5
Initial stocking rate, head/acre	2.3	4.6
Number of days	28	28
Initial weight (lb.)	1156	1144
Final weight (lb.)	1208	1188
Gain/head (lb.)	52	44
Average daily gain (lb.)	1.86	1.57
Number of acres actually grazed	3.25	3.25
Actual stocking rate, head/acre	4.6	9.2
Gain/acre (lb.)	240	406
Hay DM disappearance/head (lb.)	334	239
Hay DM disappearance/head/day (lb.)	11.9	8.5

Table 3: Brassica (turnip) paddocks for fall grazing Holstein steers at MSU Kellogg Biological Station Farm, Hickory Corners, MI.

Item	
Number of steers	10
Number of acres	1.5
Stocking rate, head/acre	7
Number of days	28
Initial weight (lb.)	875
Final weight (lb.)	928
Gain/head (lb.)	53
Average daily gain (lb.)	1.9
Gain/acre (lb.)	353
C protein turnip tops (%)	18.2
C protein turnip bulbs (%)	13.2
TDN turnip tops (%)	70
TDN turnip bulbs (%)	85
Turnip yield (dm t/acre)	3.5

Table 4: Brassica (turnip) paddocks for fall grazing Holstein cows at Kim and Ron Fulcher Farm, Gladstone, MI.

Item	
Number of Holstein cows	22
Number of acres	5
Stocking Rate (head/acre)	4
Number of days	30
Milk wt/herd percent gain	14
Average Bfat, initial	2.99
Average Bfat on Turnips	3.30
Average Protein, initial	2.88
Average Protein on turnips	3.30
Average yield of turnips (tons/acre dm)	4.2
C Protein of turnip tops	14.8
C Protein of turnip bulbs	13.7
Total digestible nutrients – tops (%)	65
Total digestible nutrients – bulbs (%)	80

Utilization of Turnips for Year-Round Grazing

Turnips can be planted at different times of the year and with various companion crops. The purpose of this chart is to provide some options on how turnips may be used for different seasons, different animals, and different uses.

Turnips	**Planting rate #/Ac**	**Benefits**	**When to plant**
Appin Forage Grazing Turnip	2-5	Multiple grazings, multiple uses for Beef, Dairy, and Sheep	Spring, Summer, Fall
Purple Top Turnip	2-5	Some grazing, good bulb yield, good for sheep	Spring, Summer, Fall
Tankard Turnip	2-5	Some grazing, excellent bulb yield	Summer, Fall
Spring Planting Companion crops			
Annual Ryegrass	30-40	Vigorous growth, excellent quality and palatability thru mid-Summer	Early March-thru April
Oats	3-4 bushels	Vigorous growth thru mid-Summer	Early March
Summer Planting Companion crops			
Annual Ryegrass	30-40		Mid-August after wheat is harvested
BMR Sorghum-Sudangrass	30	Excellent palatability and animal production, **Appin Turnips** re-grow with sorghum-sudangrass	Sow when planting sorghum-sudangrass
Corn		Graze corn with Turnips or harvest corn and graze turnips and stover after harvest	Arial seed turnips into standing corn in late-August
Late-Summer Planting Companion crops			
Oats with Cereal Rye	1-Bu. Each with 5# Turnips	Oats provide fall growth with turnips while Cereal Rye provides spring growth	Arial seed turnips Aug 20-30 into standing corn or after corn silage is harvested
Annual Ryegrass	30-40# with 5# Turnips	Annual ryegrass provide excellent fall growth and spring growth is likely in many areas	Arial seed turnips Aug 20-30 into standing corn or after corn silage is harvested