Forage Brassicas

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Introduction

Annual forage brassicas can provide livestock producers with fast-growing, high yielding, quality fall pasture. Brassicas are a group of closely related plants, which include cabbage, cauliflower, kale, rape, radish, turnip, rutabaga and swede. They have been used extensively in Europe as livestock forage, especially by sheep, for at least 600 years. Brassicas tolerate temperatures down to -5 degrees C and are well adapted to the cool, northern parts of Canada. Forage brassicas grow best on well drained soils with a pH of at least 6.

Uses

The high quality of forage brassicas makes them an attractive forage option. Typically the crude protein content of kale and rape leaves ranges from 18 to 25 per cent and that of turnip and swede roots from 9 to 10 per cent.

Brassica crops are difficult to ensile because of their high water content, and wilt down is impractical. If they are ensiled, chopped hay, straw or dry barley can be added. However, seepage and packing problems may still occur.

Brassica forages are generally used for late fall pasture, but on occasion they are chopped and fed to reduce the wastage caused by livestock trampling the crop.

Species and Varieties

The three main species of forage brassicas used for late fall pasture are turnip, kale and rape.

Turnip
(*Brassica rapa* L.) This crop is known by several names including stubble, fall, white or Dutch turnip. Turnips have bushy tops and large white roots that are rich in carbohydrates. Many varieties can be grazed twice, once for top growth (near the end of summer) and then later for the roots. Turnip has a lower dry matter yield than rape or kale.

Kale
(*Brassica oleracea* convar. *acephala* L.) Marrowstem kale has very digestible leaves and stems, and grows to 5 ft (1.5 m) under cool, moist conditions. Dry matter yields of kale range from 4,500 to 7,100 lb/ac (5000 to 8000 kg/ha) in Alberta and grazing can begin in late summer.

Rape
(*Brassica napus* L.). There are two kinds of forage rape, a giant type which is leafy and upright and a dwarf type which is short and branched. The giant types are used for cattle and sheep pasture while the dwarf types are best suited for finishing lambs. The giant types of rape have higher yields and are more palatable than the dwarf ones. Dry matter yields of giant types grown under irrigation in Alberta are over 8900 lb/ac (10 000

kg/ha). Rape is usually ready to graze about eight weeks after establishment. Do not confuse forage rape with oilseed rape or canola.

Crop	Seeding Date	Seeding rate lb/ac (kg/ha)	Row Spacing in (cm)	N Fertilizer lb/ac (kg/ha)
Rape	late June - early July	2.5 - 3.5 (3-4)	12 - 28 (30-70)	70 - 90 (80-100)
Kale	mid-May - mid-June	2.0 - 3.5 (2-4)	6 - 28 (15-70)	70 - 105 (80-120)
Turnip	mid-May - mid-June	2.5 - 3.5 (3-4)	12 - 28 (30-70)	90 (100)

Establishment and Fertility

Forage brassicas should be established in the same manner as canola. Ensure that the seedbed is firm and do not seed deeper than 0.5 in. (1.5 cm) or alternatively, seed with a zero-till drill into pastures or grain stubble. The following table gives the basic seeding information for the different types of brassicas.

Seeding rates can be as high as 4.5 lb/ac (5 kg/ha) if a problem with weeds is anticipated. Seeding kales and turnips later than mid-June usually results in decreased yields. The later seeding dates for rape ensures that adequate forage is available in September.

Moderate levels of potassium and phosphorus are required and about 18 lb/ac (20 kg/ha) of sulphur is essential for productive growth. Under irrigation, adequate amounts of naturally occuring sulphur should be available in the water.

Management

Grazing of forage brassicas requires careful management. A diet of pure brassicas can cause livestock to develop haemolytic anaemia and goitre. The amino acid compound S-methylcysteine sulphoxide (SMCO) which accumulates in the plants during the season is responsible for both of these conditions. The copper, manganese and zinc contents of forage brassicas do not meet the dietary requirements of ruminants, so mineral supplements will be required. Iodine, iron and copper supplements help to prevent anaemia and goitre. Any mineral supplementation that is used should ensure that the calcium-to-phosphorus ratio in the feed does not exceed 7:1. In addition, a diet containing forage brassicas must be balanced with dry feed to maintain adequate fibre because of the low dry matter content of brassicas.

To prevent bloat, ensure that cattle are full before putting them on rape pasture for the first time. Lambs being finished on brassica pasture should also be fed grain while they are on pasture and for two to three weeks afterwards. Glucosinolates in the crop can cause metabolic problems and taint milk in dairy animals.

Livestock can suffer from rape poisoning if they graze stunted, low growing, purple brassicas. This occurs when the crop is grown under very wet conditions on poorly drained soils, inadequate amounts of fertilizer have been used or an early frost occurs.

Strip grazing with the use of electric fencing is recommended for brassica pasture, especially kale, to reduce trampling losses.

Although there are many management factors to consider, forage brassicas do provide producers with a high yielding, quality forage option at a time when most cool season grasses are not available.

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