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**TECHNICAL REPORT**

# **ONTARIO FRUIT CROPS**

**Adaptation and Impacts Research Division (AIRD)  
Allan Truong, 2005**

**Prepared for the Government of Canada's  
Climate Change Impact and Adaptation Program  
Project A932**

ONTARIO FRUIT CROPS

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## Executive Summary

The Technical Report for Ontario Fruit Crops consists of annual fruit yield data at the Census Division (county level) for apples, grapes, peaches and strawberries. Other Census Division level data are included in the Ontario Horticultural Crops technical report. In this report, the crops documented include: apples, sour cherries, sweet cherries, grapes, peaches, pears, plums and prunes, raspberries, strawberries, other fruits and total fruits. "Other Fruits" are defined by OMAFRA to include a few or all of the following but may not be consistently included every year: apricots, blueberries, cantaloupe, melons and nectarines. This report also uses other indices including percentage yield change from previous year, percentage of the long-term average, yield rankings based on percentage of long-term average and linear trend line analysis to help identify variations in crop yields during the 2001 and 2002 droughts.

### Ontario Fruit Yields 1979-2003

Crops highlighted below either showed yields that were below the trend line, had a difference of 15% or more from the long-term average, had a change of 15% or more from the previous year or a rank in the first or last five based on the percentage of the long-term average.

2001: - The yield of sour cherries, peaches, pears and raspberries were below the 1979-2003 trend line.

- Yields of sour cherries, pears, raspberries and strawberries were below the long-term average at 67.7%, 78.1%, 82.1% and 81.5% respectively.
- Yields of apples, sweet cherries, other fruits and the total fruit crops were above the long-term average at 152.5%, 128%, 125.7% and 128.8% respectively.
- Sour cherries and pear yields had a negative change of -34.8% and -30.1% respectively, while plums and prunes had a positive change of 26.1%.
- Sour cherries were ranked third from last and raspberries were ranked fourth from last.
- Apples and total fruits were ranked second, while sweet cherries and peaches were ranked fifth.

2002: - All the different fruit crops and the total fruit crop yields were below the trend line except for grapes and other fruits.

- Yields of sour cherries, sweet cherries, pears, raspberries and strawberries were below the long-term average at 72.4%, 59.5%, 79.7%, 85.9% and 76.2% respectively.
- Other fruits were above the long-term average at 164.8%.
- Apples, sweet cherries, plums and prunes, and total fruit yields had a negative change of -33.8%, -53.5%, -18.5% and -25.3% respectively.
- Yields of other fruits had a positive change of 31.1%.
- Sour cherries were ranked fourth from last, sweet cherries were ranked second last, and strawberries were ranked last.

- Grapes were ranked fifth and other fruits were ranked second.

In 2001 and 2002, sour cherries, peaches, pears and raspberries were the only crops with yields below the long-term trend line in both years. Meanwhile, grapes and other fruits had above-average yields (i.e., above the trend line) in both 2001 and 2002. Sour cherries, pears, raspberries and strawberries had a difference of 15% or more below the long-term average in 2001 and 2002, while other fruits had a difference of 15% or more above the long-term average in the same period. Plums and prunes were the only crop that had a change in yield of 15% or more in both year, with one year increasing and the other decreasing. Finally, sour cherries were the only crop that consistently had yields that ranked in the bottom five of the yield rankings, while sweet cherries had a huge change from being ranked fifth in 2001 and then second last in 2002.

### **References**

Mailvaganam, S. 2005. Statistical Services for Ontario Ministry of Agriculture Food and Rural Affairs (OMAFRA). *Email Communication*. August, 2006.

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## Overview

County level data were only available for the following products: apples, grapes, peaches and strawberries and are not included in this report. Instead, the data are included in the *Ontario Horticultural Crops* technical report. This report consists of annual fruit yield for *apples, sour cherries, sweet cherries, grapes, peaches, pears, plums and prunes, raspberries, strawberries, other fruits and total fruits*. To clarify the definition of *Other Fruits*, Siva Mailvaganam of the Statistical Services for Ontario Ministry of Agriculture Food and Rural Affairs (OMAFRA) was contacted. The reply email said “*Other Fruits* include a few or all of the following and not consistent every year: apricots, blueberries, cantaloupe and melons, nectarines”. All original data were acquired from OMAFRA. Annual fruit yields are calculated by the following formula for the time period of 1979-2003:

Marketed Production of fruit ('000 lbs) / Harvested Area of fruit (acre)

Marketed production data acquired from OMAFRA web site

[http://www.omafra.gov.on.ca/english/stats/hort/prod\\_fruit.html](http://www.omafra.gov.on.ca/english/stats/hort/prod_fruit.html)

Area harvested data acquired from OMAFRA web site

[http://www.omafra.gov.on.ca/english/stats/hort/harv\\_fruit.html](http://www.omafra.gov.on.ca/english/stats/hort/harv_fruit.html)

Fruit yield therefore is reported in units of '000lbs/acre

The annual fruit yields are then averaged to get the provincial yield average for each crop for the time period of 1979-2003. The column directly beside yield displays the *percentage of change from previous year*. It is calculated by first dividing the present year by the previous year. If the resultant number is equal to 1, then there is no change from the previous year. If it is below 1, then it is subtracted by 1, or if the number is above 1, then 1 is subtracted from the number. Finally, the value is converted into a percentage. A negative percentage implies a decrease in production relative to the previous year. A zero value implies no change in yield values from the previous year and a percentage without a sign in front of the value implies an increase in yield. Additionally, this report consists of *percentage of the long-term average*. To calculate *the percentage of long-term average*, the annual yield average of each fruit is divided by the average from 1979-2003 (long term average). There are tables for each crop that summarize annual yield and rankings of the *percentage of average* from largest yield to smallest

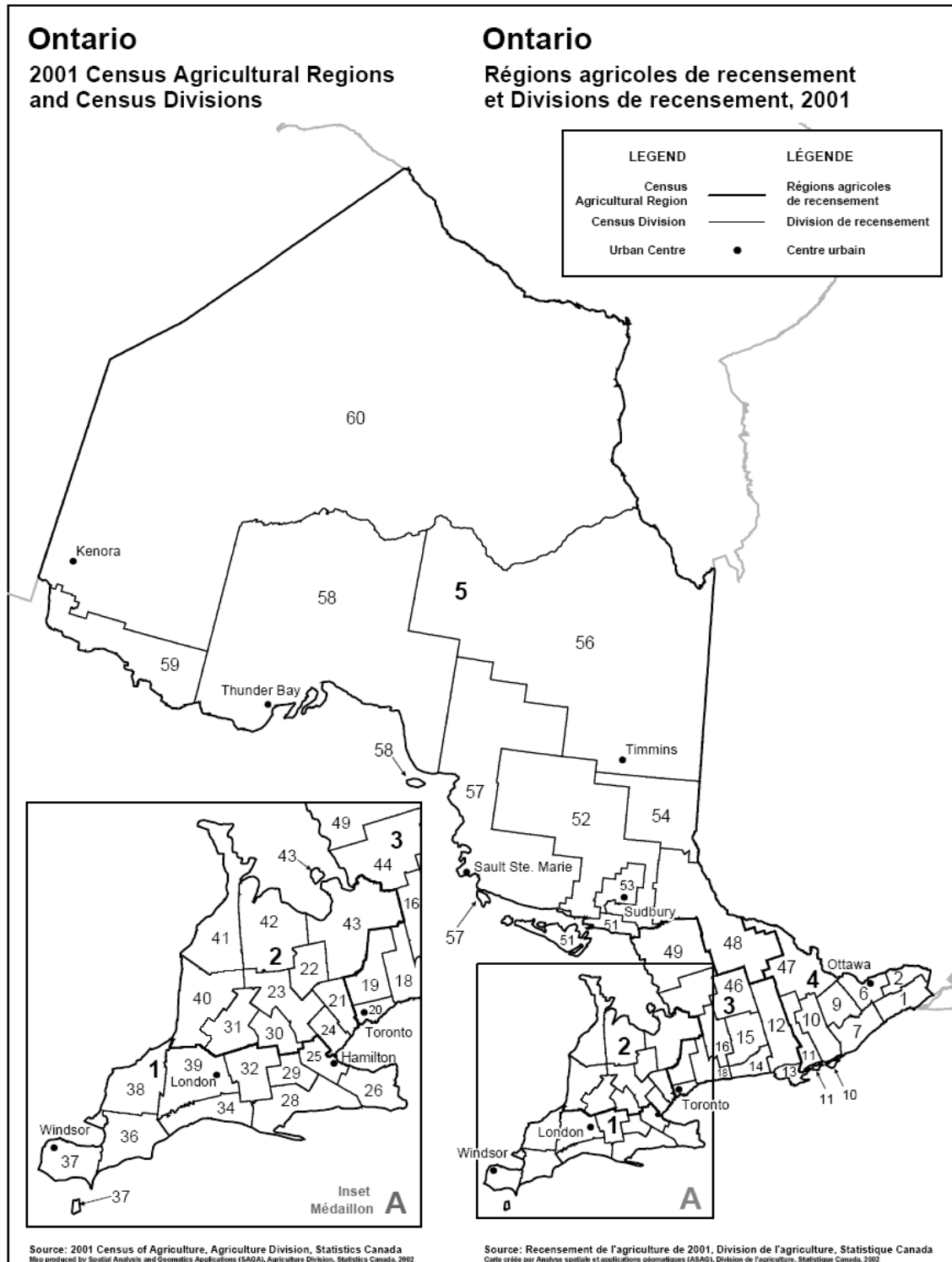
yield. The 2001 and 2002 drought years are highlighted and in bold. The tables are accompanied by a linear regression line graph and each graph includes a trend line and the  $R^2$  value.

The conclusion summarizes the findings of this report and uses 3 indices to detect variations in 2001 and 2002 crop yield data: linear trend line analysis, yield rankings and percentage change from previous year. The linear trend line method observes the slope of the trend line and notes if 2001 and 2002 yield are below or above the linear regression line. Yield rankings are based on percentage of long-term average and yield from 2001 and/or 2002 that are in the bottom 5 are identified. The Percentage change from previous year detects sudden change in the long-term data.

The table following the map summarizes annual yield from 1979-2003 for all the reported fruits. The subsequent pages are detailed analysis of fruit yields from 1979-2003 with the rankings of *percentages of average* and graphs of the yield values.

# Map of Ontario Census Agricultural Regions

From: Statistics Canada. 2005. Accessed: <http://www.statcan.ca/english/freepub/95F0301XIE/maps/ontcar.pdf>



**2001 Census Agricultural Regions and Census Divisions**  
**Régions agricoles de recensement et divisions de recensement, 2001**

- 1 Southern Ontario Region**  
**Région du Sud de l'Ontario**
  - 25 Hamilton Division
  - 26 Niagara Regional Municipality
  - 28 Haldimand-Norfolk Regional Municipality
  - 29 Brant County
  - 32 Oxford County
  - 34 Elgin County
  - 36 Chatham-Kent Division
  - 37 Essex County
  - 38 Lambton County
  - 39 Middlesex County
  
- 2 Western Ontario Region**  
**Région de l'Ouest de l'Ontario**
  - 21 Peel Regional Municipality
  - 22 Dufferin County
  - 23 Wellington County
  - 24 Halton Regional Municipality
  - 30 Waterloo Regional Municipality
  - 31 Perth County
  - 40 Huron County
  - 41 Bruce County
  - 42 Grey County
  - 43 Simcoe County
  
- 3 Central Ontario Region**  
**Région du Centre de l'Ontario**
  - 12 Hastings County
  - 13 Prince Edward Division
  - 14 Northumberland County
  - 15 Peterborough County
  - 16 Kawartha Lakes Division
  - 18 Durham Regional Municipality
  - 19 York Regional Municipality
  - 20 Toronto Division
  - 44 Muskoka District Municipality
  - 46 Haliburton County
  - 49 Parry Sound District
  
- 4 Eastern Ontario Region**  
**Région de l'Est de l'Ontario**
  - 1 Stormont, Dundas and Glengarry United Counties
  - 2 Prescott and Russell United Counties
  - 6 Ottawa Division
  - 7 Leeds and Grenville United Counties
  - 9 Lanark County
  - 10 Frontenac County
  - 11 Lennox and Addington County
  - 47 Renfrew County
  
- 5 Northern Ontario Region**  
**Région du Nord de l'Ontario**
  - 48 Nipissing District
  - 51 Manitoulin District
  - 52 Sudbury District
  - 53 Greater Sudbury Division
  - 54 Timiskaming District
  - 56 Cochrane District
  - 57 Algoma District
  - 58 Thunder Bay District
  - 59 Rainy River District
  - 60 Kenora District

## Ontario Fruit Yields 1979-2003

Year	Apples ( <sup>'000</sup> lbs/ac)	Sour Cherries ( <sup>'000</sup> lbs/ac)	Sweet Cherries ( <sup>'000</sup> lbs/ac)	Grapes ( <sup>'000</sup> lbs/ac)	Peaches ( <sup>'000</sup> lbs/ac)	Pears ( <sup>'000</sup> lbs/ac)	Plums & Prunes ( <sup>'000</sup> lbs/ac)	Raspberries ( <sup>'000</sup> lbs/ac)	Strawberries ( <sup>'000</sup> lbs/ac)	Other fruits ( <sup>'000</sup> lbs/ac)	Total ( <sup>'000</sup> lbs/ac)
1979	12.6	7.6	3.1	5.3	6.7	9.3	5.8	1.5	7.9	<b>14.2</b>	8.3
1980	15.4	8.8	4.3	<b>5.2</b>	8.2	<b>10.8</b>	6.4	1.7	<b>8.1</b>	8.6	9.6
1981	<b>9.8</b>	<b>2.1</b>	<b>1.5</b>	6.0	<b>4.4</b>	8.1	3.0	1.5	7.4	9.5	<b>7.1</b>
1982	13.1	6.5	2.9	5.5	7.5	7.6	5.9	1.8	6.3	10.1	8.8
1983	14.2	5.9	3.9	6.7	8.8	8.6	4.2	1.8	5.4	11.0	9.6
1984	12.4	6.8	4.9	7.7	6.7	8.3	4.7	1.6	6.0	10.3	9.1
1985	15.5	6.3	3.3	5.9	9.4	8.5	3.9	1.6	6.9	8.0	9.9
1986	13.3	4.0	3.0	7.4	7.9	9.8	<b>6.6</b>	1.8	6.0	6.6	9.4
1987	14.2	6.3	2.6	6.8	9.6	8.7	4.2	1.9	5.7	6.7	9.6
1988	12.8	5.6	2.7	7.6	9.3	7.9	3.6	2.0	4.5	7.6	9.4
1989	15.4	6.9	2.7	6.4	8.8	8.8	3.4	<b>2.3</b>	5.7	7.7	10.4
1990	13.9	4.8	3.4	7.9	10.4	7.1	2.8	1.6	5.1	<b>4.2</b>	10.3
1991	15.4	5.7	4.1	<b>9.4</b>	8.4	8.2	4.9	1.4	4.7	5.0	11.2
1992	14.4	<b>9.1</b>	3.6	8.2	9.6	7.6	3.0	1.8	4.7	4.5	10.7
1993	13.0	6.7	3.2	5.6	8.8	6.1	<b>2.7</b>	2.2	5.6	6.4	9.3
1994	15.7	7.2	3.5	7.0	10.5	5.6	3.3	2.1	6.4	6.7	11.1
1995	19.8	7.7	3.0	7.4	11.3	5.2	5.3	1.1	6.6	7.4	13.0
1996	17.4	5.0	3.7	7.7	<b>11.4</b>	7.0	4.3	1.3	4.4	6.8	11.7
1997	19.9	6.4	3.8	7.2	8.1	<b>4.4</b>	4.3	1.8	5.0	7.8	12.3
1998	20.0	5.1	5.1	7.1	9.2	6.3	5.0	1.7	4.9	8.0	12.4
1999	<b>29.2</b>	9.0	5.7	8.9	9.6	8.7	6.0	1.7	5.5	11.4	<b>17.2</b>
2000	25.2	6.4	4.2	7.5	9.9	8.5	4.0	1.5	4.4	10.2	14.5
2001	25.3	4.2	4.6	7.8	10.0	5.9	5.0	1.4	4.6	10.8	14.0
2002	16.8	4.5	2.1	7.9	9.4	6.1	4.1	1.5	<b>4.3</b>	14.2	10.5
2003	21.5	5.5	<b>5.8</b>	5.7	9.9	7.9	5.0	<b>1.1</b>	4.5	11.4	11.8
<b>Average</b>	<b>16.6</b>	<b>6.2</b>	<b>3.6</b>	<b>7.0</b>	<b>8.9</b>	<b>7.6</b>	<b>4.5</b>	<b>1.7</b>	<b>5.6</b>	<b>8.6</b>	<b>10.9</b>
<b>Average minus upper and lower points</b>	<b>16.4</b>	<b>6.2</b>	<b>3.6</b>	<b>7.0</b>	<b>9.0</b>	<b>7.6</b>	<b>4.4</b>	<b>1.7</b>	<b>5.6</b>	<b>8.5</b>	<b>10.7</b>

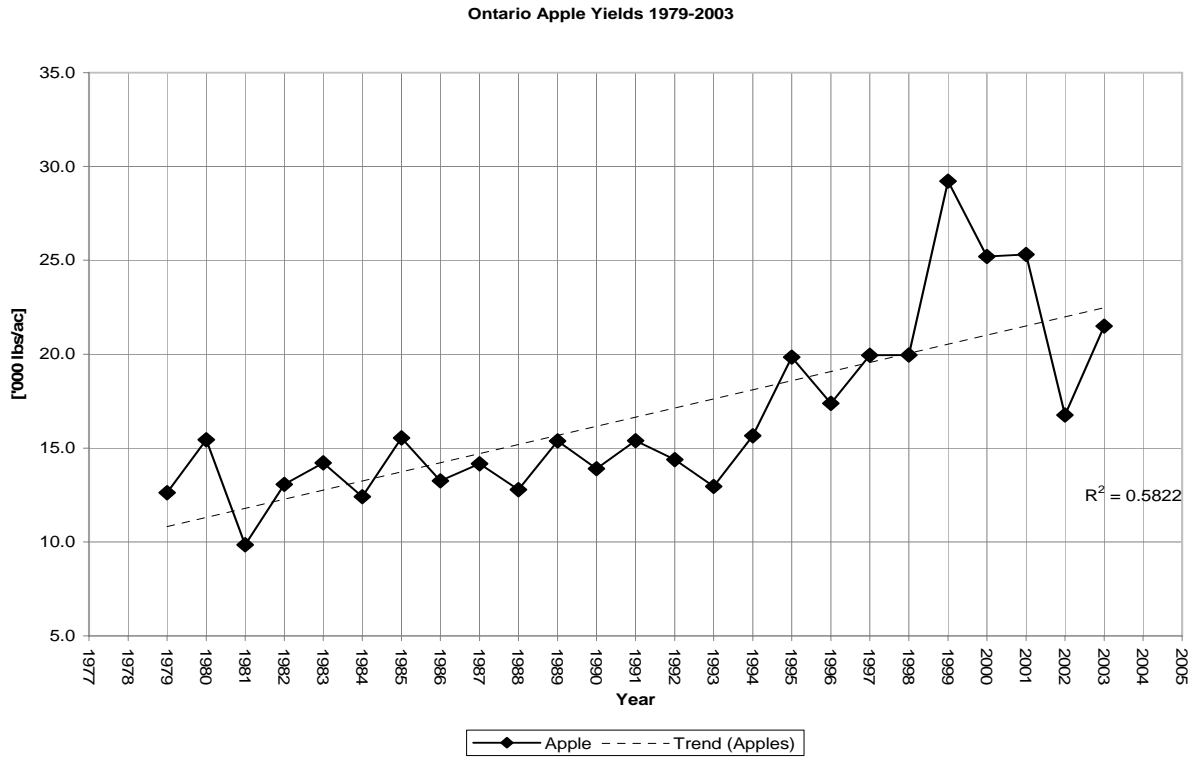
## Ontario Fruit Yields - 1979-2003

### Apples

Year	Apples ('000 lbs/ac)	% Change from previous year	Percentage of long-term average
1979	12.6	N/A	76.1%
1980	15.4	22.3%	93.1%
<b>1981*</b>	<b>9.8</b>	<b>-36.2%</b>	<b>59.3%</b>
1982	13.1	32.7%	78.7%
1983	14.2	8.8%	85.6%
1984	12.4	-12.7%	74.7%
1985	15.5	25.3%	93.7%
1986	13.3	-14.7%	79.9%
1987	14.2	6.8%	85.3%
1988	12.8	-9.7%	77.0%
1989	15.4	20.4%	92.7%
1990	13.9	-9.7%	83.7%
1991	15.4	10.7%	92.7%
1992	14.4	-6.5%	86.7%
1993	13.0	-9.9%	78.1%
1994	15.7	20.8%	94.3%
1995	19.8	26.8%	119.6%
1996	17.4	-12.4%	104.7%
1997	19.9	14.7%	120.1%
1998	20.0	0.1%	120.2%
<b>1999**</b>	<b>29.2</b>	<b>46.5%</b>	<b>176.0%</b>
2000	25.2	-13.8%	151.8%
2001	25.3	0.5%	152.5%
2002	16.8	-33.8%	101.0%
2003	21.5	28.2%	129.5%
<b>Average</b>	<b>16.6</b>		
<b>Average minus upper (**) and lower (*) points</b>	<b>16.4</b>		

Year	Percentage of long-term average	Rank
1999	176.0%	1
<b>2001</b>	<b>152.5%</b>	<b>2</b>
2000	151.8%	3
2003	129.5%	4
1998	120.2%	5
1997	120.1%	6
1995	119.6%	7
1996	104.7%	8
<b>2002</b>	<b>101.0%</b>	<b>9</b>
1994	94.3%	10
1985	93.7%	11
1980	93.1%	12
1991	92.7%	13
1989	92.7%	13
1992	86.7%	15
1983	85.6%	16
1987	85.3%	17
1990	83.7%	18
1986	79.9%	19
1982	78.7%	20
1993	78.1%	21
1988	77.0%	22
1979	76.1%	23
1984	74.7%	24
1981	59.3%	25

Although 2002 is ranked the ninth best year, there was a big drop in yield from 2001. In 2001, *Apple* yield totaled 25,300 [lbs/ac] and in 2002, it was only 16,800 [lbs/ac]. This represents a decline of 34%. Yield for 2002 was slightly above the average of 16,600 [lbs/ac].



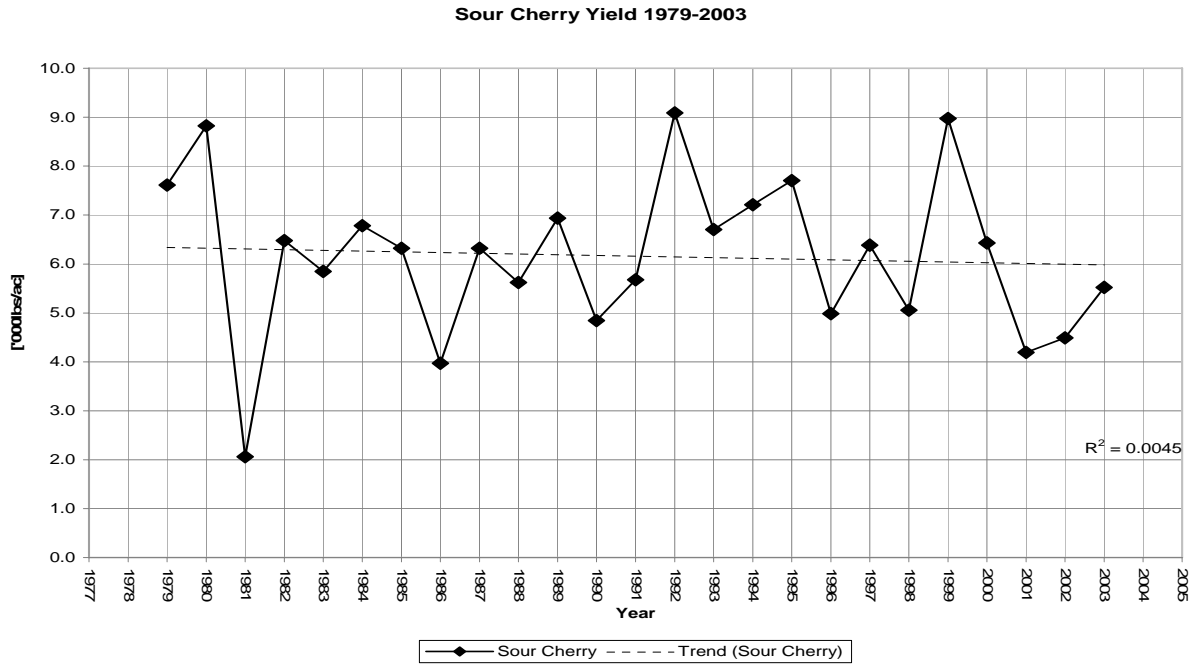
## Ontario Fruit Yield 1979-2003

### Cherries, Sour

Year	Sour Cherries ('000 lbs/ac)	% Change from previous year	Percentage of long-term average
1979	7.6	N/A	122.8%
1980	8.8	15.9%	142.3%
<b>1981*</b>	<b>2.1</b>	<b>-76.6%</b>	<b>33.2%</b>
1982	6.5	214.1%	104.4%
1983	5.9	-9.6%	94.4%
1984	6.8	16.0%	109.4%
1985	6.3	-6.8%	102.0%
1986	4.0	-37.2%	64.1%
1987	6.3	59.1%	101.9%
1988	5.6	-11.0%	90.7%
1989	6.9	23.4%	111.9%
1990	4.8	-30.2%	78.1%
1991	5.7	17.2%	91.6%
<b>1992**</b>	<b>9.1</b>	<b>60.1%</b>	<b>146.5%</b>
1993	6.7	-26.2%	108.1%
1994	7.2	7.5%	116.3%
1995	7.7	6.9%	124.3%
1996	5.0	-35.3%	80.4%
1997	6.4	28.1%	103.0%
1998	5.1	-20.8%	81.6%
1999	9.0	77.4%	144.7%
2000	6.4	-28.3%	103.7%
2001	4.2	-34.8%	67.7%
2002	4.5	7.1%	72.4%
2003	5.5	23.0%	89.1%
<b>Average</b>	<b>6.2</b>		
<b>Average minus upper (**) and lower (*) points</b>	<b>6.2</b>		

Year	Percentage of long-term average	Rank
1992	146.5%	1
1999	144.7%	2
1980	142.3%	3
1995	124.3%	4
1979	122.8%	5
1994	116.3%	6
1989	111.9%	7
1984	109.4%	8
1993	108.1%	9
1982	104.4%	10
2000	103.7%	11
1997	103.0%	12
1985	102.0%	13
1987	101.9%	14
1983	94.4%	15
1991	91.6%	16
1988	90.7%	17
2003	89.1%	18
1998	81.6%	19
1996	80.4%	20
1990	78.1%	21
<b>2002</b>	<b>72.4%</b>	<b>22</b>
<b>2001</b>	<b>67.7%</b>	<b>23</b>
1986	64.1%	24
1981	33.2%	25

Yield for *Sour Cherries* in 2001 was only 67.7% of the calculated average while yield for 2002 was 72.4%. There seemed to be a downward trend that started in 1999 that bottomed out at 2001. It is uncertain whether drought conditions contributed to the decline in yields for 2001 and 2002. The graph on the next page also shows that both 2001 and 2002 yield values are below the trend line.



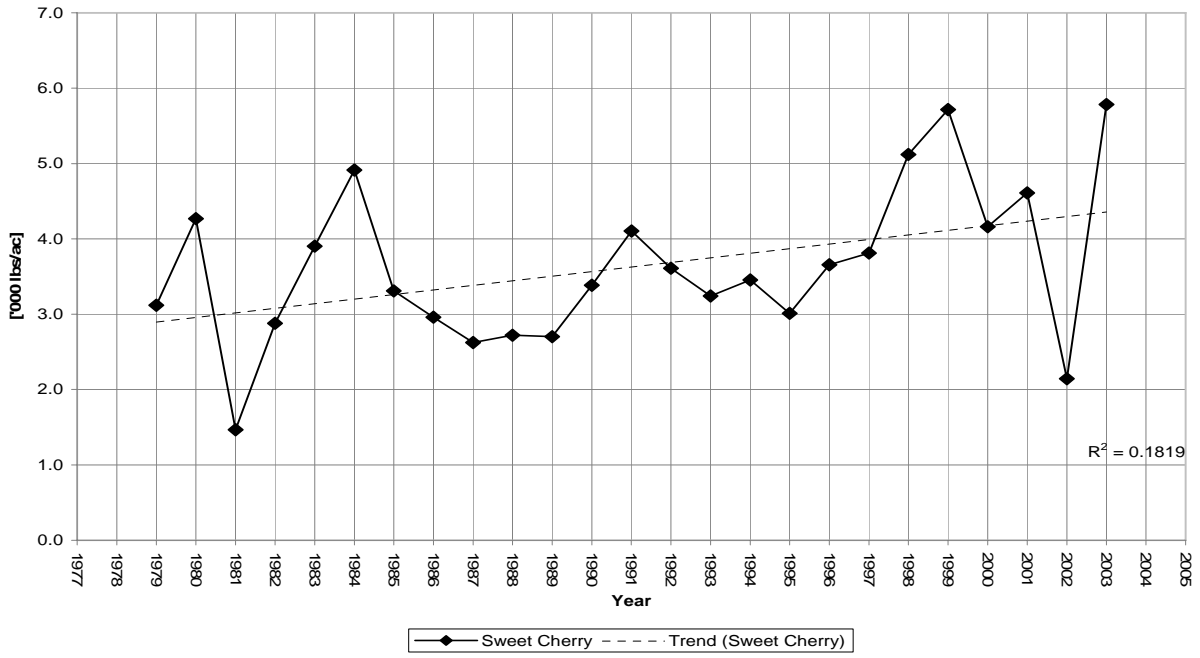
## Ontario Fruit Yields - 1979-2003

### Cherries, Sweet

Year	Sweet Cherries ('000 lbs/ac)	% Change from previous year	Percentage of Average	Year	Percentage of Average	Rank
1979	3.1	N/A	86.6%	2003	160.7%	1
1980	4.3	36.9%	118.6%	1999	158.8%	2
<b>1981*</b>	<b>1.5</b>	<b>-65.6%</b>	<b>40.8%</b>	1998	142.2%	3
1982	2.9	96.3%	80.0%	1984	136.5%	4
1983	3.9	35.5%	108.4%	<b>2001</b>	<b>128.0%</b>	<b>5</b>
1984	4.9	25.9%	136.5%	1980	118.6%	6
1985	3.3	-32.7%	91.9%	2000	115.6%	7
1986	3.0	-10.6%	82.2%	1991	114.0%	8
1987	2.6	-11.3%	72.9%	1983	108.4%	9
1988	2.7	3.6%	75.5%	1997	105.9%	10
1989	2.7	-0.6%	75.1%	1996	101.5%	11
1990	3.4	25.2%	94.0%	1992	100.3%	12
1991	4.1	21.3%	114.0%	1994	96.0%	13
1992	3.6	-12.0%	100.3%	1990	94.0%	14
1993	3.2	-10.3%	90.0%	1985	91.9%	15
1994	3.5	6.6%	96.0%	1993	90.0%	16
1995	3.0	-12.9%	83.6%	1979	86.6%	17
1996	3.7	21.4%	101.5%	1995	83.6%	18
1997	3.8	4.3%	105.9%	1986	82.2%	19
1998	5.1	34.3%	142.2%	1982	80.0%	20
1999	5.7	11.7%	158.8%	1988	75.5%	21
2000	4.2	-27.2%	115.6%	1989	75.1%	22
2001	4.6	10.8%	128.0%	1987	72.9%	23
2002	2.1	-53.5%	59.5%	<b>2002</b>	<b>59.5%</b>	<b>24</b>
<b>2003*</b>	<b>5.8</b>	<b>169.9%</b>	<b>160.7%</b>	1981	40.8%	25
<b>Average</b>	<b>3.6</b>					
<b>Average minus upper (**) and lower (*) points</b>	<b>3.6</b>					

The ranking of *Sweet Cherry* yield for 2001 is deceiving. Although 2001 had yield values 128% of the calculated average, it appears to be a point of a downward trend spanning from 1999-2002. The downward trend bottomed out in 2002 which is ranked the second worst year for sour cherry yield. Again, it is unknown whether drought conditions contributed to the steep decline in 2002 yields. Sweet cherry yield in 2002 was only 59.5% of the calculated average. Yield for 2001 is above the trend line while 2002 is well below.

Ontario Sweet Cherry Yields 1979-2003



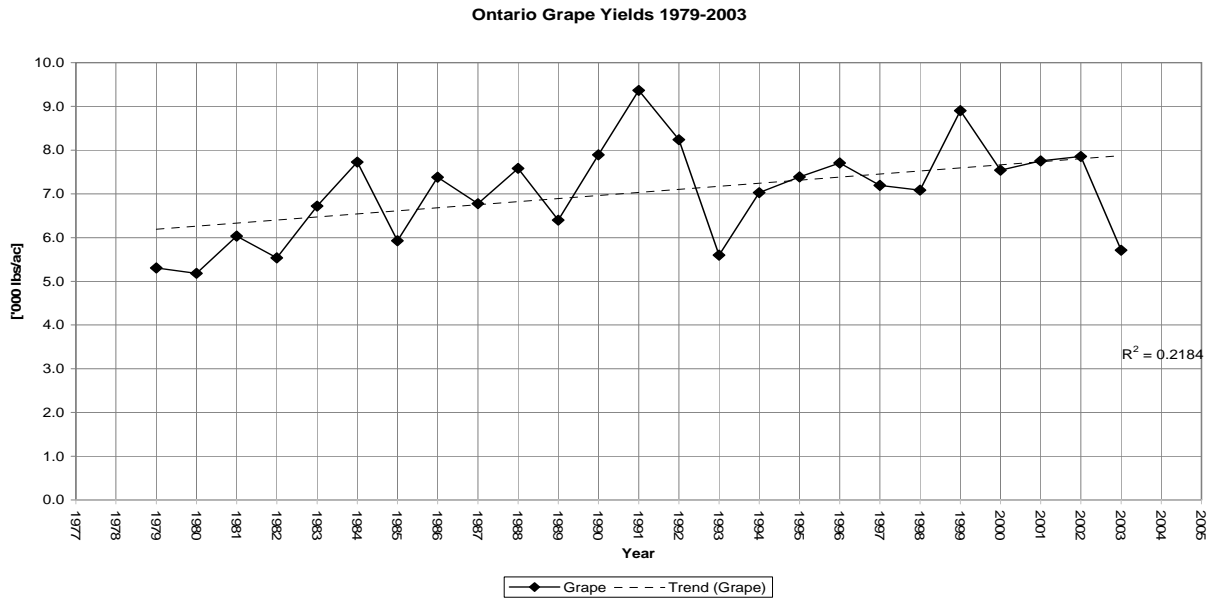
## Ontario Fruit Yield 1979-2003

### Grapes

Year	Grapes ('000 lbs/ac)	% Change from previous year	Percentage of Average
1979	5.3	N/A	75.8%
<b>1980*</b>	<b>5.2</b>	<b>-2.4%</b>	<b>74.0%</b>
1981	6.0	16.4%	86.2%
1982	5.5	-8.2%	79.1%
1983	6.7	21.5%	96.0%
1984	7.7	14.9%	110.4%
1985	5.9	-23.3%	84.7%
1986	7.4	24.6%	105.5%
1987	6.8	-8.2%	96.8%
1988	7.6	11.9%	108.3%
1989	6.4	-15.6%	91.4%
1990	7.9	23.3%	112.8%
<b>1991**</b>	<b>9.4</b>	<b>18.7%</b>	<b>133.8%</b>
1992	8.2	-12.1%	117.7%
1993	5.6	-32.1%	80.0%
1994	7.0	25.6%	100.4%
1995	7.4	5.1%	105.5%
1996	7.7	4.3%	110.1%
1997	7.2	-6.7%	102.8%
1998	7.1	-1.5%	101.2%
1999	8.9	25.6%	127.2%
2000	7.5	-15.3%	107.7%
2001	7.8	2.9%	110.8%
2002	7.9	1.3%	112.2%
2003	5.7	-27.3%	81.6%
<b>Average</b>	<b>7.0</b>		
<b>Average minus upper (**) and lower (*) points</b>	<b>7.0</b>		

Year	Percentage of Average	Rank
1991	133.8%	1
1999	127.2%	2
1992	117.7%	3
1990	112.8%	4
<b>2002</b>	<b>112.2%</b>	<b>5</b>
<b>2001</b>	<b>110.8%</b>	<b>6</b>
1984	110.4%	7
1996	110.1%	8
1988	108.3%	9
2000	107.7%	10
1995	105.5%	11
1986	105.5%	11
1997	102.8%	13
1998	101.2%	14
1994	100.4%	15
1987	96.8%	16
1983	96.0%	17
1989	91.4%	18
1981	86.2%	19
1985	84.7%	20
2003	81.6%	21
1993	80.0%	22
1982	79.1%	23
1979	75.8%	24
1980	74.0%	25

*Grape* yields remained above the long-term average in 2001 and 2002. The year 2001 had yield values that were 110.8% of the calculated average while 2002 had yield values that were 112.2% of the calculated average.



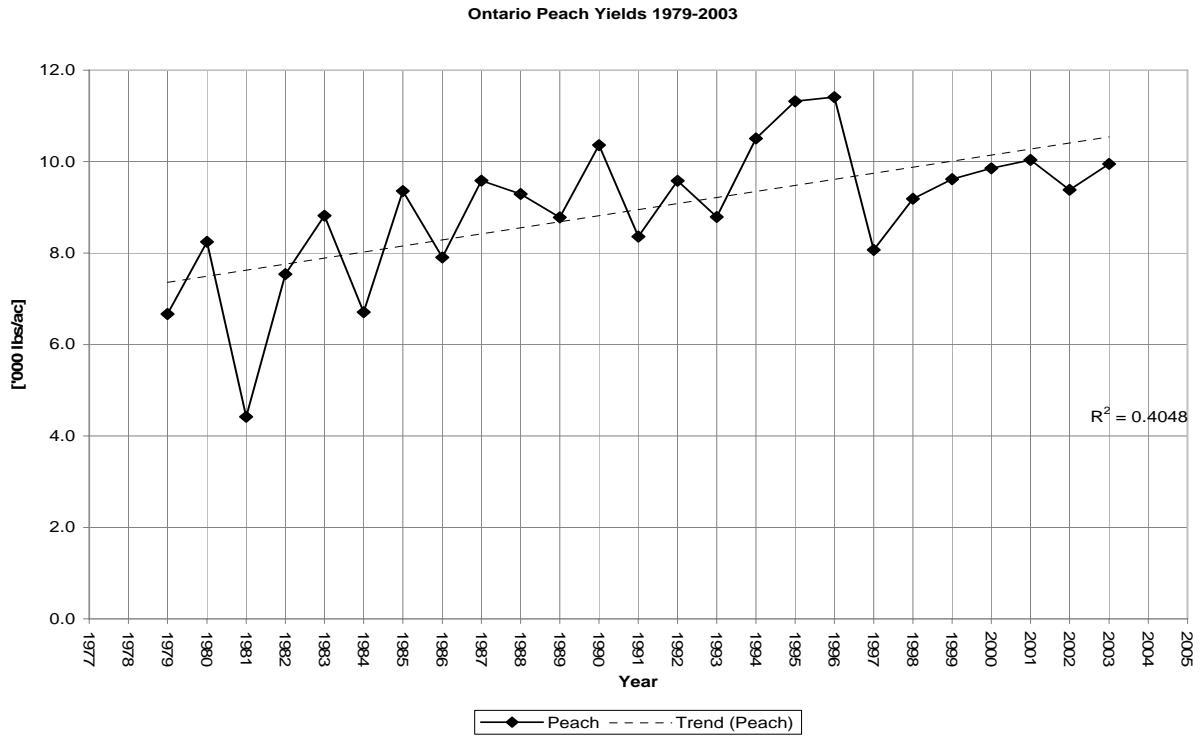
## Ontario Fruit Yields - 1979-2003

### Peaches

Year	Peaches ('000 lbs/ac)	% Change from previous year	Percentage of Average
1979	6.7	N/A	74.9%
1980	8.2	23.8%	92.7%
<b>1981*</b>	<b>4.4</b>	<b>-46.4%</b>	<b>49.7%</b>
1982	7.5	70.6%	84.7%
1983	8.8	16.9%	99.1%
1984	6.7	-23.9%	75.4%
1985	9.4	39.4%	105.1%
1986	7.9	-15.5%	88.8%
1987	9.6	21.3%	107.7%
1988	9.3	-3.0%	104.4%
1989	8.8	-5.5%	98.7%
1990	10.4	18.0%	116.4%
1991	8.4	-19.3%	93.9%
1992	9.6	14.6%	107.6%
1993	8.8	-8.2%	98.8%
1994	10.5	19.5%	118.0%
1995	11.3	7.8%	127.2%
<b>1996**</b>	<b>11.4</b>	<b>0.8%</b>	<b>128.2%</b>
1997	8.1	-29.3%	90.7%
1998	9.2	13.8%	103.2%
1999	9.6	4.7%	108.1%
2000	9.9	2.4%	110.7%
2001	10.0	1.9%	112.8%
2002	9.4	-6.5%	105.4%
2003	9.9	6.0%	111.8%
<b>Average</b>	<b>8.9</b>		
<b>Average minus upper (**) and lower (*) points</b>	<b>9.0</b>		

Year	Percentage of Average	Rank
<b>1996**</b>	128.2%	1
1995	127.2%	2
1994	118.0%	3
1990	116.4%	4
<b>2001</b>	<b>112.8%</b>	<b>5</b>
2003	111.8%	6
2000	110.7%	7
1999	108.1%	8
1987	107.7%	9
1992	107.6%	10
<b>2002</b>	<b>105.4%</b>	<b>11</b>
1985	105.1%	12
1988	104.4%	13
1998	103.2%	14
1983	99.1%	15
1993	98.8%	16
1989	98.7%	17
1991	93.9%	18
1980	92.7%	19
1997	90.7%	20
1986	88.8%	21
1982	84.7%	22
1984	75.4%	23
1979	74.9%	24
<b>1981*</b>	49.7%	25

Peach yields for 2001 were 112.8% of the calculated average and ranked in the top yields. Yield for 2002 was 105.4% of the calculated average. However, yield levels for both years are very close to the linear trend line.



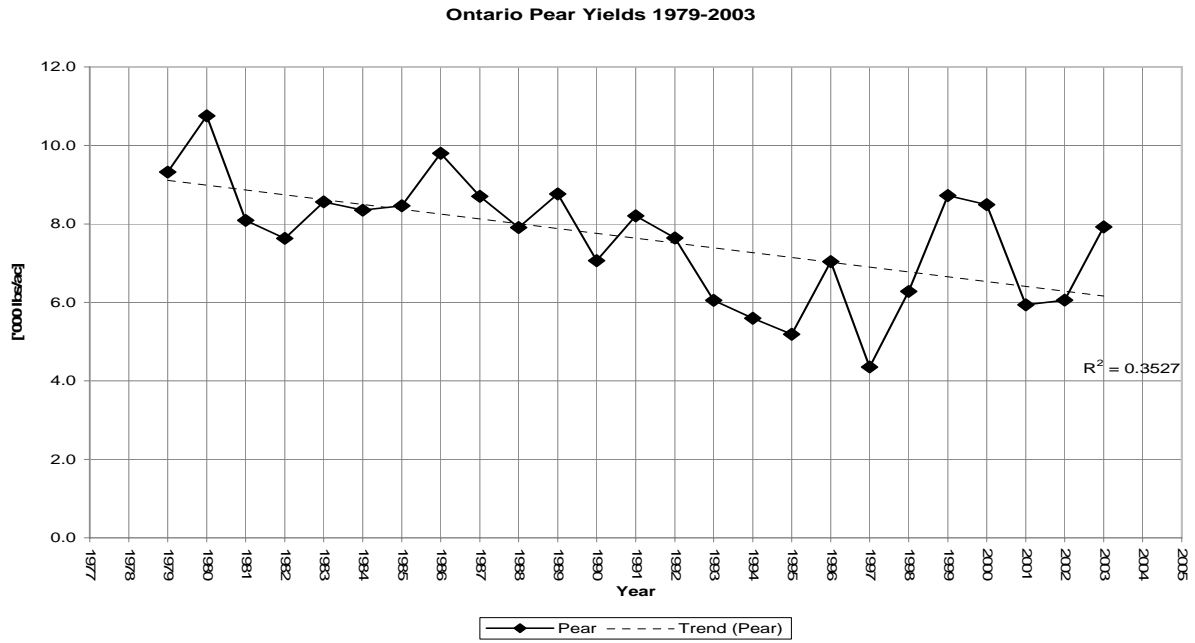
## Ontario Fruit Yields - 1979-2003

### Pears

Year	Pears ('000 lbs/ac)	% Change from previous year	Percentage of Average
1979	9.3	N/A	122.6%
<b>1980**</b>	<b>10.8</b>	<b>15.4%</b>	<b>141.5%</b>
1981	8.1	-24.8%	106.5%
1982	7.6	-5.7%	100.4%
1983	8.6	12.2%	112.6%
1984	8.3	-2.5%	109.9%
1985	8.5	1.3%	111.3%
1986	9.8	15.8%	128.9%
1987	8.7	-11.2%	114.5%
1988	7.9	-9.1%	104.1%
1989	8.8	10.8%	115.3%
1990	7.1	-19.4%	93.0%
1991	8.2	16.1%	108.0%
1992	7.6	-6.9%	100.6%
1993	6.1	-20.8%	79.6%
1994	5.6	-7.5%	73.6%
1995	5.2	-7.3%	68.3%
1996	7.0	35.6%	92.6%
<b>1997*</b>	<b>4.4</b>	<b>-38.1%</b>	<b>57.3%</b>
1998	6.3	44.2%	82.6%
1999	8.7	38.9%	114.8%
2000	8.5	-2.6%	111.7%
2001	5.9	-30.1%	78.1%
2002	6.1	2.1%	79.7%
2003	7.9	30.8%	104.3%
<b>Average</b>	<b>7.6</b>		
<b>Average minus upper (**) and lower (*) points</b>	<b>7.6</b>		

Year	Percentage of Average	Rank
1980	141.5%	1
1986	128.9%	2
1979	122.6%	3
1989	115.3%	4
1999	114.8%	5
1987	114.5%	6
1983	112.6%	7
2000	111.7%	8
1985	111.3%	9
1984	109.9%	10
1991	108.0%	11
1981	106.5%	12
2003	104.3%	13
1988	104.1%	14
1992	100.6%	15
1982	100.4%	16
1990	93.0%	17
1996	92.6%	18
1998	82.6%	19
<b>2002</b>	<b>79.7%</b>	<b>20</b>
1993	79.6%	21
<b>2001</b>	<b>78.1%</b>	<b>22</b>
1994	73.6%	23
1995	68.3%	24
1997	57.3%	25

Yield for *Pears* in 2001 were 78.1% of the long-term average while yields in 2002 rose slightly to 79.7% of the calculated average. Both 2001 and 2002 are below the trend line. The decline in yield from 2000 to 2001 is very substantial, but it is uncertain whether drought conditions in 2001 were responsible for the sharp decline. In 2000, pear yield was 85,000 [lbs/ac] and it dropped to 59,000 [lbs/ac] in 2001 which represents a 30% decrease.



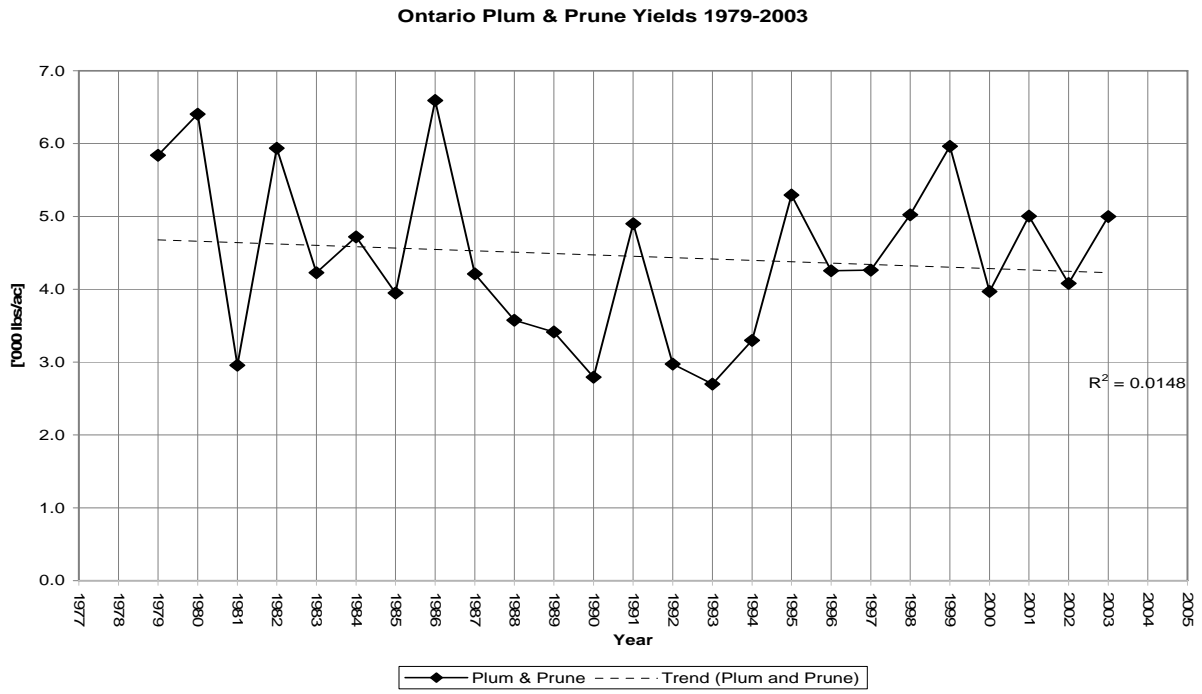
## Ontario Fruit Yields - 1979-2003

### Plums and Prunes

Year	Plums & Prunes ('000 lbs/ac)	% Change from previous year	Percentage of Average
1979	5.8	N/A	129.8%
1980	6.4	9.6%	142.3%
1981	3.0	-53.8%	65.7%
1982	5.9	100.7%	131.9%
1983	4.2	-28.8%	93.9%
1984	4.7	11.6%	104.9%
1985	3.9	-16.3%	87.8%
<b>1986**</b>	<b>6.6</b>	<b>66.9%</b>	<b>146.5%</b>
1987	4.2	-36.1%	93.6%
1988	3.6	-15.1%	79.4%
1989	3.4	-4.5%	75.9%
1990	2.8	-18.1%	62.1%
1991	4.9	75.4%	108.9%
1992	3.0	-39.3%	66.1%
<b>1993*</b>	<b>2.7</b>	<b>-9.2%</b>	<b>60.0%</b>
1994	3.3	22.2%	73.3%
1995	5.3	60.5%	117.6%
1996	4.3	-19.6%	94.5%
1997	4.3	0.2%	94.7%
1998	5.0	17.9%	111.6%
1999	6.0	18.7%	132.5%
2000	4.0	-33.4%	88.2%
2001	5.0	26.1%	111.2%
2002	4.1	-18.5%	90.7%
2003	5.0	22.5%	111.1%
<b>Average</b>	<b>4.5</b>		
<b>Average minus upper (**) and lower (*) points</b>	<b>4.4</b>		

Year	Percentage of Average	Rank
1986	146.5%	1
1980	142.3%	2
1999	132.5%	3
1982	131.9%	4
1979	129.8%	5
1995	117.6%	6
1998	111.6%	7
<b>2001</b>	<b>111.2%</b>	<b>8</b>
2003	111.1%	9
1991	108.9%	10
1984	104.9%	11
1997	94.7%	12
1996	94.5%	13
1983	93.9%	14
1987	93.6%	15
<b>2002</b>	<b>90.7%</b>	<b>16</b>
2000	88.2%	17
1985	87.8%	18
1988	79.4%	19
1989	75.9%	20
1994	73.3%	21
1992	66.1%	22
1981	65.7%	23
1990	62.1%	24
1993	60.0%	25

Plum and Prune yields were 111.2% and 90.7% of the calculated average in 2001 and 2002 respectively. The decline from 2001 to 2002 represents a 19% drop. The yield value from 2001 is above the trend line while 2002 is below and can be seen in the following graph.



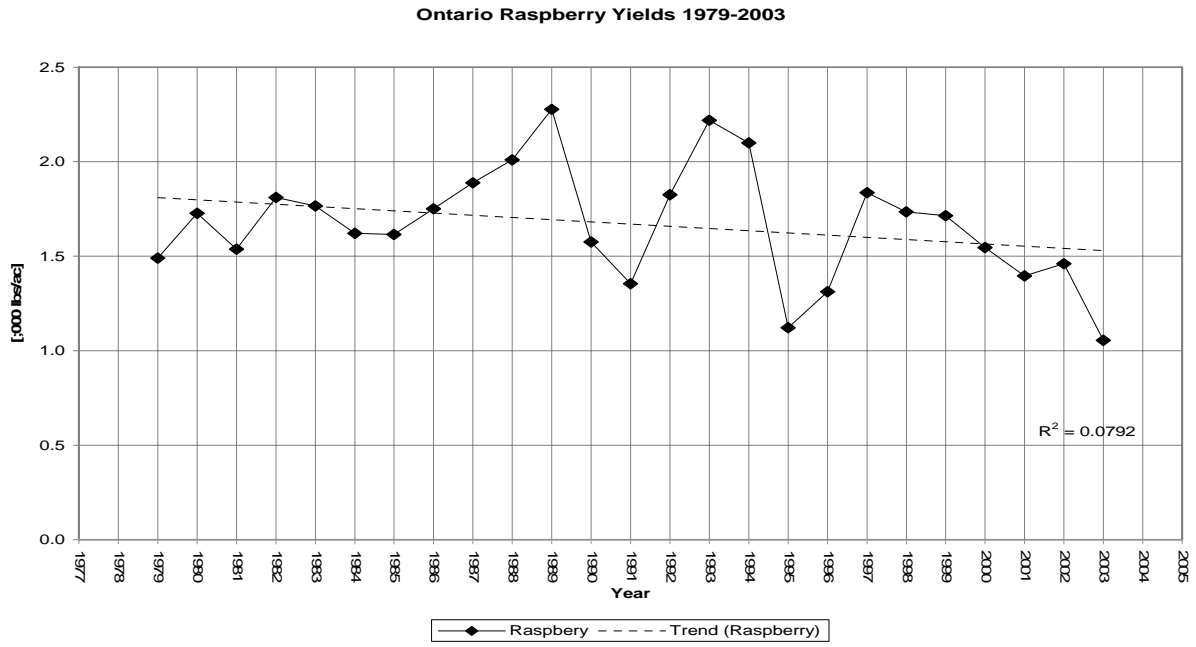
## Ontario Fruit Yields - 1979-2003

### Raspberries

Year	Raspberries ('000 lbs/ac)	% Change from previous year	Percentage of Average
1979	1.5	N/A	87.7%
1980	1.7	15.9%	101.6%
1981	1.5	-11.0%	90.5%
1982	1.8	17.8%	106.5%
1983	1.8	-2.5%	103.9%
1984	1.6	-8.2%	95.4%
1985	1.6	-0.4%	95.0%
1986	1.8	8.5%	103.0%
1987	1.9	7.8%	111.1%
1988	2.0	6.4%	118.2%
<b>1989**</b>	<b>2.3</b>	<b>13.3%</b>	<b>133.9%</b>
1990	1.6	-30.8%	92.7%
1991	1.4	-14.1%	79.6%
1992	1.8	34.8%	107.4%
1993	2.2	21.6%	130.6%
1994	2.1	-5.4%	123.5%
1995	1.1	-46.6%	66.0%
1996	1.3	17.0%	77.2%
1997	1.8	40.0%	108.0%
1998	1.7	-5.6%	102.0%
1999	1.7	-1.1%	100.9%
2000	1.5	-9.9%	90.9%
2001	1.4	-9.6%	82.1%
2002	1.5	4.6%	85.9%
<b>2003*</b>	<b>1.1</b>	<b>-27.8%</b>	<b>62.0%</b>
<b>Average</b>	<b>1.7</b>		
<b>Average minus upper (**) and lower (*) points</b>	<b>1.7</b>		

Year	Percentage of Average	Rank
1989	133.9%	1
1993	130.6%	2
1994	123.5%	3
1988	118.2%	4
1987	111.1%	5
1997	108.0%	6
1992	107.4%	7
1982	106.5%	8
1983	103.9%	9
1986	103.0%	10
1998	102.0%	11
1980	101.6%	12
1999	100.9%	13
1984	95.4%	14
1985	95.0%	15
1990	92.7%	16
2000	90.9%	17
1981	90.5%	18
1979	87.7%	19
<b>2002</b>	<b>85.9%</b>	<b>20</b>
<b>2001</b>	<b>82.1%</b>	<b>21</b>
1991	79.6%	22
1996	77.2%	23
1995	66.0%	24
2003	62.0%	25

Raspberry yields for 2001 were 82.1% of the long-term average and ranked among the worst years (21<sup>st</sup>) while yield 2002 yields were 85.9% of the long-term average and ranked 20<sup>th</sup>. Yield for both years are below the trend line and 2001 is the lowest point of a downward trend that started in 1997. However, it is uncertain whether drought conditions in 2001 and 2002 contributed to the decline in yields.



## Ontario Fruit Yields - 1979-2003

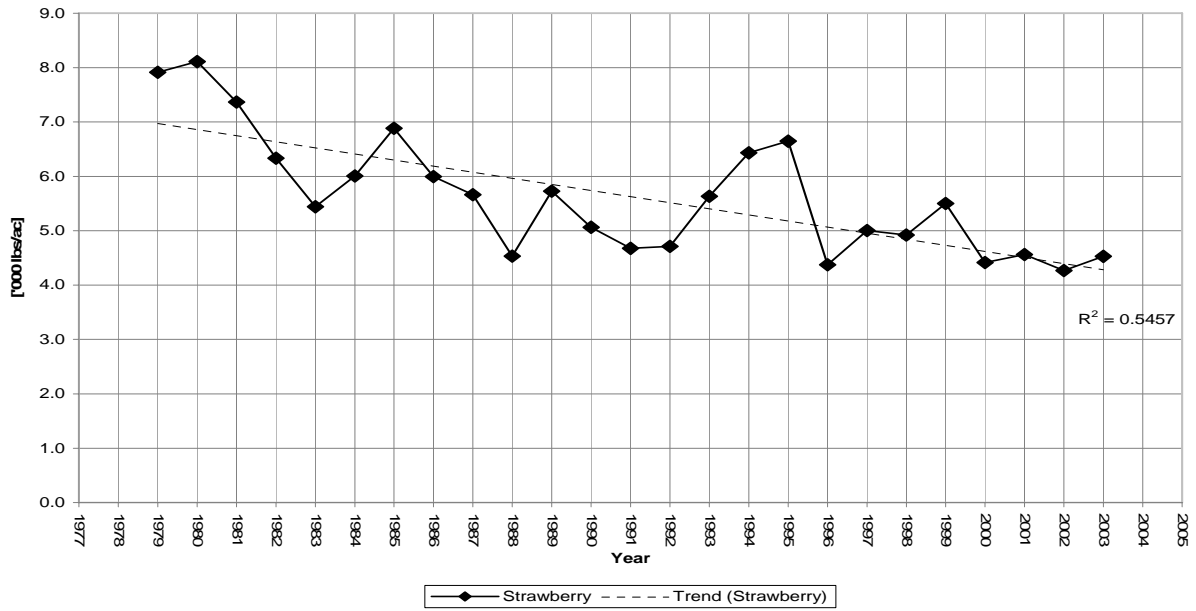
### Strawberries

Year	Strawberries ('000 lbs/ac)	% Change from previous year	Percentage of Average
1979	7.9	N/A	141.3%
<b>1980**</b>	<b>8.1</b>	<b>2.5%</b>	<b>144.8%</b>
1981	7.4	-9.1%	131.6%
1982	6.3	-14.0%	113.1%
1983	5.4	-14.1%	97.2%
1984	6.0	10.4%	107.3%
1985	6.9	14.6%	123.0%
1986	6.0	-12.9%	107.0%
1987	5.7	-5.5%	101.1%
1988	4.5	-19.9%	81.0%
1989	5.7	26.3%	102.2%
1990	5.1	-11.6%	90.4%
1991	4.7	-7.6%	83.5%
1992	4.7	0.8%	84.2%
1993	5.6	19.4%	100.6%
1994	6.4	14.2%	114.9%
1995	6.6	3.4%	118.7%
1996	4.4	-34.2%	78.1%
1997	5.0	14.5%	89.4%
1998	4.9	-1.7%	87.9%
1999	5.5	11.7%	98.2%
2000	4.4	-19.8%	78.8%
2001	4.6	3.4%	81.5%
<b>2002*</b>	<b>4.3</b>	<b>-6.4%</b>	<b>76.2%</b>
2003	4.5	6.1%	80.9%
<b>Average</b>	<b>5.6</b>		
<b>Average minus upper (**) and lower (*) points</b>	<b>5.6</b>		

Year	Percentage of Average	Rank
1980	144.8%	1
1979	141.3%	2
1981	131.6%	3
1985	123.0%	4
1995	118.7%	5
1994	114.9%	6
1982	113.1%	7
1984	107.3%	8
1986	107.0%	9
1989	102.2%	10
1987	101.1%	11
1993	100.6%	12
1999	98.2%	13
1983	97.2%	14
1990	90.4%	15
1997	89.4%	16
1998	87.9%	17
1992	84.2%	18
1991	83.5%	19
<b>2001</b>	<b>81.5%</b>	<b>20</b>
1988	81.0%	21
2003	80.9%	22
2000	78.8%	23
1996	78.1%	24
<b>2002</b>	<b>76.2%</b>	<b>25</b>

Strawberry yields for 2001 were 81.5% of the long-term average and ranked among the worst yield years (20<sup>th</sup>) and yields for 2002 dropped to 76.2% of the long-term average and 25<sup>th</sup>, the worst year for strawberry yield. In this case, the data point from 2002 was not included in the graph but is visible in the above tables.

Ontario Strawberry Yields 1979-2003



## Ontario Fruit Yields - 1979-2003

### Other Fruits

Year	Other fruits ('000 lbs/ac)	% Change from previous year	Percentage of Average
<b>1979**</b>	<b>14.2</b>	<b>N/A</b>	<b>165.3%</b>
1980	8.6	-39.8%	99.5%
1981	9.5	11.5%	110.9%
1982	10.1	5.7%	117.3%
1983	11.0	9.2%	128.1%
1984	10.3	-6.2%	120.2%
1985	8.0	-22.8%	92.7%
1986	6.6	-17.7%	76.3%
1987	6.7	1.8%	77.6%
1988	7.6	13.3%	88.0%
1989	7.7	1.8%	89.5%
<b>1990*</b>	<b>4.2</b>	<b>-46.1%</b>	<b>48.3%</b>
1991	5.0	19.2%	57.6%
1992	4.5	-8.3%	52.8%
1993	6.4	40.9%	74.4%
1994	6.7	4.6%	77.8%
1995	7.4	10.1%	85.7%
1996	6.8	-8.2%	78.7%
1997	7.8	15.1%	90.5%
1998	8.0	2.9%	93.1%
1999	11.4	42.0%	132.3%
2000	10.2	-10.4%	118.5%
2001	10.8	6.1%	125.7%
2002	14.2	31.1%	164.8%
2003	11.4	-19.3%	133.0%
<b>Average</b>	<b>8.6</b>		
<b>Average minus upper (**) and lower (*) points</b>	<b>8.5</b>		

Year	Percentage of Average	Rank
1979	165.3%	1
<b>2002</b>	<b>164.8%</b>	<b>2</b>
2003	133.0%	3
1999	132.3%	4
1983	128.1%	5
<b>2001</b>	<b>125.7%</b>	<b>6</b>
1984	120.2%	7
2000	118.5%	8
1982	117.3%	9
1981	110.9%	10
1980	99.5%	11
1998	93.1%	12
1985	92.7%	13
1997	90.5%	14
1989	89.5%	15
1988	88.0%	16
1995	85.7%	17
1996	78.7%	18
1994	77.8%	19
1987	77.6%	20
1986	76.3%	21
1993	74.4%	22
1991	57.6%	23
1992	52.8%	24
1990	48.3%	25

Yield for *Other Fruits* remained very high in 2001 and 2002. The yield value for 2001 was 125.7% of the calculated average and ranked sixth highest, while the yield value for 2002 was 164.8% of the calculated average and ranked as the second highest yield year.

Ontario Other Fruit Yields 1979-2003



## Ontario Fruit Yields - 1979-2003

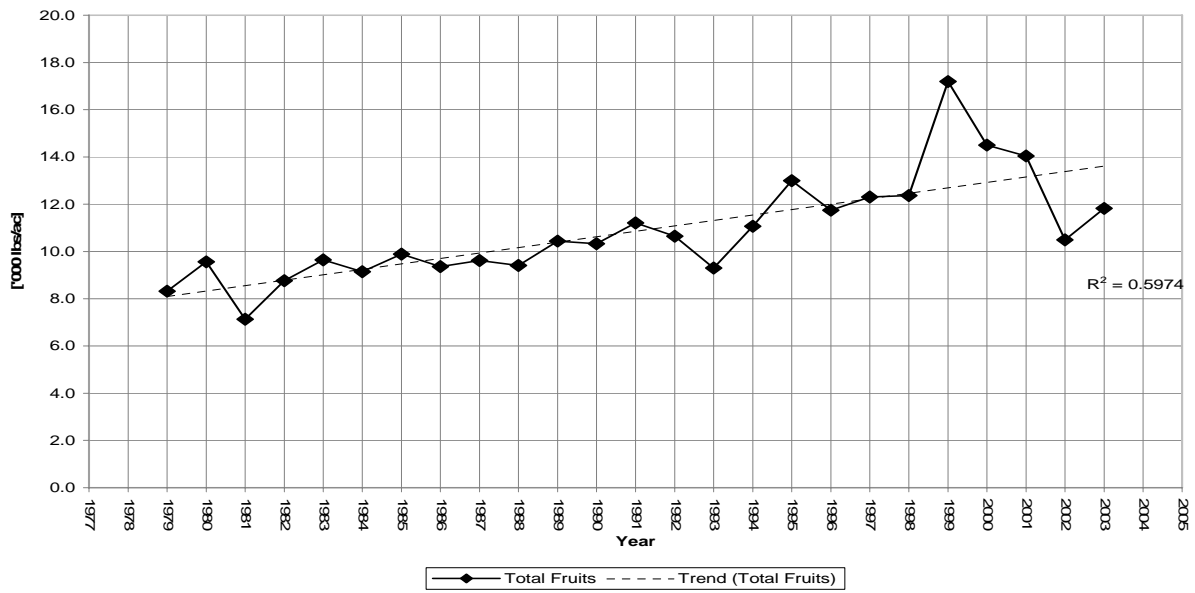
### Total Fruits

Year	Total ('000 lbs/ac)	% Change from previous year	Percentage of Average
1979	8.3	N/A	76.3%
1980	9.6	14.9%	87.7%
<b>1981*</b>	<b>7.1</b>	<b>-25.4%</b>	<b>65.4%</b>
1982	8.8	22.9%	80.4%
1983	9.6	10.0%	88.5%
1984	9.1	-5.2%	83.9%
1985	9.9	8.1%	90.7%
1986	9.4	-5.3%	85.9%
1987	9.6	2.8%	88.3%
1988	9.4	-2.2%	86.3%
1989	10.4	10.9%	95.8%
1990	10.3	-1.1%	94.8%
1991	11.2	8.6%	102.9%
1992	10.7	-5.0%	97.7%
1993	9.3	-12.7%	85.3%
1994	11.1	19.0%	101.5%
1995	13.0	17.4%	119.2%
1996	11.7	-9.6%	107.8%
1997	12.3	4.8%	112.9%
1998	12.4	0.5%	113.5%
<b>1999**</b>	<b>17.2</b>	<b>39.0%</b>	<b>157.7%</b>
2000	14.5	-15.6%	133.1%
2001	14.0	-3.2%	128.8%
2002	10.5	-25.3%	96.2%
2003	11.8	12.7%	108.4%
<b>Average</b>	<b>10.9</b>		
<b>Average minus upper (**) and lower (*) points</b>	<b>10.7</b>		

Year	Percentage of Average	Rank
1999	157.7%	1
2000	133.1%	2
<b>2001</b>	<b>128.8%</b>	<b>3</b>
1995	119.2%	4
1998	113.5%	5
1997	112.9%	6
2003	108.4%	7
1996	107.8%	8
1991	102.9%	9
1994	101.5%	10
1992	97.7%	11
<b>2002</b>	<b>96.2%</b>	<b>12</b>
1989	95.8%	13
1990	94.8%	14
1985	90.7%	15
1983	88.5%	16
1987	88.3%	17
1980	87.7%	18
1988	86.3%	19
1986	85.9%	20
1993	85.3%	21
1984	83.9%	22
1982	80.4%	23
1979	76.3%	24
1981	65.4%	25

Yield for *Total Fruits* remained very high in 2001. The yield value for 2001 was 128.8% of the calculated average and ranked third highest. However, the yield value for 2002 was 96.2% of the calculated average and ranked the 12<sup>th</sup> highest yield year. The decline from 2001 to 2002 represents a decline of 25%. Yield for 2001 is above the trend line while yield for 2002 is below.

Total Ontario Fruit Yields 1979-2003



## Conclusions

Fruit yields that were below the linear trend line for the years of 2001 and 2002 were: apples (2002), sour cherry (2001, 2002), sweet cherries (2002), peaches (2001, 2002), pears (2001, 2002), plum and prunes (2002), raspberries (2001, 2002), strawberries (2002) and total fruits (2002).

Fruit yields that were ranked in the bottom five (21<sup>st</sup> – 25<sup>th</sup>) in the long term series were: sour cherries 2001 (23<sup>rd</sup>), sour cherries 2002 (22<sup>nd</sup>), sweet cherries 2002 (24<sup>th</sup>), raspberries 2001 (21<sup>st</sup>) and strawberries 2002 (25<sup>th</sup>).

Crop yields below the linear trend line and yield rankings in the bottom five are indicators of low yields. However, *the percentage change of previous year*, highlighted in the following tables, may be more useful in identifying sudden substantial declines.

### Provincial Yield: Percentage Change from Previous Year for 2001 and 2002

Year	Apples	Cherries, Sour	Cherries, Sweet	Grapes	Peaches	Pears
<b>2000</b>	-13.8%	-28.3%	-27.2%	-15.3%	2.4%	-2.6%
<b>2001</b>	0.5%	<b>-34.8%</b>	10.8%	2.9%	1.9%	<b>-30.1%</b>
<b>2002</b>	<b>-33.8%</b>	7.1%	<b>-53.5%</b>	1.3%	<b>-6.5%</b>	2.1%

Year	Plums & Prunes	Raspberries	Strawberries	Other Fruits	Total Fruits
<b>2000</b>	-33.4%	-9.9%	-19.8%	-10.4%	-15.6%
<b>2001</b>	26.1%	<b>-9.6%</b>	3.4%	6.1%	-3.2%
<b>2002</b>	<b>-18.5%</b>	4.6%	<b>-6.4%</b>	31.1%	<b>-25.3%</b>

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## **Glossary**

Ac – Acre

Lbs - pounds

OMAFRA - Ontario Ministry of Agriculture Food and Rural Affairs

CAR – Census Agricultural Region