Overview of Bob Bors Sabbatical
July 1, 2008 to June 30, 2009

New Germplasm

Almost 1000 wild haskap plants and 100 seedling lines were obtained during my sabbatical. Most of this germplasm was gathered from across Canada with important seedling lines obtained during my visits to Hokkaido and Oregon (Table 1). Seeds were also sent to me from Russia, China, and Mongolia during my sabbatical. Haskap was collected from 200 sites but perhaps 600 locations were investigated which did not have any. Particularly frustrating was that no *Lonicera caerulea* was found in either BC nor the Northwest Territories despite spending about a week in each location. In these later two areas plants and seeds of other fruit species were obtained. Also, there was not enough time to visit Newfoundland and only a small portion of Labrador was investigated. However, far more germplasm was obtained than I thought possible. Perhaps if I had been less observant I would not have found so much material and had more time available to go farther east.

Table 1. Summary of new haskap germplasm obtained in 2007 and 2008. *Each location was at least 30km apart. *Germplasm from China, Russia and Mongolia was sent to us, but all other germplasm was directly gathered by myself.*

Year	Location	Sites	Seeds	Clones
2008	AB	6	----	30
	SK	35	----	175
	ON	46	15	230
	QC	11	4	55
	NL	5	3	25
	Japan	12	16	----
	China*	1	1	----
	Russia*	1	16	6
	Mongolia*	1	1	----
2009	ON	15	----	122
	QC	16	----	76
	NS	25	13	137
	NB	20	3	98
	PEI	5	----	32
	Oregon	1	30	----
	Wild	200	43	980
	Cultivars		59	6
	Total	200	102	986

In Japan, gathering Haskap was done by Dr. Bors in cooperation with Dr. Ukai and Dr. Suzuki of the University of Hokkaido and at least a dozen others assisted in the tours that were given. Seeds obtained during the Japan trip were shared with Dr. Suzuki for their breeding program. Dr. Kristine Naess played a key role in finding Haskap in Eastern Quebec and Labrador as she had already known several locations where the plants could be found, and she accompanied Dr. Bors on all searches in those areas in 2008.

During my Sabbatical I successfully obtained a 'PTP II Grant' and was able to bring Dr. Artem Sorokin of the Vavilov Institute (the world's largest genebank in Russia) to Canada for a month. He accompanied me on a plant gathering expedition through western Ontario and visited various fruit breeders and the Canadian Clonal Genebank in Southern Ontario. When he returned to Russia he sent us additional germplasm from the Vavilov Institute.

In Oregon I visited Dr. Maxine Thompson where I assisted in setting up bird netting and took notes on early ripening Haskap in her breeding program. Also, Dr. Thompson allowed me to gathered seeds from plants that I deemed superior for use in the U of SK breeding program.

Other grants and plant royalties funded the above mentioned expeditions, but this grant funded the care of the new germplasm once it arrived at the University of Saskatchewan.
The accessions from 2007 have been planted in the field but 2008 accessions are currently in pots and plug trays and will be field planted in 2009.

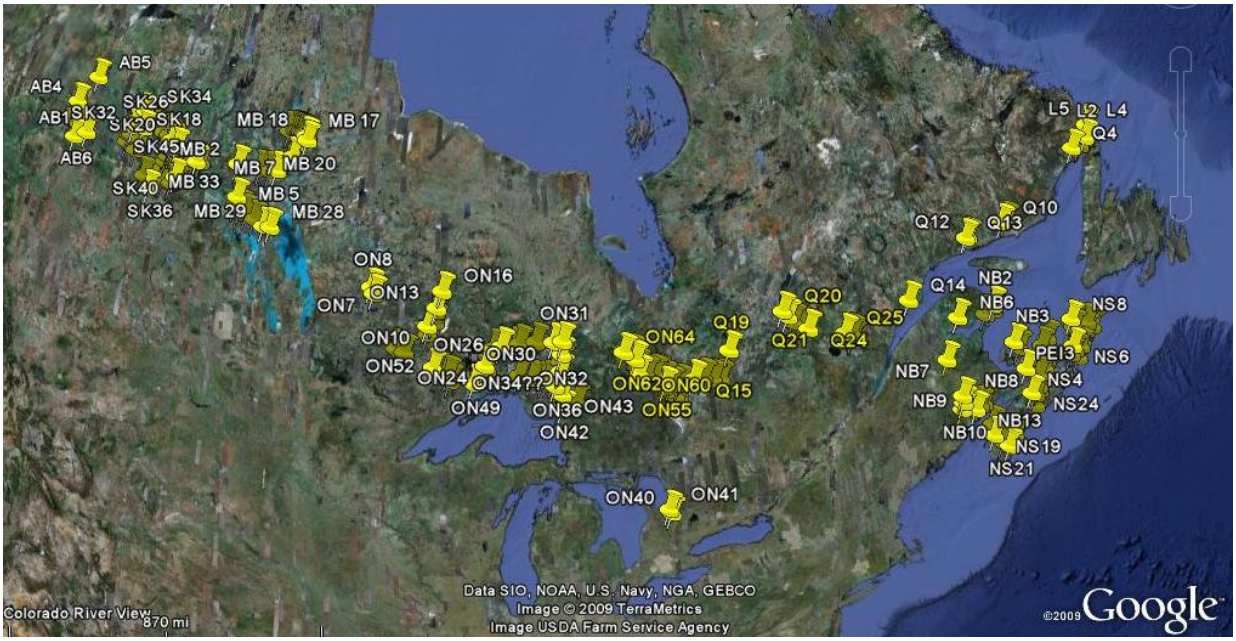

Figure 1. Places in Canada where I collected *Lonicera caerulea*. All plants except Manitoba were collected during my sabbatical. (Manitoba was done previous to the sabbatical). The small scale of the map does not allow one to see all 184 Canadian sites; sites were at least 30kms apart. L.c. was not found in either BC nor NWT despite a week spent in both locations. Newfoundland was not visited.

Figure 2. Some of the people involved in gathering haskap.

Wild *Lonicera caerulea* was found in: seasonal streams, openings in deciduous boreal forest where fallen trees were decomposing, high calcium soils, and disturbance areas near road construction. It was never observed to be a dominant species and was not as common as other *Lonicera.* It seems highly unlikely that this species will ever be invasive. Mainly it grows in areas where trees are doing poorly, in wet areas and partly shaded. It may be an understory plant adapted to low light levels. Figure 1 shows areas in Canada where plants were gathered.

High diversity was noted among wild accessions gathered in Canada. Variation in leaf size, disease resistance, plant height was noted. Some plants were found close to salt water and most berries tasted were good flavoured. Compared to cultivars, wild plants had very small fruit. It is hoped that these plants will be valuable in providing hybrid vigour, disease resistance, and adaptation to Canadian growing conditions. Japanese accessions will undoubtedly contribute large fruit and good fruit shape in future breeding efforts (figure 3). However, Japanese Haskap lacks characteristics needed for mechanized harvesting which can be found in Russian and probably Canadian germplasm. In the years to come this germplasm will be studied and shared with genebanks around the world.

Figure 3. Japanese Haskap with exciting large fruit, most of which have the desired round or oval shapes. Some fruit was twice the size of the largest fruit grown at the University of Saskatchewan! Too bad the largest fruit was rather fragile. Seeds were saved from all the fruit shown.

Outreach & Engagement

I estimate I met with over 50 fruit researchers/extension agents and talked to over 300 growers & fruit processors in Canada and Japan during my Sabbatical. At least 80% of these people and institutes I had never visited before. The Sabbatical also allowed colleagues to become aware of the University of SK's fruit program and many possibilities for future collaborations were planned. See Table 1.

Table 1. Summary of Outreach and Engagement activities on Bob Bors Sabbatical.

Institute / group	Province	Activity
Saskatoon growers	MB	Gave talk to growers, tour of research plots
Sask Fruit Growers	SK	Spoke at annual meeting
Sask Ag	SK	Meeting with Provincial fruit specialist
U of Calgary Herbarium	AB	Meetings with Herbarium staff, viewed botanical records
Fruit Growers	ON	Visited 6 growers
University of Guelph	ON	Meeting with several fruit breeders
U of G Herbarium	ON	Wet with researchers about 'DNA barcoding' and looked at botanical records
U of G Arboretum	ON	Collected seeds of about 30 *Lonicera* species
Royal Botanical Gardens	ON	Tour, Part of PTP 2 grant
Wineries	ON	Toured several wineries
Niagara Fall Arboretum	ON	Tour, Part of PTP 2 grant
Ag Canada, Clonal Genebank	ON	Tour
Thunder Bay Herbarium	ON	Review records, meeting
University of Guelph Research Station at New Liskeard	ON	Tour and meetings regarding their tissue culture lab and virus free techniques
Phytocultures Ltd.	PE	Gave talk to growers about Haskap, Toured lab and greenhouses, Gave advice, met researchers and extension agents who were also speaking at the grower meeting
Vegetolab Inc.	QC	Toured lab and greenhouses, Gave advice, many meetings, They helped gather wild Haskap
Les Buissons research center	QC	Tour facility, meetings, plant gathering
Provincial Research Centre	NB	Met with Fruit extension agent, searched for wild L.c.
Ag Canada	NS	Meetings, tour
Nova Scotia Agriculture college	NS	Talk to faculty and staff regarding U of SK Fruit Program, meetings, tours of research plots and labs
Organic Agriculture Centre of Canada	NS	Meetings on possible collaborations
Blue Berry Isles	NS	Meetings, found wild Haskap together
Vavilov Institute	Russia	Researcher visited me for a month, helped collect Haskap, many meetings for PTP2 grant
Haskap Breeding program	OR, USA	Assisted with early season evaluations, helped set up netting, meetings, collected seeds
USDA Fruit Genebank	OR, USA	Gave talk to researchers, tours, meetings
Various Companies	Canada	10 new propagators of our fruit varieties were added during this period. In most cases, I was directly involved in negotiations, arranging for plant material and answering questions.
Various Web articles	U of SK	8 new or revised articles were written for our website. Much information was gained during the sabbatical that can be used to write more articles.

Acknowledgements

I sincerely wish to thank the University of Saskatchewan for providing me the opportunity to have this sabbatical. The U of SK provides 80% salary for sabbaticals lasting a year as well as a $5000 grant toward expenses. Much of the remaining expenses were paid from letting my annual 'Professional Expense Account' build up (this too was provided by the U of SK) and royalty income from propagators of our fruit varieties. Also the PTP II grant from USSU provided funding that allowed a Russian fruit researcher to visit me for a month touring researchers and gathering wild Lonicera caerulea in Ontario. Most important for last: my wife (Loretta) and the kids still at home (Aurora and Nick) made tremendous sacrifices and 'covered for me' at home during my frequent long absences.