



## SUSTAINABLE PRODUCTION OF ORGANIC HIGH VALUE VEGETABLE CROPS ON THE PRAIRIES

*Interim Research Report W2008-48*

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### BACKGROUND

Increasing demand for organic food has led to the rapid expansion in the organic industry in Canada and around the world. The vegetable and fruit sector is believed to be the most rapidly expanding sector within organics. Saskatchewan is well placed to compete effectively in the organic vegetable market. Some of the advantages include low land cost, extensive water resources, less insect pressure due to relative isolation and harsh winters, lower disease incidence due to low relative humidity, a knowledgeable and strong organic industry and accessibility to North American urban markets.

Organic vegetable production is a high-value cropping option for irrigated agriculture. However, there are significant challenges in production, post-harvest handling, and marketing.

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### OBJECTIVE

This study is designed to develop cost-effective and environmentally sustainable production practices and post-harvest handling for irrigated vegetables under organic management.



**Vegetable trial with conventional inputs (on L) and organic inputs (R)**

To achieve this goal, we will:

- Identify vegetable crops suited for organic production under Saskatchewan growing conditions,
- Develop cost-effective and sustainable agronomic practices for production of organic vegetables under irrigation, and
- Develop crop rotations to improve physical, chemical, and biological properties of soil.

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### WHAT WAS DONE

Field trials were conducted at the Canada-Saskatchewan Irrigation Diversification Centre (CSIDC) during the summer of 2007. This initial study examined the performance of a wide range of vegetable crops under organic and conventional management.

Vegetable crops were established in non replicated plots to compare organic and conventional management. Sweet corn, tomato, pepper, beans, peas, melons, and herbs were planted on plastic mulch. Potato, carrot, onion, cole crops and celery were planted on bare land. Swine compost, 5 cm deep, was applied to the organic plot and tilled under. The conventional plot received standard fertilizer at 100 kg N, 50 kg P, and 60 kg K ha<sup>-1</sup>. All crops were grown using drip irrigation, and soil moisture was maintained above 50% field capacity. Weed control in both organic and conventional plots were achieved through mechanical means. In the organic plot, insects were controlled using Entrust, Rotenone, Trounce, and Neem oil, while in the conventional plot insect control was achieved using registered synthetic insecticides.

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### PRELIMINARY RESULTS

These are initial observations comparing vegetable crops grown under organic and conventional inputs. Three hail storms that occurred on July 31, August 17, and August 18 caused considerable damage to the crops resulting in yield reduction or complete crop loss.

Results are preliminary, and more work is needed before recommendations can be provided.

**Peas and Beans:** Homesteader peas and Tender Green Improved beans grown with organic inputs produced more vigorous plants and higher pod yield than when they were grown with conventional inputs.

**Celery:** The celery crop did not suffer from hail damage as severely as some other crops. Conventional celery outyielded the organic.

**Onion:** Hail damage severely depressed onion yields. Conventionally grown Yellow Dutch onion and Spanish onion produced higher yields than onions grown with organic inputs.

**Peppers:** Several varieties of sweet bell, banana, and hot peppers were evaluated. Hail affected crop growth and yield of different cultivars to varying degrees. Crop yield was increased with organic inputs for some cultivars and reduced for other cultivars.

**Sweet Corn:** The sweet corn crop yield was considerably reduced due to hail damage. However, sweet corn plants grown with organic inputs were more vigorous and produced more cobs than the conventional sweet corn.

**Potato:** For all four varieties tested, potatoes grown with organic inputs produced higher marketable tuber yields than the crop grown under conventional production.

**Cole Crops:** Cabbage, cauliflower, broccoli, and Brussels sprouts were evaluated with organic and conventional inputs. Flea beetles and root maggots were the major pests. The use of recommended insecticides controlled these insects effectively in the conventional system. Under organic management, Neem oil effectively controlled flea beetles. However, Entrust, Rotenone, Trounce or Neem had no effect on root maggot. Under organic management, the Brussels sprout crop was more severely damaged than the other cole crops in this test.

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## THE BOTTOM LINE...

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This observational study was established to compare vegetable crops grown with organic and conventional inputs.

Preliminary results from 2007 indicate the following:

- Pea, bean, sweet corn and potato grown under organic management produced higher yields than those grown under conventional management.
- Celery, cole crops and onions grown under conventional management outyielded the organic crops.
- In 2007, root maggot control was extremely important for successful production of cole crops and organic control measures tested in this project were ineffective.
- Hail caused considerable crop damage.

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## CREDITS

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