



VISION

Ontario Apples...a healthy consumer...a healthy industry.

MISSION

To foster a viable apple industry through advocacy with government and collaboration with partners for the health of consumers and the wealth of producers.

FIFTEENTH ANNUAL REPORT OF THE ONTARIO APPLE GROWERS

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CHAIR'S REPORT



As I sit down to write my 2018 report, the year reminds me of my favourite hydrangea variety; Endless Summer. The weather, this year, has really made harvest interesting. While helping some varieties like Ambrosia and Gala, it has hindered others like Honeycrisp. The maturity of apples was late in most areas in Ontario resulting in a smaller window of opportunity to harvest. For myself, between September $20^{th} - 22^{nd}$, I did not pick apples. In my 44 years of growing apples this has never happened. Most growers in Ontario lost between 10-50% of their Honeycrisp crop, due to drop, as a result of this year's weather phenomena. The weather has resulted in exceptional flavor though and overall Ontario will end up with a good crop in both volume and quality.

Over the last ten years, the apple industry has been going through a metamorphosis. We have gone from an industry of low capitalization to one that is very high. This is a result of mechanization, thus reducing our labour costs, the demand for better quality and the push to produce better yields putting extreme stress on our apple farmers (both those established and those new to apple farming) as they deal with the huge capital costs of planting new high-density orchards. There is also the added stress while waiting the 6 years for the new plantings to finally become profitable. Our apple acreage has remained stagnant for many years and will remain so if we can't find a solution to this situation.

The OAG has been actively looking for ways to assist farmers and encourage orchard planting. We are pleased to have received some funding, in partnership with the Ontario Tender Fruit Growers and Fresh Grape Growers, to offer a Tree & Vine Grant Funding Program for the current year. This program is providing up to a maximum of 30% of the tree cost for tree fruit and fresh grape vines. The OAG Board will continue to investigate options to assist our members whenever and wherever possible so that we all may grow and thrive in this competitive sector.

Two important things are needed by apple farmers to produce a good crop. They need crop protection materials to combat the 75 disease and insects that attack the crop and an economical way of dealing with crop load management. The PMRA re-evaluation process has been devastating to both these requirements. We have limited use of our number one chemical thinner, Sevin, and PMRA's final decision on Captan now restricts the use to two sprays on 'non-high density' orchards. These orchards still account for a very large portion of acreage in Ontario. With the loss of Metiram and the pending re-evaluation of Mancozeb, we will be out of 'M' group fungicides that are used to aid in combating resistance with almost all new fungicides. In the next month or so, apple farmers from across Canada will be asked to provide a letter to describe how the loss of Mancozeb will affect your business. Please take the time to write this letter as it may be the most important thing that you do to save these crop protection materials.

Looking at the bigger picture, we know that PMRA operates under strict Health Canada regulations and we also know that the re-evaluation process is not sustainable in its current format for either PMRA or farmers. There are regulations and policies that need to be changed at PMRA. To make this happen we will be working very closely with our national industry partners to lobby for meaningful changes to the system for the betterment of the entire horticulture sector. This will take time.

As you know, we have a new provincial government that has recently capped the minimum wage at \$14.00/hour for now. We are still waiting to hear what the government plans to do with the other new

labour regulations put in place by the previous government. This new government is very engaged in cutting regulations that inhibit our business, so now is the time to send us your comments on those regulations that restrict your business's growth, that don't make sense or that create duplication.

It has been a pleasure working with your Board of Directors over the past year on issues such as crop insurance, research, new variety development, promotion and so many other topics. I could not ask for a better board to be a part of and I thank them for their dedication. They have made my job easy. It is important to lend the apple voice to the many associations and organizations and we are fortunate to have knowledgeable farmers participate. I would also like to thank all the OAG staff and a special thanks to Kelly Ciceran. Our staff team has worked hard on your behalf this year and a highlight certainly was the exceptional job they did planning our Apple Academy last January.

On behalf of all Ontario apple farmers I would like to acknowledge and thank our many funding partners. The OAG has been fortunate to receive funding from *Growing Forward 2*, a federal-provincial-territorial initiative. The Agricultural Adaptation Council assists in the delivery of GF2 in Ontario. Additionally, we acknowledge the support and thank the Apple Marketers' Association of Ontario, Horticulture Crops Ontario, the Georgian Bay Fruit Growers' Association and Ontario Fruit and Vegetable Growers' Association.

In closing, I ask you to mark your calendars for July 21 - 24, 2019 as Ontario has the privilege of hosting the International Tree Fruit Association's (IFTA) Summer Study Tour.

Respectfully submitted,

Charles R. Stevens

Chair, OAG



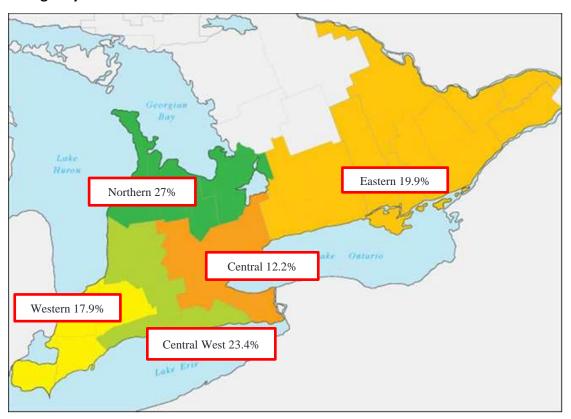
ONTARIO APPLE GROWERS

ACREAGE REVIEW

Tree Census

Tree census information (as of January 1st, 2018) is included on pages 12 and 13. This information is based on Agricorp's GPS mapping and information on total acreage provided by Statistics Canada. Agricorp continues to manage the DMS system in partnership with the OAG. The system provides reports on plantings by age, by variety and by district for all OAG members. Statistics Canada estimated that there is a total of 15,596 bearing and non-bearing acres in Ontario in 2015. The assumption has been made that the variety mix for the remaining acres were about the same as for those that were mapped.

Ontario Acreage by District



District Boundaries

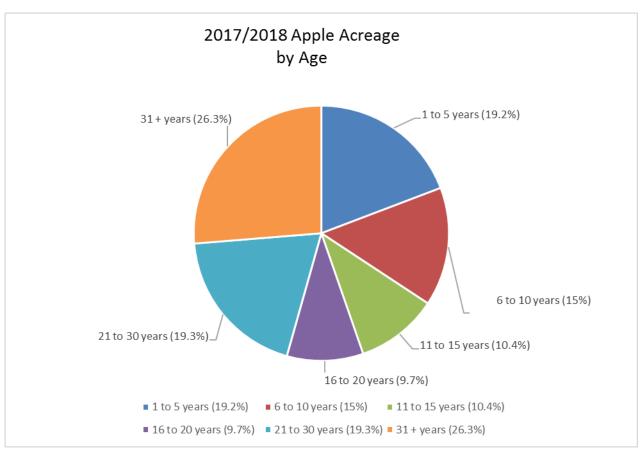
District 1 Western is comprised of the upper-tier municipalities of Essex, Lambton & Middlesex and the single-tier municipality of Chatham-Kent.

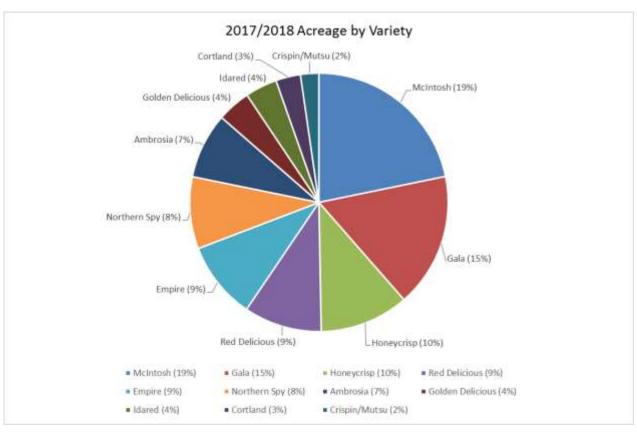
District 2 Central West is comprised of the upper-tier municipalities of Huron, Perth, Oxford & Elgin and the single-tier municipalities of Haldimand and Norfolk.

District 3 Northern is comprised of the upper-tier municipalities of Bruce, Grey, Simcoe and Dufferin.

District 4 Central is comprised of the upper-tier municipalities of Wellington, Peel, York, Halton, Waterloo and Niagara and the single tier-municipalities of Brant, Toronto and Hamilton.

District 5 Eastern is comprised of the upper-tier municipalities of Durham, Northumberland, Peterborough, Frontenac, Hastings, Lannark, Lennox & Addington, Leeds & Grenville, Renfrew & Stormont, Dundas & Glengarry & Prescott & Russell and the single-tier municipalities of Kawartha Lakes, Ottawa and Prince Edward.

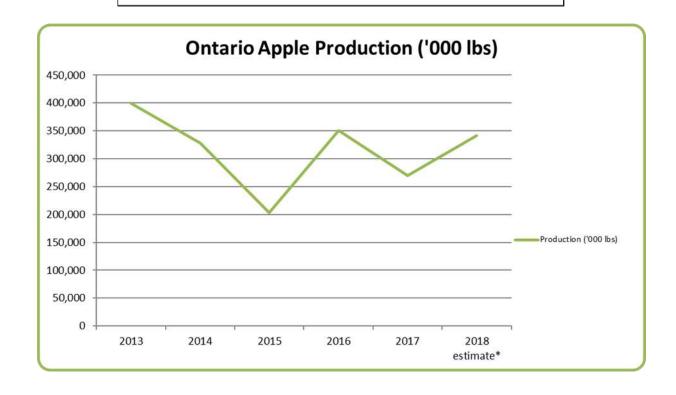




CROP ESTIMATE

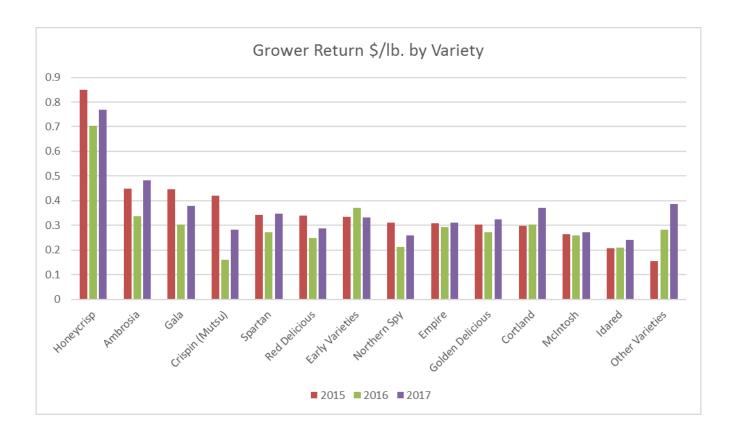
Ontario A	pple Production – 201	3 TO 2018
	Production ('000 lbs)	% Change From Previous Year
2013	399,506	532.7%
2014	328,204	-17.8%
2015	203,533	-38.0%
2016	350,435	72.2%
2017	269,513	-23.1%
2018 estimate*	341,823	26.8%
5 Yr Avg ('13 -'17)	310,238	

Source: OAG Annual Apple Marketing Survey and Apple Yield Estimate Survey
* November 2018 estimate and excludes orchard juice estimated volumes at this time



MARKETING REVIEW

The results of the 2017 marketing survey include comparative figures from the 2016 year begin on page 9. The survey provides the industry average returns per pound and per bin (820 lbs.) by variety and represents the prices for 100% of the apples in the bin, not just those for the fresh market pack out. With this information, growers and packers can compare their results with the average. This information also provides valuable information for government programming.



Flyer Ad Tracking

The OAG tracks apple flyer ad activity at major retail. We record retail chain, variety, pack (bulk or bag), price/lb. and country of origin. This information is shared with the apple packers on a weekly basis.

Storage Holdings

The OAG continues to collect storage holdings for the industry. As always, individual storage holder data is kept confidential. Similar information is collected in other apple producing provinces. This information is entered into AAFC's InfoHort system and published on their website. The OAG summarizes the Canadian data and combines it with similar statistics on the U.S. crop and provides it to the marketers, storage holders and our grower members. The OAG thanks all the storage cooperators for their excellent participation.

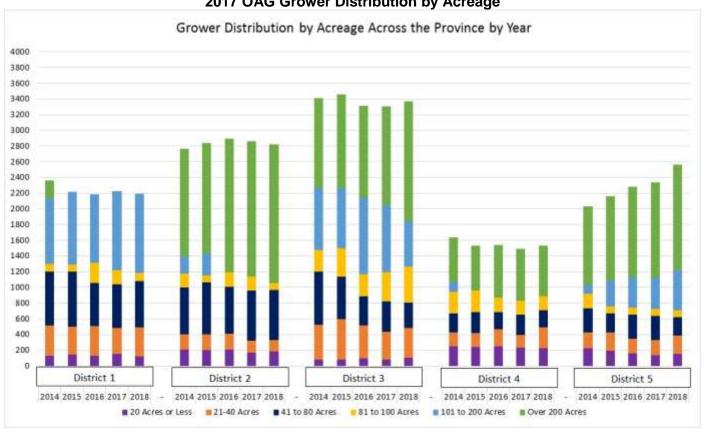


2018 OAG MEMBERSHIP

Each District has a District Apple Producers' Committee and each District may elect one committee person for each 20 growers. If the District is not a multiple of 20, then there shall be one grower representative for each 20 growers plus one additional representative. On or before December 31st of each year, each District Apple Producers' Committee will elect two members to the board of directors of the Ontario Apple Growers. Based on the current membership, the number of growers to be elected to the District Committees is as follows:

District	Grower Members	District Committee Representatives
District 1	38	3
District 2	33	3
District 3	38	3
District 4	32	3
District 5	30	3
Total - Members	171	15
Voluntary Members	53	
Total - All Members	224	





APPLE STATISTICS

APPLE CROP ESTIMATE

	ONTA	ARIO APPLE GROV	VERS								
JULY 2018 ESTIMATED APPLE YIELD BY VARIETY											
			July 2018	July 2018							
			Estimated	Estimated							
	2016 Production	2017 Production	Production	Production	% Change						
Variety	('000 lbs)	('000 lbs)	('000 lbs)	('000 bushels)	2018 vs. 2017						
Other Early Varieties	6,512	5,650	7,326	174	29.7%						
Ambrosia	14,544	13,640	16,558	394	21.4%						
Cortland	8,310	6,265	8,749	208	39.6%						
Crispin/Mutsu	2,527	2,731	2,176	52	-20.3%						
Empire	46,881	32,807	41,540	989	26.6%						
Fuji	2,403	1,665	2,017	48	21.1%						
Gala	41,134	37,894	49,701	1,183	31.2%						
Golden Delicious	9,460	7,089	7,930	189	11.9%						
Honeycrisp	24,596	19,438	30,153	718	55.1%						
Idared	7,177	5,236	6,728	160	28.5%						
McIntosh	57,252	51,942	54,422	1,296	4.8%						
Northern Spy	46,389	29,397	39,900	950	35.7%						
Red Delicious	26,585	19,395	24,775	590	27.7%						
Spartan	5,248	4,313	4,763	113	10.5%						
Other Late Varieties	6,928	7,895	11,681	278	48.0%						
Total Fresh	305,947	245,357	308,419	7,343	25.7%						

^{*}Note – Shows July 2018 estimate as the November 2018 crop estimate delayed due to later harvest in Ontario.



2017 ONTARIO APPLE PRODUCTION BY UTILIZATION

PRODUCTION (LBS.)								
Variety	Fre	Fresh		Orchard Juice*		ocessing	Total	
	2017	2016	2017	2016	2017	2016	2017	2016
Ambrosia	13,640,043	14,462,519			0	80,981	13,640,043	14,543,500
Cortland	6,199,879	7,701,294			65,391	609,086	6,265,270	8,310,380
Crispin (Mutsu)	2,314,583	1,971,151			416,040	555 <i>,</i> 779	2,730,623	2,526,930
Early Varieties	5,107,821	6,511,900			541,961	0	5,649,782	6,511,900
Empire	30,476,898	44,550,745			2,330,549	2,330,715	32,807,447	46,881,460
Fuji	1,301,516	1,736,698			363,715	666,522.0	1,665,231	2,403,220
Gala	37,663,627	41,055,168			230,635	78,942	37,894,262	41,134,110
Golden Delicious	6,889,620	9,062,584			198,947	397,256	7,088,567	9,459,840
Honeycrisp	19,433,355	24,595,660			4,998	-	19,438,353	24,595,660
Idared	128,395	914,076			5,107,228	6,262,814	5,235,623	7,176,890
McIntosh	40,807,655	47,403,872			11,134,410	9,848,288	51,942,065	57,252,160
Northern Spy	18,624,834	24,995,964			10,772,474	21,393,506	29,397,308	46,389,470
Red Delicious	19,120,709	26,172,045			274,615	412,915	19,395,324	26,584,960
Spartan	3,768,573	4,155,098			544,102	1,093,092	4,312,675	5,248,190
Other Varieties	4,335,834	3,728,921			3,558,698	3,199,209	7,894,532	6,928,130
Total	209,813,342	259,017,695	24,118,000	44,488,444	35,543,763	46,929,105	269,475,105	350,435,244

^{*}Orchard Juice represents apples picked specifically for juice from Ontario orchards and includes cider processing.

2017 ONTARIO APPLE GROWER PRICE PER LB.

GROWER PRICE (\$/LB)										
	Net I	Return/	Fre	sh	Orchard Juic	e Processing	Other Pr	ocessing	Average I	resh and
Variety	820	Lb. Bin	(\$	(\$)		(\$)		5)	Other Processing (\$)	
	2	2017	2017	2016	2017	2016	2017	2016	2017	2016
Ambrosia	\$	395	0.482	0.339			0.135	0.115	0.480	0.338
Cortland	\$	307	0.374	0.315			0.211	0.164	0.363	0.304
Crispin (Mutsu)	\$	242	0.295	0.157			0.175	0.169	0.272	0.160
Early Varieties	\$	285	0.347	0.370			-	=	0.347	0.370
Empire	\$	264	0.323	0.301			0.167	0.152	0.311	0.294
Fuji	\$	300	0.366	0.366			0.178	0.178	0.325	0.314
Gala	\$	312	0.381	0.318			0.160	0.115	0.379	0.317
Golden Delicious	\$	270	0.329	0.279			0.169	0.115	0.324	0.273
Honeycrisp	\$	631	0.769	0.704			0.135	=	0.769	0.704
Idared	\$	281	0.342	0.318			0.239	0.194	0.241	0.210
McIntosh	\$	244	0.297	0.273			0.181	0.191	0.272	0.259
Northern Spy	\$	-	0.213	0.213			0.258	0.210	0.230	0.211
Red Delicious	\$	237	0.289	0.249			0.224	0.192	0.288	0.248
Spartan	\$	291	0.355	0.277			0.299	0.254	0.348	0.273
Other Varieties	\$	476	0.581	0.410			0.148	0.134	0.386	0.283
Avg. Grower Price -										
All Utilization (\$/lb)	\$	329	0.402	0.338	0.116	0.092	0.214	0.194	0.330	0.279
Avg. Transaction -										
All Utilization (\$/lb)			0.471	0.411	0.116	0.092	0.234	0.214	0.408	0.344

2017 ONTARIO APPLE GROWER VALUE

GROWER VALUE \$									
Variety	Fresh (\$)		Orchard	Orchard Juice (\$)		Other Processing (\$)		Total (\$)	
	2017	2016	2017	2016	2017	2016	2017	2016	
Ambrosia	6,537,171	4,907,874			8,828	9,313	6,545,999	4,917,187	
Cortland	2,189,449	2,429,218			87,823	100,064	2,277,272	2,529,283	
Crispin (Mutsu)	646,575	309,481			95,075	93,890	741,651	403,372	
Early Varieties	1,962,579	2,408,621			-	-	1,962,579	2,408,621	
Empire	9,829,469	13,424,131			389,306	354,564	10,218,774	13,778,695	
Fuji	476,678	636,217			64,852	118,900	541,529	755,117	
Gala	14,336,499	13,036,732			36,986	9,078	14,373,485	13,045,811	
Golden Delicious	2,265,585	2,532,886			33,608	45,684	2,299,193	2,578,570	
Honeycrisp	14,953,962	17,306,845			675	-	14,954,637	17,306,845	
Idared	43,940	290,305			1,219,053	1,214,830	1,262,993	1,505,135	
McIntosh	12,125,759	12,960,113			2,015,172	1,880,380	14,140,931	14,840,493	
Northern Spy	3,967,090	5,322,106			2,783,418	4,487,289	6,750,507	9,809,395	
Red Delicious	5,518,811	6,506,702			61,616	79,473	5,580,428	6,586,175	
Spartan	1,339,439	1,152,530			162,498	278,034	1,501,937	1,430,565	
Other Varieties	2,517,922	1,529,955			525,957	428,250	3,043,879	1,958,205	
Total Grower Value	78,710,928	84,753,716	2,807,349	4,092,937	7,484,865	9,099,751	89,003,142	97,946,404	
Total Transaction Value	98,802,140	106,382,157	2,807,349	4,092,937	8,320,991	10,042,828	109,930,479	120,517,922	

2017 Ontario Apple Tree Acreage By Variety, By District

					•		2017	2016
	1	2	3	4	5	Total	% of Total	% of Total
Variety Name	Western	Central West	Northern	Central	Eastern	Acreage	Crop	Crop
McIntosh	196	648	1,349	206	578	2,977	19.1%	18.7%
Gala	443	619	154	357	722	2,296	14.7%	14.7%
Honeycrisp	236	302	313	188	485	1,524	9.8%	9.6%
Red Delicious	314	386	89	251	295	1,335	8.6%	8.7%
Empire	285	561	194	109	179	1,328	8.5%	8.7%
Northern Spy	67	277	813	39	36	1,232	7.9%	7.7%
Ambrosia	310	231	208	145	228	1,122	7.2%	6.9%
Golden Delicious	287	116	8	117	45	573	3.7%	3.9%
Idared	94	117	253	20	65	548	3.5%	3.5%
Cortland	36	85	125	72	107	424	2.7%	3.0%
Other	64	66	245	73	76	524	3.4%	3.8%
Crispin/Mutsu	87	72	20	113	21	313	2.0%	2.2%
Spartan	10	36	145	16	43	250	1.6%	1.6%
Fuji	125	41	16	39	15	237	1.5%	1.5%
Paulared	43	35	29	20	91	220	1.4%	1.5%
Mixed	39	7	5	60	56	167	1.1%	1.0%
Ginger Gold	58	28	12	22	35	155	1.0%	0.6%
Crimson Crisp	0	2	75	9	8	94	0.6%	0.6%
Jonagold	34	23	9	25	1	92	0.6%	0.5%
Jerseymac	9	-	60	4	2	75	0.5%	0.4%
Golden Russet	15	3	14	7	22	62	0.4%	0.3%
Jonamac	36	1	7	4	0	48	0.3%	0.3%
TOTAL	2,790	3,656	4,142	1,899	3,109	15,596	100%	100%

Notes: Includes bearing and non-bearing acreage in Ontario.

Sources: Agricorp/OAG ADaMS DMS System and Statistics Canada, CANSIM Table 32-10-0364-01

See Ontario Apple Growing Regions section in this annual report for a more detailed description of Districts 1 to 5 above.

Other includes: Aurora Golden Gala, Braeburn, Cameo, Cox's Orange Pippin, Creston, Cripps Pink, Dabinett, Earligold, Elstar, Fortune, Goldrush, Granny Smith, Kingston Black, Liberty, Lobo, Lodi, Macoun, Marshall Mac, Mascad De Dieppe, Melba, Michelin, Novaspy, Porter's Perfection, Quinte, Red Prince, Rome, Roxbury Russet, Russet, Shizuka, Silken, Snow, Sunrise, Tolman Sweet, Transparent, Tydeman Red, Viking, Vista Bella, Wealthy, Winesap, Yarlington Mill and Zestar!.

2017 Ontario Apple Tree Acreage By Variety, By Tree Age

	1 To 5	6 To 10	11 To 15	16 To 20	21 To 30	31 Years and		
	Years	Years	Years	Years	Years	Over		2017
Variety Name	(2013-2017)	(2008-2012)	(2003-2007)	(1998-2002)	(1988-1997)	(Pre-1987)	Total Acreage	% of Total Crop
McIntosh	140	197	228	223	745	1,443	2,977	19.1%
Gala	901	695	250	223	188	39	2,296	14.7%
Honeycrisp	606	431	338	142	5	1	1,524	9.8%
Red Delicious	261	103	23	141	304	502	1,335	8.6%
Empire	14	59	51	119	598	487	1,328	8.5%
Northern Spy	6	82	54	166	371	554	1,232	7.9%
Ambrosia	563	309	229	21	0	-	1,122	7.2%
Golden Delicious	19	115	67	123	148	101	573	3.7%
Idared	19	4	11	17	103	394	548	3.5%
Other	90	85	227	40	43	40	524	3.4%
Cortland	63	80	30	60	84	107	424	2.7%
Crispin/Mutsu	13	30	44	83	65	78	313	2.0%
Spartan	6	11	3	17	89	123	250	1.6%
Fuji	94	50	20	11	49	13	237	1.5%
Paulared	55	35	4	12	32	81	220	1.4%
Mixed	7	9	27	19	64	41	167	1.1%
Ginger Gold	34	32	13	55	21	0	155	1.0%
Crimson Crisp	92	2	-	-	1	1	94	0.6%
Jonagold	10	10	3	13	48	8	92	0.6%
Jerseymac	-	-	2	2	33	39	75	0.5%
Golden Russet	4	4	1	22	15	17	62	0.4%
Jonamac	0	3	-	0	12	31	48	0.3%
TOTAL	2,998	2,346	1,625	1,510	3,016	4,100	15,596	100.0%

			GOLDEN	GRANNY			RED		
PROVINCE	EMPIRE	GALA	DELICIOUS	SMITH	IDA RED	MCINTOSH	DELICIOUS	UNSPECIFIED	TOTAL
Alberta		796,582	58,334	362,459			89,318	297,976	1,604,670
British Columbia		44,825,161	4,945,340	19,882,235	111,247		18,196,400	44,666,602	132,626,98
Manitoba		109,942	11,671	55,334		279,120	59,221	138,984	654,272
New Brunswick		207,662	22,745	42,644		11,069	57,351	269,678	611,149
Nova Scotia		1,098,924		35				1,336,604	2,435,563
Ontario		74,912,542	8,995,487	28,212,837	1,060,682	101,741	19,747,083	27,876,128	160,906,50°
Québec		5,716,236	374,446	7,656,557		699,156	1,133,554	5,048,776	20,628,724
Saskatchewan		183,369		39,771			1,120	451,297	675,557
Total By Variety		127,850,418	14,408,023	56,251,874	1,171,930	1,091,086	39,284,047	80,086,045	320,143,422
Ontario - 2016	564,661	83,284,884	8,212,781	29,047,800	840,820	127,822	24,407,721	28,912,987	175,399,475
Ontario - 2010	304,001	03,204,004	0,212,701	29,047,000	040,020	121,022	24,407,721	20,912,907	173,333,473
Ontario - 2017 vs. 2016	-100%	-10%	10%	-3%	26%	-20%	-19%	-4%	-8%
Total By Variety - 2016	714,453	141,826,626	13,949,274	60,492,317	840,820	311,217	45,681,461	75,840,451	339,656,62
Total By Variety -									
2017 vs. 2016	-100%	-10%	3%	-7%	39%	251%	-14%	6%	-6%

	IMPORTS OF FRESH APPLES - 5 YEAR AVERAGE 2013-2017 CROP YEARS (LBS)											
			GOLDEN	GRANNY			RED					
PROVINCE	EMPIRE	GALA	DELICIOUS	SMITH	IDA RED	MCINTOSH	DELICIOUS	UNSPECIFIED	TOTAL			
Alberta		1,393,228	52,751	300,109			184,020	386,286	2,316,394			
British Columbia	5,027	51,200,844	6,749,565	21,555,231	47,610	8,922	21,047,251	39,834,251	140,448,703			
Manitoba		304,005	22,209	67,864		274,190	59,017	121,572	848,858			
New Brunswick	28	355,678	88,568	191,883		9,851	149,775	217,198	1,012,981			
Nova Scotia		747,289		16,043				1,194,511	1,957,844			
Ontario	889,016	78,772,965	10,034,346	29,445,246	636,073	229,274	23,097,060	31,222,656	174,326,636			
Québec	685,580	11,129,859	1,294,682	8,669,497	269,257	870,630	2,433,181	6,576,974	31,929,660			
Saskatchewan		447,090	1,846	37,547		31,104	24,562	168,895	711,045			
Total by Variety	1,579,652	144,350,958	18,243,968	60,283,422	952,940	1,423,971	46,994,866	79,722,343	353,552,120			
_												
Ontario -												
2017 vs. 5 Year Average	-100%	-5%	-10%	-4%	67%	-56%	-15%	-11%	-8%			
Total By Variety -												
2017 vs. 5 Year Average	-100%	-11%	-21%	-7%	23%	-23%	-16%	0%	-9%			

Note: The province denotes the port of entry and may not necessarily reflect the final provincial destination of imported apples.

Source: Statistics Canada

RISK MANAGEMENT

The Risk Management Committee and Board aims to ensure that government cost-shared programs are meeting the needs of the apple farmers. Following is a review of the current programming.

Agri-Insurance - Production Insurance covers production losses and yield reductions caused by insured perils. Depending on the plan, coverage is available on a total-yield, dollar-value, or acreage-loss basis. Producers can choose the type and level of coverage that best meets their needs. The Risk Management Committee's priority is to communicate to government the needs and ensure a production insurance plan that is responsive to the changing needs of the Ontario apple sector.

Apple Crop Insurance, 2012 – 2018 (as of September 21, 2018)

				Grower	
			Total	Share of	Total
		Liability	Premiums*	Premiums	Claims**
Year	Accounts	(\$000's)	(\$000's)	(\$000's)	(\$000's)
2018	136	62,342	9,292	4,811	unknown
2017	134	58,628	8,038	4,211	12,654
2016	142	49,843	8,632	4,516	2,835
2015	140	45,427	7,077	3,432	13,735
2014	143	41,128	7,868	4,112	2,828
2013	144	33,755	7,053	3,675	4,632
2012	140	34,866	3,482	1,528	26,858
5-year average					
(2013 - 2017)	141	45,756	7,734	3,989	7,337

^{*} Total grower and government premiums

AgriStability - AgriStability covers margin declines caused by any combination of production losses, adverse market conditions or increased costs. If a producer's margin falls below 70% of their recent average, AgriStability helps to offset the difference. The following table shows Apple AgriStability Program participation and payments. Reporting is done by sector and can fluctuate year to year, as the annual sector determination is based on program-year reported income. Sector determination (apple, G&O, cattle, etc.) is based on income at or greater than 50% of total reported income in the program year. This means that an "apple" producer could be reported as a grain and oilseed producer (for example) if their apple income is less than 50% of their total reported income in a given year.

^{**}Claims data refers to approved claims only

AgriStability Apple Statistics

(as of August 24, 2018)

Year	Processed	Payments	Total \$	Average
2017	87	19	\$ 869,807	\$ 45,779
2016	159	26	\$ 566,615	\$ 21,793
2015	180	21	\$ 1,300,909	\$ 61,948
2014	193	53	\$ 1,579,291	\$ 29,798
2013	183	30	\$ 1,197,289	\$ 3,910
2012	208	89	\$ 2,343,273	\$ 26,389
2011	212	44	\$ 1,534,914	\$ 34,884

Note: Processing statistics represent files processed as of August 24, 2018. Potential for additional Apple file processing and payments is possible as processing for 2017 continues.

Edible Horticulture Support Program – The Edible Horticulture Support Program provides financial support to help Ontario producers of edible horticulture products adjust to new and challenging cost pressures in the small business environment. Payments are based on net sales of edible horticulture. The Edible Horticulture Support Program is funded by the Government of Ontario and runs for two years, from 2018 to 2019.

Participants will receive a payment in late April based on their allowable net sales of edible horticulture, as reported in your 2016 tax data and already calculated for SDRM: Edible Horticulture. Payments are calculated using tiers based on your Allowable Net Sales (ANS) and a proration rate is applied, based on participation, to ensure total payments do not exceed available funding.

AgriInvest - AgriInvest is an additional business risk management program that producers can use to either cover small income declines or support other investments. Each year, producers can deposit up to 1.0 percent of their ANS into a bank account and receive a matching government contribution. Producers can withdraw funds at any time.

Commodity Loan Program (CLP) & Advance Payments Program (APP) - Apple growers currently have access to two government cash advance programs through Agricultural Credit Corporation. Both programs are available to all apple growers in Ontario.

The **Commodity Loan Program (CLP)** is a provincial government cash advance program that provides up to \$750,000 of available financing at bank prime rate (currently 3.70%). The program begins January of each year, and advances are required to be paid the following year in February. Producers must utilize production insurance to participate.

The **Advance Payments Program (APP)** is a federal government cash advance program that provides up to \$400,000 in available financing to producers with the first \$100,000 interest free and the balance at the bank prime rate. Apple growers can access this program starting April 1st of each year based on anticipated production using either Production Insurance or AgriStability insurance. After October 1st of each year,

security may be based on inventory on hand, without the Production Insurance or AgriStability requirement.

Major improvements have been made for both programs in 2017/18. Five advance/loan rates are now available ranging from 9 cents to 31 cents per pound for the APP program and from 13 cents to 46 cents per pound for the CLP program. These price levels recognize higher priced apple varieties. The new application process can be completed by the producer by simply contacting our office and completing the application over the phone with one of our trained staff. Producers who are interested in applying or have questions regarding either program can contact the ACC office for further information at 1-888-278-8807 or by visiting our website at www.agcreditcorp.ca for details and updates.

PROMOTIONS

The Ontario Apple Growers work in collaboration with Foodland Ontario and the Apple Marketers' Association of Ontario (AMAO) on promotional programs to entice consumers to purchase Ontario apples. The OAG would like to thank the AMAO for their funding contribution towards our 2017/2018 crop year promotions.

FOODLAND ONTARIO ACTIVITIES

Recipe Releases - Ontario Apples were featured in September 2017, October 2017, December 2017, January 2018, February 2018 and March 2018.

Fresh Perspectives Newsletter – Ontario Apples were mentioned 17 times in the 2017 Autumn issue, 15 times in the Winter 2017-18 issue, 8 times in the Spring 2018 issue and 6 times in the Summer 2018 issue.

Television Appearances (September 2017 to June 2018)

- ✓ Print Articles Ontario Apples appeared in 128 print articles with a circulation of 3.3M consumers Editorial value of \$257,048
- ✓ Broadcast Ontario Apples were featured in 59 television appearances, reaching an audience of 647,000
- ✓ Ontario consumers Editorial value of \$805,200.00
- ✓ Total Editorial Value (print and broadcast) \$1,062,248.00

Foodland Ontario Calendar - Over 500,000 English copies and 5,000 French copies of our Foodland Ontario calendars are distributed across the province at grocery retailers, farmers' markets and on-farm markets. Apples were featured in our December 2017 recipe, Caramelized Apple Tiramisu, and our January 2018 recipe, Honey Oat Apple Muffins.

Social Media

Foodland Ontario's posts in relation to Ontario Apples generated the following:

- ✓ Facebook 5.9M Reach, 3.9K Likes, 2K Shares, 274 Comments
- ✓ Twitter 99.8K Impressions, 509 Likes, 399 Retweets
- ✓ Instagram 50K Impressions, 2.8K Likes, 77 Comments
- ✓ Pinterest 217 Re-pins



Fall/Winter 2017/2018 Booklet - Foodland Ontario printed a total of 760,000 fall/winter brochures and Ontario Apples were featured in our Cheesecake Maple Apples recipe.

Toronto Sportsmen's Show - An Apple Whiskey Grilled Rabbit dish was a featured recipe at the Toronto Sportsmen's Show this past year. The recipe reached about 100 consumers, while 500 copies of recipes were handed out.

Radio Advertising - Ontario Apples were featured on radio tags across the province the week of October 9th, 2017 and February 5th, 2018. Consumers were reminded that "fresh Ontario Apples are available in stores, farmers' markets and on-farm markets" in 62 English and 9 French markets.

Retail Display Contest – ran from September 11th, 2017 – November 30th, 2017. Number of entries received were 342 (see photo below).

Point of Sale Material Placement - From August 2017 - August 2018, the Foodland Ontario Merchandising Team placed almost 19,000 pieces of POS and over 4,500 feet of base wrap (that is over twice the height of the CN Tower) on apple displays.



2017/2018 OAG ACTIVITIES Food Influencers

This year we again focused on informing Ontario based food influencers (or 'bloggers') in order to increase awareness of the almost year-round availability and versatility of Ontario apples; encourage consumption of Ontario apples (branded with the Foodland Ontario logo); and educate consumers about the economic impact of the Ontario apple industry.



Activities included:

- ✓ Tour at Lingwood Orchards and Norfolk Fruit Growers' Association storage and packing plant in November 2017.
- √ 16 bloggers joined us to amplify the messaging on social media & incorporate the information into blog posts.
- ✓ Worked exclusively with 6 of these bloggers and 1 Registered Dietitian for our campaign.
- √ 18 new Ontario apple recipes were created by the food bloggers. Each campaign was to include a dessert recipe (December), a snack recipe

	nfluencer Impact
18	Recipes from 6 top Ontario food bloggers & influencers creating original and delicious recipes using Ontario Apples
9,187	Total page views
3	Minutes average time spent on blog posts
3,814	# of times recipes pinned to Pinterest
7,776	Instagram Likes
1,997	Facebook Engagements
69,179	#of Facebook users reached
2.4 million	Twitter Impressions of #OnAppleAday
975K	Twitter User Reach of #OnAppleAday
701K	Instagram Impressions of #OnAppleAday
283K	Instagram User Reach of #OnAppleAday

(January) and a savory meal (March) with an emphasis on "world foods".

Media Tour

Our Dietitian spokesperson, Carol Harrison, secured tv, radio & print placements as part of an integrated #ONappleAday media tour to accompany the blog posts developed by our influencers. Placements included:

- ✓ January 2 CTV news Kitchener reboot snacking choices for 2018 and avoid sabotaging your workouts.
- ✓ March 2 CTV News theme: cook up some fun with the kids this March break!
- ✓ March 6 Northumberland Radio hosted by fellow dietician Adam Hudson. Featured a 25 min talk all about Ontario apples!
- ✓ March 9 The TKO Show (Windsor) things to do on the March break with the kids including some apple inspired recipes.
- ✓ March 14 Rogers Georgina similar content to March 2 CTV News segment.
- ✓ Can Fit Pro online article on re-booting your snacking choices which includes an apple recipe.

Yummy Lunches 101

School Cooking Demos

Recipe development and school visits to encourage kids to learn about cooking and where their food comes from. Ten cooking demonstrations were held in September 2017 School Year and directly reached 466 participants. Students participated in apple variety tastings and picked their favourite apple and discuss the taste, crunch and texture of the different apples. Students helped peel and dice apples and learned how to cook with them in recipes. Apple info went home in school newsletters so parents could learn about Ontario apples too. Resource and recipe development included:

- ✓ Ontario Apples featured in 3 recipes.
- ✓ Nutritional analysis of recipes included.
- ✓ Recipe cards printed of each recipe card and distributed at the cooking demonstrations.

✓ Yummy School Lunches 101 e-Booklet developed to share recipes and commodity information (download available on OAG website).



New Infographics

Created 3 new infographics for use on our social media channels. They are available on the OAG web site. Topics included:

- ✓ Five salty craving rebooted with Ontario apples.
- ✓ Five reasons to enjoy ONappleAday.
- ✓ Four ways to snack ONappleAday (see example at left).

Blog Posts

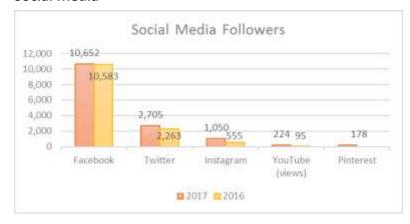
New content developed to be shared on social media and available on our website. Topics included:

- ✓ A is for Apple easy ways to introduce apples to your infant.
- √ 5 apple inspired grab and go post workout snacks.
- ✓ ONAppleAday really does keep the doctor away.
- √ Top 10 apple resources for nutrition professionals.
- √ 5 easy ways to love apples at every meal.
- ✓ 6 mouth-watering apple snack ideas (An FBC blog post which summarized the bloggers snack recipes).

Website

This season we developed and shared our existing and new content on www.onapples.com. From new recipes developed through our school cooking demos, to blogs and infographics, we noted an influx of visitors to the website - 17,640 to be exact – with 76% of these being new users and 24% returning.

Social Media



OAG consistently posted recipes, infographics, blogs, grower stories and apple information relating to varieties grown in Ontario and care & handling instructions throughout the season on all @OntarioApples social pages (Facebook, Instagram, Twitter, Pinterest) incorporated our hashtag #ONappleAday. (See chart on left showing our growth in followers and views since our 2016 campaign).

Produce Made Simple

Ontario Produce Marketing Association's "Produce Made Simple" program and OAG partnered once again to promote Ontario apples on their website and on social media to their over 65,000 followers. Activities included:



- ✓ Featured commodity on website homepage for one week in October.
- ✓ Additional feature in the "Love Local" section of the site.
- ✓ Full page spread in newsletter sent to 683 subscribers.
- ✓ New videos to encourage consumption released in November.
- ✓ Added 18 new apple recipes.
- ✓ Updated banners on social channels as well to reflect that apple season had begun (see photo above).

FBC Conference Ottawa

Another sold out year for the Food Bloggers of Canada conference. With 150 attendees, an apple-inspired breakfast, and many networking opportunities, OAG has established a wonderful relationship with food influencers eager to work with us on future projects. We also ran an Instagram photo contest at the beginning of the season and gave away an extra ticket for the sold-out conference to one lucky winner who shared their favourite apple memory with us.

Royal Agricultural Winter Fair

OAG was one of many commodity groups represented within the OFVGA exhibit space at the RAWF this year, where we handed out apples to passersby. The Farm to Table Discovery Zone had a focus on technology and career opportunities within the fruit and vegetable industry and a portion was dedicated to an Ontario "World Foods" display. For added impact, we were able to loop our "Farm to Table" apple industry video on monitors throughout the exhibit.

Ride for Heart

OAG provided 5,250 apples at the food market so participants could stay well-nourished. This partnership emphasized the importance of healthy living, while raising the fundraising potential for heart disease and stroke research among the Ride for Heart participants.

Run for the Cure

OAG donated 50 cases of apples to this year's Run which raised an estimated \$17 million for the Canadian Cancer Society. Each year this event brings together more than 85,000 Canadians in 56 communities across the country and is the largest, single-day, volunteer-led event dedicated to the breast cancer cause.

GROWER INFORMATION & COMMUNICATIONS

The OAG uses several means to reach our membership. All newsletters are currently distributed by mail with 9 newsletters sent between December 2017 and November 2018. The OAG also distributes OMAFRA's *Orchard Network Newsletter* four times a year. There is a "Grower" section on the web site where newsletters, industry statistics and information are always available. OAG members can log into

this at any time with their grower number. New this year is a Classifieds section on the Grower section of the web site.

Ontario Young Apple Farmers

Since 2014, the Ontario Young Apple Farmers group has been bringing together new and young apple farmers in Ontario as a way for them to network and learn from each other. The group continues to grow with over 60 members. This year the OAG was able to provide 5 free registrations for members of this group to attend the Apple Academy held in January 2018. The group tries to meet at least twice face-to-face each year. In December 2017 they meet and toured Manitree Fruit



Farms in Blenheim and in April 2018 they toured the Norfolk Fruit Growers' Association and Lingwood Farms. The group continues to use the texting app called "What's App" to continue their conversation and learn from each other on a daily basis.

INDUSTRY COMPETITIVENESS Orchard Juice Apples

	С	rchard Juice
Crop Year		Price (/lb.)
2018	\$	0.075
2017	\$	0.060
2016	\$	0.575
2015	\$	0.065
2014	\$	0.055

The OAG negotiates the price of orchard (grounder) juice apples with the juice processor in August of each year. Pricing is determined based on competitive market forces. The 2017 Ontario crop estimate was projected to be down 20% from 2016 with 5.8 million bushels in total yield (fresh and processing). The minimum orchard juice apple price for 2017 was \$.06/lb. FOB farm gate on the first 15 million lbs. and \$0.575/lb. FOB farm gate for volume over 15 million lbs. The minimum orchard juice apple price for 2018 is \$.075lb. FOB farm gate on the first 15 million lbs. and \$0.063/lb. FOB farm gate for volume over 15 million lbs.

Ontario Craft Cider

The Ontario craft cider continues sector expand. Ontario Craft Cider Association (OCCA) elected a new chair of the organization, Richard Liu from Ironwood Cider. Ontario Craft Cider Association members are required to use only 100% Ontario apples for their cider. Communications are ongoing between the OAG and OCCA to ensure up-to-date information comes from both sides. OCCA continues to work on behalf of their members to educate stakeholders and to ensure that Ontario craft cider can be found prominently in LCBO and authorized grocery stores across the province. For more information, including a list of Ontario cideries, visit ontariocraftcider.com. You can also follow them on social media.



Research and Development

The OAG has secured more than \$363,870 in research grant funding while providing \$66,647 in grower seed funding. Each year, the Research Committee meets with research extension staff to review minor use priorities and discuss research project results and proposals. Our research priorities are as follows:

Technology, Mechanization, Automation & Efficiencies

Increased production efficiencies through the use of the latest technologies and precision agriculture. Priorities (not ranked) include, but are not limited to:

- Labour efficiencies
- Pest management and crop protection efficiencies
- Weather risk efficiencies
- Water use efficiencies
- Modelling
- Remote sensing, software development and robotics
- Orchard design

Sustainable Practices

Sustainable cropping practices (crop load management, training systems, carbon capture, irrigation, fertigation, soil management, nutrition) are optimized according to variety and agro-climatic conditions. Priorities (not ranked) include, but are not limited to:

- Production efficiencies
- Integrated Fruit Production (IFP)
- Lower environmental impact
- Area wide practices
- Organic

Variety & Rootstock Development and Evaluation

New varieties and rootstocks are developed and selected according to consumer preferences and their performance in the different regions with the goal of achieving greater market share. Priorities (not ranked) include, but are not limited to:

- New variety breeding and evaluation
- Scion and Rootstock evaluation (i.e. winter hardiness, drought efficiency)
- Genomics
- Consumer preference studies

Maximizing Quality & Minimizing Losses

Focus on crop maturity management and post-harvest storage conditions and treatment strategies with the goal of delivering a larger percentage of high-quality fruit for the fresh market. Priorities (not ranked) include, but are not limited to:

- Post-harvest research (for example, storage disorders and diseases)
- Optimal harvest management and timing

The following is a synopsis of the many research projects that the Ontario Apple Growers has either managed or provided support (financially or in-kind).

Optimizing Production and Quality of Ambrosia, Honeycrisp Apples through Advanced Thinning and Mitigating Biennial Bearing Strategies – Dr. John A. Cline and John Zandstra (University of Guelph)

A three-year project was initiated in 2017 to develop new strategies to thin Ambrosia and Honeycrisp apples with the use of Carbaryl (Sevin XLR™). In addition, the physiology of biennial bearing will be investigated on Honeycrisp. The specific objectives of this project are to: 1) investigate the thinning efficacy of ACC and metamitron (if available) in comparison with 6-BA and Carbaryl on Gala and Ambrosia; 2) determine the effectives of the flower inhibitor GA4+7 in adjusting the crop load on Gala and Honeycrisp; 3) determine the effectiveness of dormant "precision" pruning in combination with NAA on Gala and Honeycrisp; 4) measure the biennial bearing of Honeycrisp trees in comparison with Gala, and; 5) measure flower bud induction and initiation and organogensis in Honeycrisp and Gala.

Performance of Honeycrisp on 15 size-control rootstocks – Dr. John A. Cline and John Zandstra (University of Guelph)

A ten-year project was initiated in 2014 to determine the horticultural attributes of several new Vineland and Cornell-Geneva size controlling rootstocks with Honeycrisp and Aztec Fuji as the scion cultivars.

Ten trees each of Honeycrisp and Aztec Fuji on 17 different rootstock were planted in 2014 as part of the Canadian Horticultural Council's GF2 Science Cluster project at Simcoe and Cedar Springs Research Stations. Trees are trained to a spindle type training system and trickle irrigated. Trees are being monitored annually for trunk circumference growth, tree height and spread, yield, fruit size, rootstock suckering and longevity.

Honeycrisp is a weak growing cultivar that has suboptimal production on M.9 or other dwarfing rootstocks. Increasing tree vigor through the use of a semi-dwarfing rootstock in the size range of M.26 and M.7 may prove to be beneficial for overall productivity, tree performance, and longevity. This project is being funded for five years by the OAG (through the Canadian Horticulture Council), and is also part of a wider North American NC-140 Project.

Fire Blight Risk during 2018 Bloom - Michael Celetti, OMAFRA Plant Pathologist - Horticulture Crop and Michelle Reid, OMAFRA Summers Student

Fire blight is a very devastating bacteria disease of apple and pears. The models available (Maryblyte and Cougar Blight) were intended to be site specific, however, many apple growers have indicated time constraint challenges in collecting and entering environmental data daily into the models to determine fire blight infection risk during bloom. The 7-day weather forecast data from 72 sites, representing most counties in southern and eastern Ontario where apples are grown, was put into the Cougar Blight model and updated 3 times per week during apple blossom time May 4 - June 6, 2018. Risk were developed into animated maps based on the fire blight situation of the orchard that were posted on the OMAFRA website and the link was emailed to OAG members. A recap of the year can be found on the OMAFRA website at http://www.omafra.gov.on.ca/english/crops/facts/fireblight-2apples.htm. The OAG would like to thank Michael Celetti for his commitment and work to provide this information to Ontario apple farmers.

Canadian Tree Fruit Products Development – Erin Wallich, Summerland Varieties Corporation, Kelly Ciceran, Larissa Osborne, Leslie Huffman, OAG and Amanda Green, OMAFRA

The Grower Testing project is led by the British Columbia Fruit Growers' Association (BCFGA) in partnership with Ontario Apple Growers (OAG), Summerland Varieties Corp. (SVC), Scotian Gold and the Québec-based consortium, Le réseau d'essai de cultivars et de porte-greffes de pommiers (RECUPOM). The partners work with the apple breeding staff at Agriculture and Agri-Food Canada's Summerland Research and Development Centre (Summerland RDC) in Summerland, BC to test promising new apple selections under a range of growing conditions. The project has just been awarded funding through the Agri-Science Program and will continue for another 5 years with funding from the federal government and all the partners, including those mentioned above plus Vineland Research and Innovation Centre (Vineland).

For more than 7 years, 11 grower-cooperators across the province planted advanced selections of apple breeder's selections to evaluate for suitability for various climatic regions and markets in Ontario. Each grower was provided with the trees and asked to plant a supported system and to provide their observations. All growers can harvest and use the fruit, unless sampling is needed for the OAG's evaluations. Below is a chart of the plantings since 2012:

Year	Sites	Selections
2012	11	7 (all AAFC/SVC)
2015	11	5 (4 AAFC/SVC + Evangeline AAFC/NB)
2016	10 (2 new, 3 declined)	4 (3 AAFC/SVC + 1 from U Minnesota)
2018	2 larger plots	4 best from 2012-2015
	7 (to date)	7 new (2 from VRIC, 4 from AAFC/SVC, 1 from AAFC Ontario test plots (2000))

The OAG Cultivar Committee had developed this list of desirable traits:

- Large fruit size nothing smaller than Empire
- Good fruit quality firm and juicy
- Fire blight not more susceptible than Gala
- Scab not more susceptible than McIntosh

- Trees suitable to high density systems
- Harvest season outside of Gala/Honeycrisp time
- Yellow fruit is of special interest
- Unique varieties for direct marketing is of interest

Update on Varietal Testing at Vineland Research and Innovation Centre – Dr. Daryl Somers, Vineland Research and Innovation Centre

Beginning in the spring of 2011, the breeding program has now completed its 8th season! The initial Test 1 orchard block consisted of 1,650 seedlings which has been culled to 130 trees based on taste profile. These 130 trees are currently being tasted in 2018 for a second season and will be culled after that. A total of 25 selections have been advanced to the Test 2 orchard and a few more are expected to be advanced following this season. We experimented with accelerating tree production by budding 3 selections that were being advanced to Test 2 in Feb 2017 in the greenhouse. In spring of 2018 (16 months later), these trees flowered on the farm and produced ample fruit. This will be our process going forward.

We are currently examining a Test 1 orchard block budded in 2014 and consisting of 2,100 seedlings, plus we will have ~300 Test 1 orchard trees budded in 2015 to be evaluated for taste profile. We are working with the Vineland sensory lab to assist with our annual selections and anticipate advancing ~20 selections again this year to build the Test 2 orchard fast with high quality apples.

Rapid Virus Indexing of Fruit Trees – Travis Banks, Vineland Research and Innovation Centre

The goal of this research project is to validate new Canadian Food Inspection Agency (CFIA) technology to reduce the time needed to certify tree fruit material as being free of harmful viral infection. We hope that this research will lead to affecting policy within CFIA to use the technology to 1) allow the rapid introduction of new fruit tree varieties into Canada by reducing time in quarantine at Sidney, BC and 2) give industry a definitive single-test for their own Gen 1/1A and 2 materials.

This project collects bark and leaf tissue from approximately 200 different trees over 2 years. The trees are a mixture of material from CFIA clean-stock at Sidney and samples known to be carrying various viral pathogens. In the first two years of the project, Vineland and CFIA will test duplicate samples of the same material and the results compared to gauge reproducibility of the new CFIA technology. In the third year of the project, testing of the 200 replicate samples with be completed and experiments will be performed aimed at reducing the costs of the technique for industry to monitor their own material.

Vineland is the lead on this CAAP funded project which was approved in February 2017 (10 months later than expected). CFIA is preparing to send us the last batch of leaf samples which will be processed before the end of the calendar year. Data analysis has been completed on 75% of the samples and we've sent those results to CFIA to compare against their own findings. Experiments to evaluate cost-reduction techniques for the method have begun. We are projected to complete this project by the schedule date of March 31, 2019. The OAG would like to recognize and thank the Georgian Bay Fruit Growers' Association for their funding contribution towards this project.

Canadian Agri-Science Cluster for Horticulture 2

The following industry-driven issues, which were common throughout the collaborating provinces, are being investigated with funding from the Canadian Agri-Science Cluster for Horticulture 2 with total funding of \$1.5 million over 5 years (2013 to 2018). These projects were generously funded through the Canadian Agri-Science Cluster for Horticulture 2, in partnership with Agriculture and Agri-Food Canada's AgriInnovation Program, a Growing Forward 2 initiative, the Canadian Horticultural Council and industry

contributors. The OAG would also like to recognize and thank the Apple Marketer's Association of Ontario (AMAO) for their funding contribution towards this project.

Multiple Storage Technologies to Improve Efficiency, Reduce Energy Consumption, and Extend the Availability of Canadian Apples (DeEII, OMAFRA)

This project generated new knowledge for the Canadian apple industry, pertaining to major postharvest storage issues. Advanced knowledge included:

- 1) Methods to control CO₂ injury in apples during storage without using diphenylamine (DPA),
- 2) Data on typical DPA residues throughout storage facilities,
- 3) Optimized storage regimes for 'Honeycrisp' and 'Gala' apples, and
- 4) Effects of fruit cooling rate on apple quality after storage.

By better understanding the effects of various technologies and using optimized storage regimes, the Canadian apple industry should improve packinghouse and storage efficiency, reduce energy consumption, decrease product loos, and extend the availability of Canadian apples for domestic and export markets.

For example, at the start of this project, controlled atmosphere (CA) storage was not recommended for 'Honeycrisp' apples in Ontario, Quebec, etc. The project evaluated various storage practices throughout the years and developed a method for successful CA storage of 'Honeycrisp'. The best procedures allowed for ~ 6-7 months of storage. There is tremendous interest among the Canadian apple industries to adopt these best practices for successful storage of 'Honeycrisp' apples, as well as to continue with further investigation into methods for longer term storage.

Another example is the practice of delaying CA establishment for the storage of 'Empire' apples to reduce the development of CO² injury. This project found that delaying CA for 1-2 months substantially reduced storage disorders and thus reduced the necessity of DPA for 'Empire'. Consequently, a few commercial apple storages have already moved towards adopting this practice for 'Empire' apples. It is important to note that this project also found that delaying CA is not a successful practice for 'McIntosh' apples, as there is substantial fruit quality loss and disorder incidence is high. Therefore, cultivar variation in response to storage conditions continues to be an important factor and each cultivar must be studied separately.

Performance of Honeycrisp on New Size-Controlling Rootstocks (Cline, University of Guelph)

Through this study, important data has been compiled and analyzed in order to assist with the decision-making about the suitability of new rootstocks for Honeycrisp. Factors such as tree growth and survival as well as fruit production and quality, for which data has been collected, must all be taken into consideration when making recommendations. The range in tree vigour afforded by the various rootstocks provides growers with several planting options based on soil type and fertility, desired rootstock vigour, and orchard system. There is interest in more vigorous rootstocks where tree growth is limiting due to climate, soil, or replant disease. The Vineland series and B.10 look particular promising in this regard. When a more dwarfing rootstock is desired, G.969 looks both productive, size-controlling, and very comparable to M.9 T337.

New biological control products for postharvest diseases of pome fruit (Nelson, University of British Columbia)

At least one of the *Pseudomonas fluorescens* isolates (isolate 4-6) showed efficacy in both British Columbia and Ontario and isolate 1-112 was also effective under some conditions in British Columbia in controlling postharvest fungal pathogens of apple and these isolates were comparable to the only commercial biological control product for postharvest pathogens registered in Canada. Information on potential modes of action of the isolates was also collected as part of this project. These isolates may have commercial potential and while we now have accumulated a substantial data set that would assist with registration, more research and development would be required with an industry partner prior to commercialization. Initial consultation with PMRA suggested that a value-only assessment would be the logical next step. Data requirements for the chemistry assessment, human health and environmental risk assessments for product registration would need to be determined and then collected. Formulation, including adjuvants and carriers would also require development prior to registration.

Development of a consumer-driven sensory quality process for Ontario bred apples – Dr. Amy Bowen, Dr. Alexandra Grygorczyk and Dr. David Liscombe, Vineland Research and Innovation Centre and Dr. Lisa Duizer, University of Guelph and Amanda Green, OMAFRA

This project will identify consumer liking drivers amongst the most popular apple varieties identified through current consumer trends over the next three years. This information will be converted into an apple quality screening process that links consumer preference to apples in the orchard.

The objectives of this project are to:

- 1. Identify consumer preference drivers among top apple varieties; and segment consumers based on preference and demographics;
- 2. Develop a process for screening the flavour and texture quality of apples created by Vineland's apple breeding researchers;
- 3. Correlate consumer preference drivers to allow the selection of the highest quality apples for commercial release.

Year 1 (2017-18) focused on addressing the first objective of the project. Twenty-eight commercial apple varieties were selected and profiled by Vineland's trained sensory panel for 18 sensory attributes (aroma, flavour, texture, taste). In parallel, sugars, acids, maturity and aroma compounds were measured to correlate with sensory perception. The apples were classified into four groups based on their flavour profile.

- Sensory group 1 had eight varieties including Honeycrisp and described by sweet, honey and floral characteristic with low perceived bitterness, astringency and acidity.
- Sensory group 2 had nine varieties including Gala and had a balanced sensory profile.
- Sensory group 3 had five varieties including McIntosh and described by higher perceived skin thickness and mealiness with lower perception of crisp and juicy.
- Sensory group 4 had six varieties including Granny Smith and described by high acidity, lemony and astringency with lower perceived sweetness.

Next, a subset of apples varieties that represented the sensory diversity were evaluated by 228 consumers from the Greater Toronto Area for liking. Consumers were pre-screened for qualification to ensure they were apple consumers and primary grocery shoppers between the ages for 18-60. Consumers tasted each

of the 15 apple varieties and rated their liking on a scale out of 100. Then they completed an end questionnaire about their attitudes and purchase habits of apples. Consumer were grouped by liking scores and three consumer groups were identified.

- Consumer group 1 (29%): Prefer apples that have crisp and juicy textures with sweet, honey and floral characteristics. These consumers were more likely to be born in Canada, have no children at home and purchased apples for themselves.
- Consumer group 2 (49%): Prefer apples that are sweet with honey and floral characteristics. Texture is not as important to these consumers. These consumers were more likely to not be born in Canada, be of Chinese descent, have 1 child at home, and purchase apples for everyone in the household equally.
- Consumer group 3 (22%): Preference drivers could not be determined. This group had low liking scores for all varieties. These consumers were more likely to be born in Canada, and have 2 or more children at home.

When asked to select apples based on visual appearance, consumers tended to choses apples that were familiar such as Granny Smith and Gala. The top reasons given for selecting an apple by visual appearance included healthy, red, vibrant, and familiar.

Year 2 (2018-2019) of the project will focus on the development of methods to measure differences in apple texture to correlate with sensory perception and the investigation of the aroma compounds that correlated to consumer liking drivers.

This project is funded by the OMAFRA-University of Guelph Partnership Program, Products and Value-Chains theme with support from the Ontario Apple Growers.

All About Apples: Obesity-related health benefits and communication strategies to increase apple knowledge, purchase and consumption in Ontario – Dr. Lindsay Robinson, University of Guelph

The Apple Study human clinical trial began in October 2017 and has been continuing steadily and productively throughout the past year. Importantly, an apple delivery schedule with our partners (Martin's Family Fruit Farm, Norfolk Fruit Growers' Association) was established and has worked very well over the past year. The Apple Study has two phases: an acute phase wherein participants are monitored for 6 hours after consuming 3 (100 g) apples and a high fat meal in one sitting; and a chronic phase wherein participants consume 3 apples/day for 6 weeks. Eligible participants may choose to take part in one or both phases of the study. The acute phase of the study was completed (with 26 participants total) in September 2018 and analysis of various metabolic and inflammatory outcome measures is underway. More details on the clinical trials, analyses, and other aspects of the Apple Study are below.

Update on the Apple Study human clinical trials

Our most significant accomplishments over the past year have been our productive recruitment and screening of participants for entry into the acute and/or chronic phase of the Apple Study, completing the acute phase of the study, as well as the ongoing study visits at the Human Nutraceutical Research Unit at the University of Guelph.

Update on the Apple Study data analysis

Since completion of the acute phase of the Apple Study in September 2018, we have made progress in analysis of our key outcome measures in blood samples collected from the study participants, including lipids, glucose, insulin and a measure of gastric (stomach) emptying after the acute apple intervention. While much of the hands-on laboratory work has been completed, the data and statistical analyses now need to be completed for these outcome measures before we can report on the effect of the apple intervention. Also, in the coming months, we will analyze all blood samples and isolated immune cells for inflammatory biomarkers and immune mediators. Lastly, fecal samples have been collected from participants in the chronic phase of the study (i.e. pre- and post-6-week apple intervention) for analysis of bacterial species, short-chain fatty acids, and anti-oxidant capacity. This analysis will be completed between January-March 2019 (in collaboration with Dr. K. Power, formerly at AAFC, now at University of Ottawa). Finally, comprehensive nutrient analysis of Ontario Gala apples used in the study will be completed in Fall 2018.

Update on the dissemination of Apple Study information and results

Although we do not yet have finalized results from the Apple Study, we have been actively participating in various types of knowledge dissemination, providing information about the project at various venues e.g. University of Guelph College Royal, Arrell Food Summit, Annual Food Structure and Functionality Forum Symposium, Natural Health Product Research Society of Canada Annual Conference, Canadian Nutrition Society Annual Conference, and on campus seminars/conferences. In the past year we have given four presentations at local or national level conferences, which have provided valuable opportunities to showcase the Apple Study to intended target audiences, e.g. consumers, agri-food experts, nutritionists, researchers, etc. We plan to continue similar knowledge translation activities to enable wide dissemination of new information about apples and health as our results become available in the coming months.

Update on the Apple Study consumer survey

Project team members are continuing to advance our goal of providing effective strategies for a sustainable increase in apple purchase through studying barriers and motivators towards apple purchase and consumption. As of mid-October 2018, we are near a final draft of the consumer survey with ongoing input from our collaborator Dr. Sunghwan Yi (University of Guelph) and the Ontario Apple Growers. We have received approval from our Research Ethics Board to conduct Cognitive Interviews with our current and past Apple Study participants, during which participants will think aloud as they complete the survey to help us best word and organize the survey such that respondents will properly interpret the questions. Once the survey is finalized, we will apply for approval from our Research Ethics Board to administer the survey to ~800 adults across Ontario (balanced by age, sex, region and education) via a Data Services Firm, but pending their final quote based on our final survey length and complexity. This important and exciting aspect of the Apple Study will be a significant focus for the remainder of 2018 and into 2019.

Update on training/education of students involved in the Apple Study

The Apple Study has provided the opportunity to train and educate a significant number of students at the University of Guelph. Since the project start, 12 graduate (PhD or MSc) and 6 undergraduate students have been/are actively engaged in different areas of the Apple Study and are gaining knowledge/experience of apples, research and knowledge translation. In particular, two PhD students, Danyelle Liddle and Xinjie (Lois) Lin are the student leaders of the Apple Study on a daily basis and have been instrumental in the progress to date on our OMAFRA/OAG-funded Apple Study.

Growing Forward 2 Organic Science Cluster Projects

These two projects were generously funded through the Canadian Organic Science Cluster, in partnership with Agriculture and Agri-Food Canada's Agrilnnovation Program, a Growing Forward 2 initiative and industry contributors. Both projects ran until March 31, 2018.

Development of organic control strategies for apple scab - Dr. Deena Errampalli, AAFC

This four-year project had two main objectives. Final results are outlined below.

Objective 1 - To test or evaluate full season organic spray programs consisting of Sulphur, liquid lime sulphur alone or in combination with the following:

- a. Bacillus sp. Trichoderma or other biocontrol agents (endophytes)
- b. Methyl jasmonate, chitosan (Elexa) or other plant resistance activators
- c. Evaluation of full season spray program field trials
- d. Management of leaf debris: with biological sprays and shredding of debris

1a. Isolation and identification of endophytic fungi suppressing conidial production by the apple scab pathogen Venturia inaequalis.

During the 2017-18, a total of 55 bacterial and 60 fungal endophytes were characterized for apple scab control in vitro. These were selected from 155 isolates collected in 2015 from crabapple, non-cultivated apple and conventional apple orchard in Ontario were identified by DNA sequencing. All these microorganisms were characterized visually. The select isolates showed inhibition of three isolates of apple scab pathogen on culture media. Further characterization of these endophytic microorganisms for apple scab suppression on apple seedlings of McIntosh cultivar was not successful. Further characterization of these endophytic microorganisms for apple scab suppression on apple seedlings on McIntosh was carried out in 2017-18.

1c. The goal is to identify most effective spray program, which include select endophytes and plant defense activators from sub-objectives 1a and 1b in combination or alternation with the commercially available sulfur products, to reduce chemical inputs in the orchard.

The effect of organic fungicides against V. inaequalis to reduce development of apple scab in 'McIntosh' and 'Empire' apples in the orchard was determined. The trials were conducted in 2016-17 and 2017-18. Due to lack of apple scab the results could not be recorded in 2016. In 2017, the apple trees were sprayed with organic fungicides, a water control and a chemical control (N-trichloromet hylthio-4-cyclo hexene-1,2-dicarboximide, Captan). The organic fungicides used were 80% Sulphur (Kumulus) and 0.25% Reynoutria sachalinensis and 0.25% pre-bloom and 0.75% post bloom R. sachalinensis (Regalia #2), Cueva + Double Nickle, Badge X, Microthiol – Disperse and Control (water). Foliar rating scale was used to take weekly observations of the presence of apple scab on McIntosh and Empire leaves. Disease ratings on fruits were taken a total of three times. Foliar rating scale was used to take weekly observations of the presence of apple scab on McIntosh leaves. Disease ratings on fruits were taken a total of three times. Experiments were conducted at AAFC research centre in Vineland, ON. As expected the chemical positive control gave good scab control at all observation points. Kumulus was effective after 4 sprays unto the

end of June. Badge was significantly different up to Aug 8. Similar results were also observed in both 'McIntosh' apples and 'Empire' apples. This trial needs to be repeated.

Three treatments were tested including the Captan, Reynoutria sachalinensis and water control was applied to apples in a 10-acre plot at an industry collaborator's orchard in Quebec. The treatment, Regalia had higher apple scab as compared to the chemical treatment Captan. There was no significant difference between the control and treatment with regards to weight or circumference of apples.

Objective 2 - Project evaluation using the data from the objectives above, generate economic analysis of organic spray programs and improve recommendations for the control of apple scab in organic apple orchards. In 2016 due to dry conditions natural apple scab did not develop in the orchards and as a result no data was obtained in 10-acre field trials in commercial orchards. The conditions were good for apple scab development in the spring of 2017 in Ontario and Quebec. The apple scab disease developed on apple trees or fruits in the orchard and the treatments were evaluated properly. However, two-year data from the commercial orchard is required to conduct economic analysis therefore this objective could not be completed.

Integrated organic practices in apple orchard management - Dr. Julia Reekie, AAFC

This four-year project aimed to integrate management practices in apple orchards to meet the challenge of providing adequate tree nutrition for tree health and implement effective pest control to maintain marketable apple production.

Three specific practices relevant to our region were studied: selecting cover crops suitable for the Maritime climate as an alternate source of nutrients, testing a new pollinator-friendly botanical extract, *Quassia amara*, to control the European apple sawfly, and using new application methods to control apple scab and black rot. Various combinations of perennial legumes and grasses consisting of red clover, alsike clover, timothy and alfalfa grown as cover crops in a modified Swiss Sandwich System can be a sustainable way to generate a portion of nutrition for organic orchards.

Our trials showed that these cover crops did not compete with apple trees and they have increased iron contents in leaf which could have helped produce more chlorophyll leading to an observable and measurable greenness in trees. The most beneficial contribution of cover crops was the increase in soil available nitrogen and a consistent increase in potassium input to the soil.

With the emergence of the European apple sawfly (EAS) in our region, organic growers are faced with severe crop loss due to a lack of registered organic pesticides to control this pest. We tested the efficacy of a Quassia extract against EAS with a focus finding the lowest effective concentration to apply. Our results showed that Quassia is effective against EAS and depending on pest pressure, a dose as low as 3 g/ha quassin can provide complete control. Our results can contribute to the eventual registration of Quassia to control EAS.

Apple scab (*Venturia inaequalis*) and frogeye leaf spot or black rot (*Botryosphaeria obtuse*) are two important fungal diseases of apples that affect both foliage and fruit, resulting in substantial economic losses to growers. In a multi-year study (2014-2016), salicylic acid and Actigard® were applied to field-established 'Honeycrisp' as either trunk injections or foliar sprays and 'Cortland' (injection only) trees at the tight cluster stage of flower bud development and at late pink bloom. Incidence of leaf infections was

assessed 1, 2, and 3 weeks after the second treatment while disease incidence on fruit was assessed at harvest. For injection treatments, leaves and fruit on the branch directly above the injection site was assessed. In 2014, both salicylic acid and Actigard® treatments showed less leaf infections of apple scab and frogeye on 'Honeycrisp', but only salicylic acid reduced incidences of apple scab and black rot on 'Honeycrisp' fruit. In 2015, trunk injections of both salicylic acid and Actigard® reduced incidences of frogeye or black rot on 'Cortland' foliage and fruit. In 2016, salicylic acid and Actigard® treatments reduced incidences of apple scab and frogeye on foliage of both cultivars, but there were no significant treatment effects on scab or black rot infections on harvested fruit. Quantitative proteomic investigations employing LC-MS analysis of leaf samples from 2014 and 2015 showed that both salicylic acid and Actigard® treatments resulted in changes in several proteins involved in many metabolic and regulatory pathways.

In conclusion, foliar sprays of these products may be easy to apply as compared to trunk injections. Even though two early applications can provide some reduction in primary infections, protection of secondary infections will be required.

Other Research and Services

CropTracker.com – The web-based system 'CropTracker.com' is available to Ontario Apple Growers members as an online system providing a comprehensive tool for growers. Developed especially for the fruit and vegetable industry, the Canadian-made crop management software platform is used by growers, associations, and cooperators of all sizes. The platform schedules and tracks chemical usage, monitors employees and harvest on site, cuts operational costs associated with creating GAP reports and auditing, enhances traceability, and provides data so operators can make more informed decisions.

This year saw CropTracker receiving two grants to support new innovative product development. The first, funded by Bio-enterprise Corporation and Innovation Guelph, will support the development of an offline mode for growers without or with limited digital coverage. The second, provided by the Canadian government, will support the development of a Harvest Quality Vision system which allow growers to instantly identify discrepancies in bins of fruit before they are packed. Both features are expected to launch in early 2019.

The OAG Storage Lab – The OAG Storage Lab is located at Norfolk Fruit Growers' Association in Simcoe, Ontario and continues to pay benefits for the Canadian apple industry. When first established, the storage lab was supported by the Apple Working Group members of Canadian Horticultural Council with cost-shared funding from the CanAdvance Program. The Lab continues to be fully utilized again this year. The industry very much appreciates the cooperation of the Norfolk Fruit Growers' Association and Dr. Jennifer DeEll, OMAFRA Post-Harvest Lead.

Acknowledgements

The Ontario Apple Growers acknowledges and thanks the support of our many funding partners. In the above research report we have acknowledged the partners for each of the projects. *Growing Forward 2* is a federal-provincial-territorial initiative. The Agricultural Adaptation Council assists in the delivery of GF2 in Ontario.









NATIONAL REPORTS CANADAGAP REPORT



CanadaGAP® is a food safety program for companies that produce, pack, repack, store, wholesale and broker fresh fruits and vegetables. 2018 marks the ten-year anniversary of the availability of CanadaGAP certification. The program is designed to help implement effective food safety procedures within fresh produce operations. CanadaGAP has been benchmarked and officially recognized by the Global Food Safety Initiative (GFSI). Audit and certification services for the program are delivered by third party, accredited Certification Bodies. Over 3,000 produce companies in Canada and the USA are participating in CanadaGAP. Apple farmers, packers and wholesalers across Canada have been active participants since 2009. In Ontario, approximately 100 apple growers and packers are CanadaGAP-certified. While overall program enrolment has stabilized in the last couple of years, some regions and commodity sectors continue to see increased participation (e.g., BC blueberry growers).

2018 proved a busy year with the required re-benchmarking of CanadaGAP to updated GFSI (Global Food Safety Initiative) requirements. GFSI recognition enables program users to access markets both within and outside Canada, and significant effort and resources are devoted to securing and maintaining this recognition. Although considered a small program within the international context, CanadaGAP is one of only nine globally recognized programs, and only one of four in the primary production sector. See www.mygfsi.com for more information.

CanadaGAP has also worked hard over the past year to ensure alignment with the new Safe Food for Canadians Regulations, which come into force on January 15, 2019. In addition to providing technical comments that led to improvements in the legislation, CanadaGAP participated in a voluntary assessment led by CFIA to compare CanadaGAP program requirements with the new federal food safety regulations. The positive results, as well as further details about how CanadaGAP fits with regulatory initiatives in Canada and the U.S., available on the CanadaGAP website are at https://www.canadagap.ca/publications/presentations/

For the first time, the CanadaGAP Food Safety Manuals will not be updated for 2019. The version of the manuals currently in effect (v7.1) will remain in place through next season, with the exception of any required corrections arising from unforeseen, critical changes in food safety science or regulation.

CANADIAN HORTICULTURAL COUNCIL (CHC)

2018 has been extremely busy with government consultations and the USMCA (previous NAFTA)



negotiations. CHC staff are well aware that the onslaught of these consultations has no doubt taken you a lot of time to answer, and we greatly appreciate the feedback that you have provided us, as that helps us to relay your needs and concerns to the government.

CHC has welcomed Robyn McKee as the new Manager, Policy Research and Development and Bev Appleby as the new Administrative Assistant.

A sampling of 2018 Activities and Initiatives at CHC include:

- 14 submissions to government consultation requests including topics such as (but not limited to) carbon pricing, migrant worker support, regulatory modernization, regulatory cooperation with the United States, and others.
- 5 trade-specific consultations.
- CHC staff/Board visits to members and farm tours from PEI to British Columbia and many stops in between; stops included Kelowna, Summerside, Winnipeg, Leamington, Quebec City, Summerland, La Malbaie, Moncton and St. Catharines.
- 3 appearances at Parliamentary and Senate Committees on climate change issues, competitiveness for agriculture in the global market, and pre-budget consultations.
- In November, co-hosting with the Canadian Produce Marketing Association the Fall Harvest: Meetings on the Hill.
- Production of labour awareness videos and preparation for soft launch of campaign in November.

CHC Apple Working Group Update

The CHC Mid-Summer Apple Meeting was held in July in Summerland, BC. The event was hosted by the BC Fruit Growers Association. The industry meeting and orchard tour were well attended by apple growers and industry representatives from across the country.

The working session included discussions on:

- market situations and trends,
- the Canadian Agri-Science Cluster for Horticulture 3,
- Growing the tree fruit sector in Canada: the national tree fruit investment program,
- Ministerial Exemptions,
- Crop Protection, and
- The National Apple Breeding Consortium.

For more information on CHC activities or to obtain a copy of the Annual Report, please visit their website: www.hortcouncil.ca.

NOTES



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Ontario Fruit & Vegetable Growers' Association - Charles Stevens
Ontario Federation of Agriculture - Joe Van de Gevel
FARMS - Steve Versteegh (Shane Ardiel – Alternate)
Horticultural Crops Ontario & Ontario Fruit and Vegetable Convention - Kelly Ciceran
Ontario Agricultural Commodity Council – Greg Ardiel (Kelly Ciceran – Alternate)
Presidents' Council - Charles Stevens