

The logo features the word "McCain" in a white, cursive font on a black rectangular background with a yellow border. This is placed on a red maple leaf graphic, which is set against a larger red background that has a white, torn-paper-like edge on the right side.

Potato Varieties Suitable For Organic Production

**Yves Leclerc,
McCain Foods
(Canada)**

Organic potato production

- **Organic potato production currently occupies less than 1% of the Canadian potato market**
- **Majority of production is destined to the table market**
- **Some processors have expressed interest in organic potato production (Maple Leaf Foods- Alberta, 2002)**

Denmark

- In 2002, Denmark produced 17,601 tonnes (on 747 hectares) of organic potatoes out of a total national potato production of 1.5 million tonnes.
- The yield of organic potatoes was 23.6 tonnes/hectare compared with average of 35.8 t/ha for ware potatoes.
- On average yield of organic potatoes was 34% lower than conventionally grown

Source: Danmarks Statistik, World Organic News 2003

Netherlands

- In 2002, the Netherlands produced 24,000 tonnes of organic potatoes out of a total national potato production of 7.4 million tonnes
- The yield of organic potatoes was 22.5 tonnes/hectare compared with average of 44.8 t/ha for ware potatoes. They had a late blight problem
- The yield of organic potatoes was 1/2 of the yield of the conventionally produced potatoes

Major limitations

- **Disease resistance (Late Blight)**
- **Fertility requirements (Nitrogen)**
 - **Potato has high N requirements**
 - **Nitrogen efficiency of potato is generally high and increases with long season varieties**
 - **Total yield and tuber size**
- **Acceptable genotypes?**

Variety Selection

- In “conventional” potato production systems, varieties grown are generally dictated by market requirements
- Organic production is probably less subject to market requirements at this point in time, may be benefit for organic growers to capture high end markets with specialty and gourmet varieties (fingerling and exotic skin/flesh combinations)

Variety Selection

- **The specialty and gourmet variety market is limited and will likely saturate rapidly unless efforts are made in promotion (Joyce Coffin, Fruits and Vegetable Magazine Jan 2004)**
- **If organic production is to become “mainstream” the industry will have to increase it’s productivity and grow varieties with greater yield potential, i.e. mid-long season varieties and overcome limitations**

McCain Foods Ltd. Organic Trials



**Maine 2000-2002
Using Maine Organic
Farmer and Gardeners
Association production
guidelines**

McCain Organic Trials

- Aimed at evaluating a number of commercial varieties and breeding lines under organic management:

Agria

A90586-11

Exp. cv. 1

Exp. cv. 2

Kennebec

Santana

Sante

Shepody

Solide

Russet Burbank

Umatilla Russet

Methodology

- Potatoes grown following green manure clover crop (50 lbs/acre N)
- 25 t/ac of manure was applied in Spring 62, 187 and 92 lbs/acre of N, P_2O_5 and K_2O + 2500 lbs/ac of alfalfa meal (2.6- 0- 2.3) + 630 lbs/ac blood meal (12- 0- 0)
- Total nutrients supplied (lbs/acre):
N= 252 P_2O_5 =187 K_2O =149

Methodology

- **Insect Pests (CPB) were controlled with BT and Beauvaria**
- **Fungal diseases were control using CuSO_4**
- **Weeds were controlled using Lely spring-tine harrow for weeds**

Total Yields

Total Yield (cwt/acre)

	2000	2001	2002	AVG
Agria	178	154	225	186
A90586-11	210	184	197	197
Exp. cv. 1	172	158	190	173
Exp. cv. 2	219	197	194	203
Kennebec	202	186	216	201
Santana	185	138	179	167
Sante	202	179	213	198
Shepody	187	162	182	177
Solide	163	209	226	199
Russet Burbank	184	172	212	189
Umatilla Russet	---	152	199	175
Mean Organic	189	172	204	188

Marketable Yields

Marketable Yield (cwt/acre)

	2000	2001	2002	AVG
Agria	136	119	194	150
A90586-11	113	131	109	118
Exp. cv. 1	132	121	149	134
Exp. cv. 2	100	114	113	109
Kennebec	164	159	170	164
Santana	67	95	86	83
Sante	166	131	174	157
Shepody	126	114	135	125
Solide	120	156	139	138
Russet Burbank	116	110	147	124
Umatilla Russet	---	77	131	104
Mean Organic	124	121	144	130

Tuber size

Smalls (% < 2 “)

	2000	2001	2002	AVG
Agria	12	6	11	10
A90586-11	39	22	33	31
Exp. cv. 1	20	23	21	21
Exp. cv. 2	55	42	42	46
Kennebec	6	12	12	10
Santana	59	26	50	45
Sante	19	26	19	21
Shepody	19	22	18	20
Solide	35	27	40	34
Russet Burbank	37	38	32	36
Umatilla Russet	---	52	36	44
Mean Organic	28	26	28	27

Yields and Crop Values

Average of 3 years

Yield

	Total (cwt/ac)	Mkt (cwt/ac)	Value (\$/ac)
Organic	188	130	968
Conventional	248	191	1350
Difference	- 24 %	- 32 %	- 28 %

Supplying Demand

- Based on yield obtained and assuming that the demand for potatoes from eastern Canada remained the same, PEI and NB would require at least 32% more acreage to supply current demand for potatoes if they were grown organically:
- **PEI: 110,000 >>>> 162,000 acres**
- **NB: 58,000 >>>> 85,000 acres**

McCain Foods (Canada) Fertility Trials



Potential Solution

- **For organic production to have the potential to become “mainstream”, several hurdles need to be addressed, chief among them is to meet the potato fertility requirement (especially N)**
- **Alternative sources nutrients: Pelletized composted manure, such as the one produced by Agrior (Quebec) could potentially solve this problem**

Fertility Trial

- **In order to investigate the potential efficiency of organic fertilizers (Agrior), trials were conducted in 2002 and 2003 with cv. A90586-11**
- **Agrior Organic fertilizer was compared to several rates of mineral fertilizers**

Yields and Crop Values

Average of 2 years

Yield

	Total (cwt/ac)	Mkt (cwt/ac)	Value (\$/ac)	% Smalls
Organic	356	272	2253	15
Mineral	342	257	2137	15

Conclusions

- **Constraints in the organic production system currently do not allow varieties to reach their full yield potential (nitrogen)**
- **Many varieties that had high total yield did not necessarily have high marketable yields due to high proportion of small tubers**
- **Kennebec, Sante and Agria highest marketable yield & lowest % smalls**

Conclusions

- **Novel sources of readily available nutrients will be required to increase the productivity of organic production system**
- **Growers should be encouraged to utilize Late Blight resistant varieties**

Coexistence of organic and conventional potato production in Atlantic Canada

- If organic potato production is to grow in Atlantic Canada, mechanisms must be put in place to deal with community disease such as Late Blight.**
- Failure to do so could lead to increased use of pesticide in conventional potato production system**

Coexistence of organic and conventional potato production in Atlantic Canada

- **The “Dutch” model: In the Netherlands, organic producers are required by law to top-kill their crop when late Blight is present in the area.**
- **Similar model should be investigated in Atlantic Canada**



Thank You