

Stubble Turnip Variety Test: 1999 Yield Data
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Stubble turnips are a root crop used for fall and winter pasture for sheep. They are commonly grown in parts of the United Kingdom and in New Zealand and have gained popularity in parts of the USA, notably Michigan. The use of stubble turnips in Ontario is quite limited at present.

This study assessed the yield of tops and roots from five varieties (Table 1). Each variety was sown in plots 1.5 m wide by 6.1 m long and replicated four times. Plots were drilled on June 28, 1999 at 4 kg/ha in 18 cm rows. Nitrogen was applied at 50 kg/ha actual N. Phosphorus and potassium levels were adequate. Harvesting was done on October 28, 1999 by hand harvesting a sub-section of each plot. Tops and roots were harvested separately. After soil was removed, each portion was weighed then dried. From the dry weights, dry matter yields were calculated.

Table 1. Varieties of turnips under evaluation.

Variety	Source	Description
Laurentian	public variety: from Labonte Seed, New Liskeard, ON	Yellow fleshed rutabaga, sweet, intended for human food
Purple Top	public variety: from Ontario Seed Co. Waterloo, ON	White fleshed summer turnip, for human food or animal feed
Barkant	Barenbrug Seed Co. variety: from Emerald Seeds, Dobbinton, ON	High yielding turnip bred for increased leaf growth, for pasture use
Dynamo	Advanta Seeds Pacific, Albany, OR, USA	Stubble turnip with rapid early growth and globe-shaped roots, for pasture use
Samson	Advanta Seeds Pacific, Albany, OR, USA	Stubble turnip with large tankard shaped roots, high palatability, for pasture use

Results:

Tops: The tops (leaves) of the turnips ranged in dry matter content from only 14.5% up to 25.5% (Table 2). The higher dry matter levels in Laurentian and Purple Top leaves suggests that they were beginning to die and dry up more than the other varieties. Top yields were highest in Barkant, intermediate in Samson, Laurentian, and Dynamo, and lowest in Purple Top (Table 2). Top yields would likely have been somewhat higher if harvesting had been done 2 to 3 weeks earlier since frost had caused some leaf senescence (death) to occur.

Roots: Root dry matter content was much lower than in the tops, although the variability was high and therefore significant differences could not be detected between varieties (Table 2). Root yields were highest for Samson and Laurentian, and intermediate for the other three

varieties.

Total Yield: Total yield (top plus root) was numerically greatest for Barkant and lowest for Purple Top, although statistically, Barkant, Samson, and Laurentian were not different from each other (Table 2).

Top: Root Ratio: A top:root ratio greater than 1 indicates that the tops yielded more than the roots, while a ratio less than 1 indicates a greater yield from the roots as compared to the tops. Barkant had a high ratio, indicating a high yield of tops relative to roots, while Dynamo also had a ratio above 1. The other three lines all had ratios around 0.7 to 0.8, indicating a greater root yield than top yield. As mentioned above, earlier harvesting would likely have resulted in a higher top yield, which would have resulted in higher top:root ratios than we measured.

Table 2. Dry matter content (%) and dry matter yield (kg/ha) of tops and roots.

Variety	%DM Top	Yield Top	%DM Root	Yield Root	Total Yield	Top:Root
Barkant	14.5 d ²	4,701a	11.6	2,603 bc	7,304a	1.85:1
Samson	17.7 c	3,026 b	8.3	3,736a	6,762ab	0.82:1
Laurentian	25.5a	2,537 bc	13.4	3,552ab	6,088abc	0.72:1
Dynamo	18.7 c	2,882 b	12.7	2,320 c	5,203 bc	1.3:1
Purple Top	20.8 b	1,912 c	11.3	2,599 bc	4,511 c	0.74:1
Average	19.4	3,011	11.5	2,962	5,974	1.1:1
Significance ¹	***	***	ns	*	*	***
CV (%)	5.2	19.3	27.5	21.8	19.1	19.3

1. ns=not significant; *, **, *** significant at P<0.05, 0.01, and 0.001, respectively

2. Within a column, means followed by different letters are statistically different

Summary and Interpretation: Stubble turnip top yields ranged from 2 to 4.7 t/ha, with varieties bred specifically for grazing having higher top yields. Root yields ranged from 2.3 to 3.7 t/ha. Two of the five varieties tested had higher top yields than root yields, while the opposite was true for the other 3 varieties. The yields recorded here are similar to or higher than those reported from Atlantic Canada and similar to or below those reported from Michigan. The stands at New Liskeard produced rather small roots (mostly less than 10 cm diameter) and may have had too high a plant population. A field scale seeding on the same farm appeared to have much higher root yields from a lower seeding rate (see animal data on separate report). Overall, it is likely that higher yields than those obtained here could be achieved.

Top yields were likely lower than maximum due to the late harvest date. In field use, it is desirable to graze the tops first (using portable fencing to strip graze the field) prior to repeated

heavy frosts, then graze the field in the reverse direction to allow the sheep to consume the roots in late fall or winter. The roots do not degrade in yield or quality as much as the tops due in late fall (see separate research update from NLARS).

Given the results above, a strategy could be developed to drill two types of stubble turnips, one with a high top:root ratio and one with a low top:root ratio. The former (perhaps Barkant or Dynamo) could be grazed in early fall to take advantage of the high top yields while the latter (perhaps Samson) could be utilized later in the fall to utilize the higher root mass. Further testing will be done to see how consistent the performance of these lines are over two or more years.