Managing Crop Duration Helps to Manipulate Root Sizing in QF Cut and Peel Carrots

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Introduction

Cut and peel carrot production for Quick Freeze (QF) processing is a recent addition to the carrot processing industry in Nova Scotia. Oxford Frozen Foods Ltd, Canada's largest processor of freeze processed carrots, began processing cut and peel or baby carrots in 2002. Root sizing directly effects yield, quality and profitability of QF carrots. Roots which are too large in diameter (>1") are not suitable for baby carrot production. Root sizing can be manipulated by adjusting the seeding and harvesting (crop duration) in a particular genotype. A study was conducted to identify the optimum seeding and harvest date combinations for obtaining optimal yield and quality in the cut and peel variety, Sugarsnax.

Materials and Methods

- Three separate fields were selected in King's County, Nova Scotia and sown on May 8th (Early), May 16th (Mid) and May 22nd (Late), 2003. Field was used as a blocking factor.
- Early (July 30th), mid (August 14th) and late (August 25th) harvests were done in each field with the exception of a late harvest in the mid season seeded field.
- A total of eight combinations of seeding and harvest dates were evaluated.
- Five, one meter samples were randomly harvested from each field on each harvest date.
- Measurements were made on gross yield, recovery, root girth and length, leaf fresh weight, dry weight and number of leaves.
- Data was analyzed using the MIXED procedure (SAS Institute Inc.). The interaction between seeding and harvest date was significant, therefore means were separated using LS Means (p=0.05).

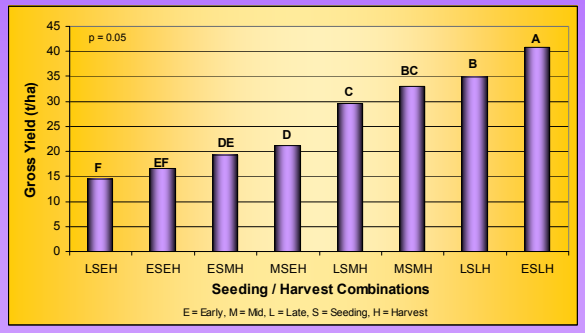

Figure 1. Gross yield as influenced by various seeding/harvest combinations

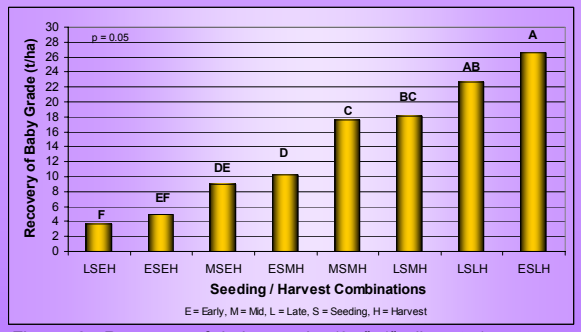

Figure 2. Recovery of baby grade (0.5"–1" diameter) roots as influenced by various seeding/harvest combinations

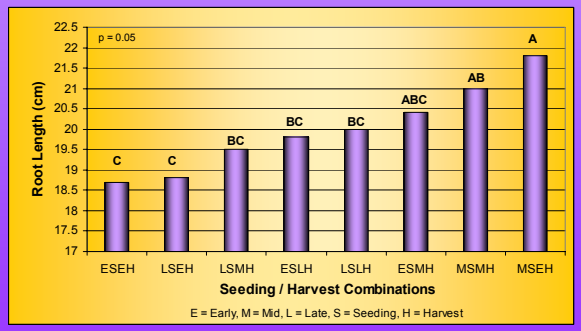

Figure 3. Root length as influenced by various seeding/harvest combinations

Results

- The interaction between seeding and harvest date was significant.
- The highest gross yield (40.8 t/ha) was recorded in the field which was seeded early and harvested late - ESLH (109 days), which was statistically significant over all other seeding/harvest combinations (fig 1).
- This combination also produced the greatest amount of baby grade roots (fig 2).
- The second highest gross yield (35 t/ha) was recorded by late seeding/late harvest combination - LSLH (95 days).
- Root length was significantly higher in the mid seeding early harvest - MSEH (75 days) (fig 3). Differences in root length were not seen between harvest dates in each field, rather differences were observed between the three different fields, suggesting field location had more influence on root length.

Conclusion

- Root sizing, yield and grades can be manipulated by managing crop duration.
- The greatest yield and recovery of baby grade carrots was achieved with early seeding and a late harvest (ESLH), which had a crop duration of 109 days.
- All seeding timings combined with early harvest dates had poor yields and recovery of baby grades.