Linking Organic Knowledge
OACC
Organic Agriculture Centre of Canada
oacc.info
Le réseau du savoir biologique
CABC
Centre d'agriculture biologique du Canada
agbio.ca

OILSEED PUMPKIN PRODUCTION: FERTILITY AND PEST CONTROL

Interim Research Report E2008-38

BACKGROUND

Styrian oilseed (or naked-seeded) pumpkin is a new crop for North America, although it has been grown in Austria and Slovenia for generations. The hulless seeds of these pumpkins can be pressed for a high-value dark green oil which is high in zinc, vitamin E, and unsaturated fatty acids. The establishment of a new oil press in Nova Scotia is promoting interest in novel oilseed crops. Health-conscious consumers interested in this oil would also look for organic production methods. In 2007, in cooperation with Foxmill Oil Press and Ballymena Farm, the OACC began a two-year trial to test the suitability of this crop under organic production methods.

RESEARCH OBJECTIVES

- Improve understanding of agronomy and production potential for oilseed pumpkin as a novel crop for producers
- Evaluate best organic management practices for fertility, weed and insect control of oilseed pumpkin
- Assess oilseed pumpkin oil yield and quality for comparison to industry standards

WHAT WAS DONE

The oilseed pumpkin trial was conducted at an organic farm in Parrsboro, NS and at the Brookside Organic Research Site in Truro, NS.

The trial was planted at the beginning of June at both sites, using a small plot seeder at 2" depth. The row spacing used was 0.91 m, and one seed was dropped every 30 cm, resulting in an expected seed rate of approximately 3 seeds m^{-2}. The seed used (cv. *Gleisdorfer olkurbis*, a variety specifically grown for oil) had a low germination rate of 65%, which corresponds to a planting density of 2 seeds m^{-2}.

Experiment 1 tested the effect of increased fertility on pumpkin seed yield and oil yield. We tested four treatments: three levels of fertility (40, 80, and 120 kg ha^{-1} of available N applied) plus an unfertilized control. The amendment used was a pelletized poultry manure that was acceptable for organic production.

In Experiment 2, we tested two different pest control treatments for striped cucumber beetle. Striped cucumber beetle can cause significant damage to the developing seedlings. The first product, Surround™, is a kaolin clay spray. It forms a white film on leaves that is unattractive to the beetles. At the first sign of beetle damage, this product was applied to the young plants with a backpack sprayer at 50 g/L, then half-strength twice after for a total of three treatments. The second product was an organic canola oil sprayed at full strength believed to make the leaves unattractive to the beetles. Weekly beetle counts and pumpkin and seed yield were assessed.

At harvest, pumpkins were weighed and chopped in half, and the seeds were scooped out by hand. Seed from a representative subsample of ten pumpkins per plot was collected. The seed was washed and air-dried at 50°C for three days. Oil content was determined for a composite sample from each fertility treatment.

Mature oilseed pumpkin (J. MacKenzie)

Table 1. Yield and yield components of pumpkin seed from fertility trial, Parrsboro and Brookside 2007

Fertility Level (kg N ha^{-1})	Plant Density (plants m^{-2})	Pumpkin Density (fruit m^{-2})	Weight per Pumpkin (kg)	Seed per Pumpkin (g)	Seed Weight (g 1000 $seeds^{-1}$)	Mature Seed Yield (g seed m^{-2})
0	0.66a	0.65a	5.25	76.8	231	41.0
40	0.64a	0.55b	5.60	84.9	246	36.6
80	0.57ab	0.55b	5.61	82.9	241	37.2
120	0.52b	0.54b	5.65	85.3	248	37.7
P > F	***0.061***	***0.066***	*0.405*	*0.152*	*0.229*	*0.768*
SE	0.1093	0.13	0.43	3.06	7	6.10

a-b Means followed by the same letter are not significantly different (P<0.10)

PRELIMINARY RESULTS

Fertility Trial

Crop density was lower than anticipated: approximately 0.5 plants m^{-2} at Brookside and 0.7 plants m^{-2} at Parrsboro. The pumpkin plant density declined slightly with increased fertility (Table 1), which may be due to excess salts from high levels of the dried manure. Similarly, the number of pumpkins m^{-2} was higher in the control than the three fertilized treatments. Although not significant, oil content and mature seed yield was higher in the control but the seed yield per pumpkin and seed size was smaller. There was no significant difference in seed yield in the analysis of both sites together; however, at Parrsboro there was a non-significant increase in seed yield with fertility treatments.

Oil content of the seed is presented for composite samples for both sites in Figure 1. On average, oil content was higher at Brookside (50.7%) than Parrsboro (48.8%). Oil yield (Table 1) is estimated from average yields and oil content for each treatment.

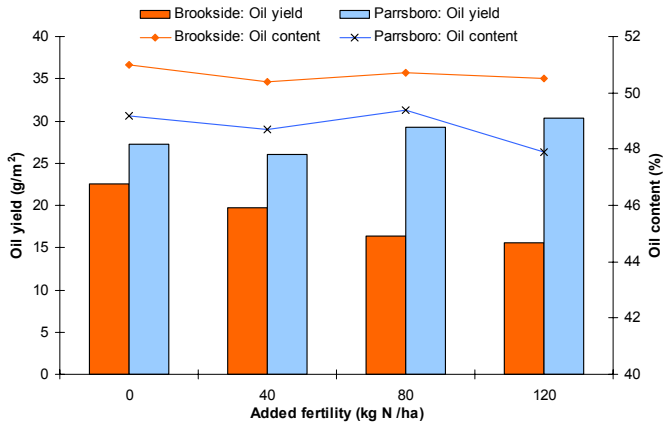

Figure 1. Oil content for pumpkin seeds from fertility trial at two sites, 2007

CREDITS

Roxanne Beavers, Joanna MacKenzie and Andy Hammermeister (OACC)

Pest Control Trial

At 5 weeks after planting, the number of beetles observed on the Surround™-treated plants was fewer than the control at both sites. The canola oil treatment was less effective; the application rate of oil may have been too high as there were fewer plants and pumpkins in the oil-treated plots. By 7 weeks, there were no differences observed between any treatments. The use of Surround™ increased seed yield, but this was not significantly higher than the untreated plots.

THE BOTTOM LINE...

Oilseed pumpkin is an interesting new crop for Maritime organic farmers, but more work must be done to identify best management practices for seed and oil yield.

ACKNOWLEDGEMENTS

Andrew Kernohan (Ballymena Farm, Parrsboro NS)
Peter Fuchs (Foxmill Ltd, Indian Harbour NS)
Drew Jeffrey (PEI)
Engage Agro (Guelph, ON)
OACC technicians, including Lloyd Rector, Paula Schofield and Serge Larochelle

FUNDING

Nova Scotia Department of Agriculture Technology Development Program and Ballymena Farm

Production of this bulletin was supported by:

Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada

For more information:
Visit **oacc.info** or contact us at
P.O. Box 550 Truro, NS B2N 5E3
Tel: (902) 893-7256
Fax: (902) 896-7095
Email: oacc@nsac.ca

NSAC. Embrace Your World.