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ABOUT TALES OF ALES:

TALES of ALES: Celebrating the Past, and Changing the Future - Stories about some University of Alberta Plant Science Professors and their activities from the past

The TALES are a series of stories written in retirement by Keith Briggs in 2021 – 2023 as Emeritus Professor of the Department of Agricultural, Food and Nutritional Science (AFNS), Faculty of Agricultural, Life and Environmental Science (ALES) at the University of Alberta. The TALES place into the record some notable agricultural science events and related activities for the Archives, stories not previously told or elaborated that may be of interest to the academic, scientific and public communities. They feature Professors or other staff all found in the history of AFNS.

ABBREVIATED TITLE:

TALE of ALES #5: Regional Plant Variety Adaptation Research (2015 – 2023), helping the public decide which agricultural, horticultural and amenity plants they should grow

FULL TITLE:

TALE of ALES #5: Crop homesteading in Alberta, and the vital role of the Faculty of Agriculture (1915 – 2023), helping the public decide which agricultural, horticultural and amenity plants they should grow – then and now

AUTHOR:

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ACKNOWLEDGEMENTS:

The contributions of horticultural information and reviews of the final script by retired horticulture Professor Ed Toop, Mr. Gabor (Gabe) Botar (Faculty instructor) and Mr. Brendan (Casey) Casement (a career long Provincial leader in horticultural extension) were essential for the horticulture section of this script to be completed, and they are gratefully acknowledged, as are the reviews by Drs. Brian Beres. Professor Zenon Kondra, and by staff at the University of Alberta Botanic Garden. Several non-scientists also read the script and all suggestions, editorial comments and corrections received are gratefully acknowledged here.

ABSTRACT (Another rather long one!):

Tale #5 has a very broad scope that describes the role Professors of the Faculty of ALES and some other agencies in crop and variety testing since the Faculty was first established in the early 1900's, in helping settlers on the Alberta farmlands make the right choices about what crops and varieties they should grow that would be best adapted to their region and homestead. It is a story that is over 100 years long and describes University R&D programs that supported the crop information needs of growers from the era of homestead settlement in Alberta by immigrants and all the way through to the needs of farmers now operating 21st century high technology crop agriculture. Based on their research trials of the very diverse source s of different varieties of seeds that immigrants brought with them from other places to Alberta, Faculty staff provided the very first source of crop and variety adaptation science-based data descriptions then used to

recommend the best varieties to grow in different crop zones in Alberta. Most of the seed sources that the homesteaders brought with them from elsewhere were very poorly adapted to the harsh, short season conditions found in Alberta. Because even the new varieties from central Canadian Government breeding programs lacked in local adaptation, academics at the newly established University of Alberta immediately started breeding and releasing locally adapted varieties for use in Alberta conditions. These programs continue today and that plant variety breeding story about the University of Alberta story is told separately in TALE of ALES #4.

Even non-agriculturalists will recognize that successful crop production depends on the convergence of favorable conditions in each field, each with its own local constraints. Negative factors that can diminish yield and quality potential include soil type and soil nutrient levels, drought or excessive moisture, wind, hail, diseases and pests, season length and general growing conditions, harvesting conditions, weed control and sub-optimal crop management choices and conditions (such as seeding date delayed by rains etc). Some of these are under the control of the grower, but many are not. In addition to all of these, however, choice of the wrong variety for local conditions is actually the most important controllable bad choice that could lead to a poor outcome. Access to a scientifically developed, independent data set that describes all the available varieties is essential for growers to make their best choices. This story is about how the University of Alberta professors contributed their services to creating that essential database over the years, as well as recent organizational change in that vital research role in support of growers. Their contributions included this work with plants of agricultural, horticultural and amenity value to the rural and urban public throughout Alberta. Information is also included in TALE #5 about some the important components of the very varied agroecology constraints and conditions that influence cropping outcomes in different parts of the Province.

Part 1A starts at the beginnings of crop agriculture in Alberta and presents a brief overview of the broad geopolitical and historical events affecting the administration of land allocation and settlement for immigrants. Depending on where their homesteading land was allocated the settler's needs for different crops and crop varieties would have been different. This reflects the very wide range of crop ecological conditions found throughout Alberta (briefly described in the Appendices of this TALE). Part1B focuses on some details of those conditions and challenges that faced immigrants who wished to develop crop-based homesteads in what at that time were the new lands of the Western Canadian Prairies, later to be known as Alberta.

One section of Part 1 describes three important eras of homesteader transition, each with very different labor inputs and crop uses. Era 1 was where settlers used mainly their own human labor for clearing bush/land, with a focus on food production to feed their families, alongside a goal of starting to grow wheat as a cash crop for sale when enough land was cleared for that. Era 2 was when Era 1 success created enough funds to buy a horse(s) (or oxen) so that animal powered equipment could replace the human labor. This era required feed-crops such as oats to be successfully grown to feed the animals, plus expanded cash cropping to pay for enclosed winter shelters for those draft animals then required at the homestead. Era 3 was where machine powered equipment replaced the animal power on the homesteads, which in turn required expanded cash cropping for equipment and fuel, but encouraged diversification of crops to meet the growing food needs of nearly urban settlements in Alberta. Crops grown and the best varieties to markets for different uses changed greatly as these Eras progressed at different rates in different parts of the Province. Access to reliable information about the best varieties to grow for these ever changing conditions became a central key to making successful crop choices.

Part 2 describes the history of the specific Crop Variety Trials conducted at the University of Alberta over the years, started by the new Department of Field Husbandry on North Campus, with variety trials grown close to the present location of the University Club. Much of the whole North Campus was used in the earlier years for crop agricultural research until variety testing was variously moved several times to South Campus (originally Parkland Farm, later renamed as the Edmonton Research Station), the W240, Ellerslie Research Station and the St. Alberta Research Station (for agronomic and environmental research). The first Dean of Agriculture, Ernest Howes, started the first variety testing

research program in 1915 and continued with this work and the extension of this information to crop farmers until his retirement in 1940. Plant science Faculty members continued this important information transfer work at a high level through to the 1950's, both by annually publishing the newest variety descriptions and related crop production bulletins, by attendance at numerous field days on-site with farmers, and through radio broadcasts. By the 1960's this continual search for better plant varieties with special adaptation to the needs of Northern Alberta had extended beyond crop varieties, to horticultural varieties, and to amenity plants for landscaping, gardens, reclamation, home and garden use and other purposes.

Part 3A: In 1969 when Keith Briggs (this author) and Zenon Kondra were appointed as professors at the University of Alberta, respectively as specialists in cereal and oilseeds breeding and agronomy, they learned that regional variety testing throughout Alberta was no longer continuing. This had come about because of recent loss of academic staff in the Faculty qualified for this kind of research, which created a deficiency of variety description information about regional adaptation of Varieties to different zones of crop farming throughout the Province. Using funding provided mostly by the Alberta Provincial Government they initiated a 26 location variety University of Alberta run testing system for cereals and oilseeds, with annual adaptation data about new and older varieties published each spring for use by growers in different regions of Alberta. Details about this program are described in Part 3A of this TALE. The program was a collaborative testing project that involved farmers at their own locations, Alberta Agriculture. Agriculture Canada and the private seed marketing sector. Its' annual data review meetings were chaired by Briggs for many decades. In the 1990's this program was transferred from the University to Alberta Agriculture under the direction of Dr. Jim Helm, run as part of their Field Crops Research program based in Lacombe, Alberta. A more recent reorganization of this continuing and essential Alberta Regional Variety Testing program for cereals and flax program saw Ms S. Strydhorst (Sheri's Ag Consulting Inc.) appointed as the Regional Variety Trial Coordinator in a collaborative program with many Alberta partners. These include multiple grain industry organizations, Commissions, and industry, agricultural R&D and teaching Institutions in Alberta, the Alberta Government, Agriculture and AgriFood Canada, individual growers, seed producers and others. Details can be read at https://seed.ab.ca/variety-data/

Part 3B: In the early years of the Faculty under Dean Earnest Howes' leadership the variety testing, breeding, introduction and description of new plant species was also conducted at a high level in the area of horticulture, for vegetable, fruit and greenhouse crops, crop and garden use, for landscape and shelterbelt use and for other amenity uses by the Alberta public and industry. Academic staff who conducted this work included Dean Howes himself (1915-1940), George Harcourt (1915-1933), John Fryer (1920-1949), James Shoemaker (1935-1946, also Head of the newly created Department of Horticulture), and Robert Hilton (1946-1956). Later appointments who continued this tradition in their own specialty areas included Hugh Knowles (1948-1984), William (Bill) Andrew (1959-1987), Edward (Ed) Toop)1961-1986), Richard (Rick) Knowles (1986-1995) and Jocelyn Ozga(1992- continuing in 2023).

Throughout the early years the University of Alberta was the only source of scientifically collected data about the adaptation of horticultural species and varieties, based on the trials they ran on campus and elsewhere. They used Extension Bulletins, field days, open houses and radio shows to share this much in demand information. TALE #5 describes the transitions over the years about who became responsible for extending horticultural information to the urban and rural public. The years when Knowles (landscape architecture, trees, woody ornamentals, grass and turf), Andrew (vegetable crops, potatoes, general horticulture) and Toop (greenhouse crops, floriculture, general horticulture) were the Professors teaching and researching horticulture at the University, they soon found themselves swamped with the demand for their information. As a coping strategy they concentrated on widely sharing the information that was already available, with less emphasis on running trials to collect new data, although they did some of that too. Most of the University horticultural extension work was eventually transferred to the Edmonton Muttart Conservatory (opened in 1976) on the basis of the new phone / enquiry service that was established there to answer public enquiries. By the late 1900's other Alberta sources about horticultural plants had also become available at Provincial and Federal Research Centers in Central and Southern Alberta, from a few Municipal Government programs and from Olds College and other

Regional Colleges. By the early 2000's the majority of horticultural extension information is now provided by the private sector, by Municipal Gardens and Conservatories, at nurseries and by private consultants, as continually reduced budgets have caused the termination of most of these services by the University of Alberta and also, to a great extent, by the Provincial Alberta Government.

As a 25 year career Technologist in the University Horticulture program, Gabor Botar was kind enough to share with this author his career experiences in providing adapted plant varieties of fruit and other trees, shrubs and other plant species from his own breeding and selection program at the University. He these plant specimens available at no charge to Interested members of the public and to the horticultural industry as his own contribution to horticultural extension. Many of the perennial cuttings that he provided can now be found as mature plants in many different private gardens in Edmonton and in other parts of Alberta. Other plants from Botar's work can also be found in two community oriented extension projects run by students and volunteer members of the public on South Campus. One of these is the 'Green and Gold Community Garden' where urban residents can grow their own organic food and 'gain experience about gardening and food production'. Produce is sold to raise funds in support of a Rwandan Crafts project, with $435,000 so far raised since 2009. The second volunteer project is the 'ALES Prairie Urban Farm', where participants can learn about how food crops are grown as they get involved in the on-site work. Harvested product is provided at no charge to the Edmonton Food Bank, or sold with the proceeds going there.

A long-term associate of the University horticulture program, Brendan Casement, was an influential leader in the Alberta Provincial Government horticultural research and extension programs and shared with this author much about the history of those transitions. He also provided commentary about the high reputation and leadership impact that graduates from the University horticulture program from that era have brough to the horticultural industry in W. Canada over many years. Much of his shared commentary is presented in Part 3B of this TALE. Very regrettably, that very popular undergraduate horticulture major specialization. at the University of Alberta had to be closed down in the 1990's when all three Professors retired, since severe budget cuts imposed by the Alberta Government did not allow for sufficient academic staff replacement in horticulture. Fortunately for potential career horticulturalists Olds College, a long-term associate of the University in education and research, has now established a BSc specialization in Horticulture. Its present role in variety R&D and extension to growers is briefly described in this TALE #5.

Part 3C: Another important extension facility for access by the public to adaptation data about plants suited to Central and Northern Alberta was established in 1959 with the creation of the 95 hectare University of Alberta Botanic Garden (UABG, the name assigned in 1971). This garden was originally managed by the Faculty of Science, later by the Faculty of ALES, and from 20022 by the University of Alberta Division of Facilities and Operations.

Details about the University of Alberta Garden can be read at https://www.botanicgarden.ualberta.ca/

The UABG is the largest botanic garden in Alberta and collects and maintains a diversity of plant species, 'with emphasis on cold-hardy plants that can survive harsh extremes of the Canadian Plant Hardiness Zone 3 climate'. Its' specialty research is about native species, plant diversity and plant conservation. It has unique collections of alpine and local native species, maintains a Native People's Garden and also a collection of aboriginal medicinal plant species. New facilities include a fully digitized herbarium, instructional facilities, featured gardens, greenhouses and indoor and outdoor collections of many horticultural species of interest to the public, the horticultural industry and to researchers. Collections featured in 2022 included, Annuals and Perennials, Fruits and vegetables, Herbs and Sensory Gardens, Lilacs, Lilies, Primula, Peonies, Roses, Trees and Shrubs, and Trial Gardens. The gardens serve as a major destination for Albertans and tourists, with visitor numbers in the 100's of thousands per year. As a University Facility providing both formal and informal instruction about plants and their ecology. The UABG has in recent years served as an important information genetic resource for the use of adapted native and other endemic Alberta wild plants for both reclamation, horticultural and amenity uses.

Of special note at the Garden is the unique Aga Khan Garden funded by the Aga Khan IV, finished in 2022 with the addition of a pavilion. It is the Northernmost Islamic Garden that exists in the world, was completed at a cost of $25m, and is now a singular tourist and local attraction in the central Alberta region. The Kurimoto Japanese Garden is also another distinctive feature which visitors enjoy at the Garden.

TALE #5 concludes with a fitting statement found on the UABG website that applies to those who study plants in order to identify the best locally adapted plants and their best uses of value to the human condition. The UABG states 'We grow plants to connect people with the earth so that they cherish the essence of life'.

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Full Title:
TALE of ALES #5: Crop homesteading in Alberta, and the vital role of the Faculty of Agriculture (1915 – 2023), helping the public decide which agricultural, horticultural and amenity plants they should grow – then and now

Part 1A: An overview of some broad geopolitical and historical events affecting the administration of land allocations to immigrants

In their Chapter in The Canadian Encyclopedia entitled 'History of the Settlement in the Canadian Prairies' Friesen and Mcintosh (2019) describe six 'great waves' of immigration from prehistory to the present, as immigrants occupied the lands later to be known as the Province of Alberta. In point form those waves were as follows:

- About 13,300 years ago: From Asia, resulting in an indigenous population of 20,000 to 50,000 by 1640
- 1640 – 1840: Several thousand European and Canadian fur traders, followed by several hundred British immigrants, with a major settlement in the Red River Colony (later Manitoba, with many local Metis aboriginal people) and dozens of small outposts across the W. Prairies to serve the fur trade
- 1840 – 1890's: Canadians with mainly but not only British heritage
- 1897 – 1929: The largest wave, mostly Europeans, paused from 1914 – 1922 following the First World War
- 1940's – 1960's: Drawn from other Canadian Provinces, from Europe and from other countries
- 1970's and onwards: From many different countries, especially from the Southern hemisphere

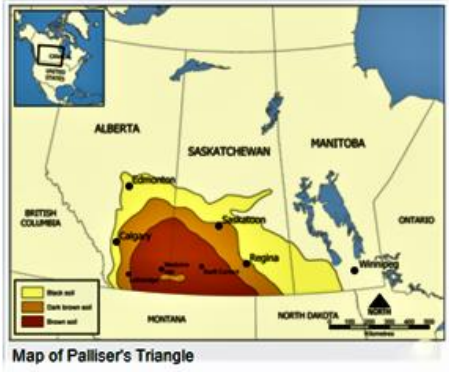
The subject matter of this Tale #5 was of particular importance to the immigrants of the fourth wave, as this was not only the largest wave, but was also the period when the University of Alberta with its new Faculty of Agriculture and its own Departments of Field Husbandry and Horticulture were all formed. Research about crops and varieties by the latter would provide vital information to the new farmers in the region as they sought the best varieties and cropping practices that would ensure the success of their new homesteads. However, wherever they settled there was always a major residual effect from the prior history of the region, so some information about those circumstances is presented here.

The W. Canadian areas later settled for agriculture were initially explored during two consecutive Prairie drought years between 1857 and 1859 by John Palliser, an adventurer/explorer sponsored for this survey by the Royal Geographical Society of England. He reported that the area which he called the Palliser Triangle (Figure 1A) was 'more or less an arid desert, thus unsuitable for crops, and unsuitable for settlement'. Notwithstanding the later comment he noted that much of the Triangle might be suitable for livestock, 'having a dry climate, sandy soil and extensive grass cover'. The generally negative crop agricultural assessment from the Palliser report was completely reversed following a subsequent survey of the same area in some wetter years in the 1880's by John Macoun, an English botanist. Macoun concluded that farming could be viable there, especially for wheat production. In many ways both were right, as in subsequent decades including current times, crop producers in the Palliser triangle have enjoyed banner years for crops, but have also suffered years of devasting drought (such as thus far in the 2020's).

In the earlier years between 1670 to 1870 the major agency involved in the Canadian fur trade was the Hudson's Bay Company (HBC), operating by charter of King Charles II of England, with Prince Rupert of the Rhine as its First Governor. Under duress from England HBC sold the area they controlled (called Rupert's Land, Figure 1B), to the Canadian Government in 1869. When Macoun reported that much of this land could be settled and be suitable for wheat production the Governments of England and Canada both engaged in promotions to encourage immigration, as did the HBC and the Canadian Railways that were being built towards the west. All of these agencies wanted the population in W. Canada to increase substantially to support their vision about how the West could develop, and how overall prosperity would be

enhanced. This would be the result particularly through agricultural production, and homesteaders would make that happen. Timely passage of the Canadian Dominion Lands Act in 1872 (Friesen, 1987) allowed immigrants to purchase

Figure 1A Palliser Triangle (1860) Figure 1B Rupert's Land (shown in yellow) Figure 1C (District of Alberta named)



(Figure sources: Wikipedia ©)

160-acre tracts of unbroken land from the Government 'for a token fee of ten dollars'. This seemed to be a very good proposition for potential new immigrants looking for a better life for their families, or to escape persecution, cultural, ethnic, discriminatory or other difficult circumstances in the countries and regions which they would leave. (Author note: In earlier years settlement promotional programs had offered only 30 free acres, but a number of obligations were also attached to that offer, described later). As described at length in the University of Manitoba Archive about Immigration Policy (Anon., published online in 2005) the specific policies controlling who might be a suitable immigrant to Canada to become a farmer, and the specific parcels of land to which they could gain access, changed greatly over the decades. They reflected a very controlling deep Euro/British colonial view common at the time that viewed many potential immigrants as being quite unsuited for joining the Canada that the incumbents envisaged. Many applicants were rejected simply on the basis of racial bias (Anon. 2005). However, that disarming aspect of the colonization of Canada is not one needing further description here or significantly relevant to this present story, about plants. (Yes, I am soon getting to that!)

The economic status of applicants did however always provide a distinct discriminatory bias for acceptance as an immigrant. More wealthy applicants with their greater funds could choose to purchase superior land parcels either from the HBC or from the CP Railways, to whom the Government had already ceded the very best agricultural land to be made available for direct sale at negotiable prices. This resulted in two classes of homesteaders: (a) Those who had extra funds and resources and bought the better properties, which usually were in treed areas with higher rainfall and better soil types more suitable for a diversity of agricultural activities, and (b) much poorer homesteaders, those who arrived with absolutely no extra resources or funds available and took up the much less desirable 'free' parcels available from the Government, usually in the dry central areas of the Palliser Triangle, that lacked the resource of trees on the property and received only limited seasonal rainfall. The prospect of 'free land' was initially also very attractive to many US grain farmers who had already acquired considerable experience in farming US drylands of that kind, but wanted to leave the US often for socio-political or other reasons, and chose to move to Canada. The drought prone 'dirty thirties' later brought with them chronic soil erosion and wind-blown loss of the topsoil with an associated lack of any further ability to grow viable crops. Many settlers in the driest parts of the central Palliser Triangle faced bankruptcy from this and had to move elsewhere or to the cities for work as low-paid laborers, if they could find work at all. In some of these areas so much topsoil was lost that farming there was never resumed, such as in some parts of SE Alberta.

(Author note: There was also a very significant interest from Europe and from the USA for access to much larger blocks of land that might be available near the Rocky Mountains, by those who wished to run large ranches there for production of cattle and/or sheep. The development of those ranches and information about the management of the native and other forage species on those lands is not included within the scope of this Story #5 of TALES of ALES).

The name 'Alberta' did not appear on any map until 1882 when the Government of Canada established formal Districts and Territories across the Dominion. An example of its early appearance on a map is shown in Figure 1C, where the 'District of Alberta' is designated as a 'Provisional District of the NW Territories', located in the southern portion of the present-day Province of Alberta. Alberta itself was named after Princess Louise Caroline Alberta, the fourth daughter of Queen Victoria. Matters around land settlement, ownership and aboriginal rights in the SE part of the Western Prairie Territories (in the pink and dark pink part marked as Manitoba in Figure 1C) went on hold while the Government took care of what was called the NW Rebellion involving aboriginal land-holding interests, a rebellion led by Louis Riel in 1885.That Rebellion also led to Riel's own terminal demise. The relative national stability concerning homesteading policy that followed that event allowed significant levels of immigration to all areas of the W. Prairies to resume, the subject of Part 1B of this script.

Every immigrant who was accepted at any time during any of the immigrant 'waves' brought with them (a) their own individual and optimistic view of the opportunities that their new homestead would create for them, (b) different levels of financial and other stress on arrival, but (c) a title to their own piece of land, something that would have been a unique and exciting step forward for a great many of the family-based arrivals.

Heading West: On a train

US Sources: publicdomainpictures.net

Heading West: On a 'Prairie Schooner' wagon

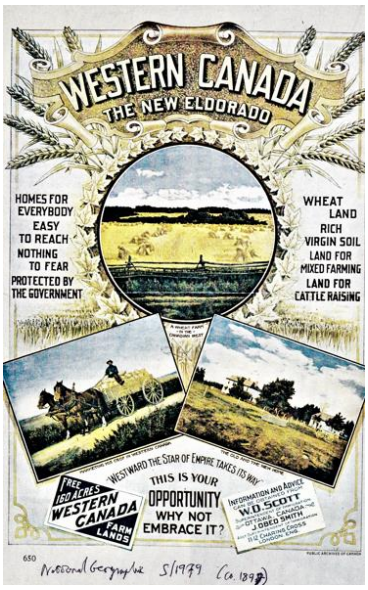
Source: spartacus-educational.com/WWagontrain.htm

The final part of their journey to Alberta would have been by rail, or by horse or ox-drawn wagon, called 'Prairie Schooners' in those times, but come they certainly did!

PART 1B: Some conditions and challenges that faced immigrants who wished to develop crop-based homesteads in the new lands of the Western Canadian Prairies that would later be known as Alberta

No matter in which of the immigrant 'waves' the new homesteaders arrived, or in which decade of the 1900's, they together experienced a very variable range of circumstances on arrival. The new arrivals varied greatly in their economic condition, some with good levels of cash ready to spend for their immediate needs, some with little to none. Most had no financial capacity to return to their country of origin if things did not work out, so had to bear down and make this major move to Canada into a success story. Some were single, others already had large families and small children to feed and educate. Some were well educated, others were not, while some had prior farming experience, whereas many had none at all. They were from very many different countries and might have chosen land holdings close to communities where prior immigrants of the same nationality had settled, so there was less of a culture shock as they were able to assimilate into a local community of like culture. By far the majority of the settlers would find themselves located in very isolated conditions, with few to no neighbors nearby and, in their first year, perhaps with no obvious means

of local transportation even for their daily needs. The nearest small town could be a day trip away. Many of the new homesteaders might know very little English, the primary language everywhere in the Western Prairies, especially in Alberta. If they were of a cultural group or nationality for which there was any local prejudice they would probably experience it immediately, at the same time as they were relying on those same homesteaders to advise and help them in their new challenge. Surely one of the most significant discoveries would have been learning first-hand about the brutality of the long and cold winter conditions in W. Canada, compared to anything most of them would have experienced in their home countries. The travel posters that encouraged them to come and farm were stimulating, but the local realities on arrival were surely salutary for many. It truly is a testament to the tenacity of the early settlers that as a group they survived those first few winters, and stayed for the long-term, and created such a solid foundation for what would become a truly successful agricultural industry in Alberta.



Recruitment posters promoting homesteading for growing wheat in W. Canada, mainly along the rail lines
(Source: Canadian Museum of History: Retrieved 30/4/2022)

In Alberta there certainly was a diversity of arrivals from different countries in the late 1800's who successfully settled their lands. The Archives report a large number arriving from E. Canada as well as from England and Wales, some from the US, and into the 1900's mostly Europeans including Scandinavians, Germans and Ukrainians. As examples, over time Norwegians tended to settle in the areas of Amisk and Beaverhill Lake and there was a major Mormon settlement at Cardston. Ukrainian settlement developed mostly to the NE of Edmonton, towards Vegreville. It has been reported that by 1905 there were 78,000 residents in Alberta, most of them farming, but with larger towns also developing to support that industry. Most of the settlements closely followed the alignment of the new railways as they were built throughout the Province. In one account the Canadian Pacific Railway role in the Canadian West was described as 'shipping in homesteaders and shipping out wheat'!

There were a number of common requirements that arriving homesteaders had to achieve on their designated piece of land whether or not they were rich or poor, or whether that unbroken land was a superior or inferior prospect for agricultural development. They nearly all involved a great deal of investment of physical labor, particularly in the earlier years, but the following ones (in list form, with comments) were common to all:

1. Fence the entire property to establish ownership boundaries. (An easier task on the treed properties with abundant lumber available for posts, but a costly task in the grassland areas that lacked trees, and where fence-posts had to come from somewhere else as an extra cash investment)

2. Build a home on the property for year-round shelter, usually the first priority on arrival for completion before the first winter. Log cabins were the first building of choice in treed areas that were mostly native poplar and birch bush. In the early years on the grasslands the lack of trees resulted in many sod/adobe shacks built and occupied for some years before agricultural crop earnings allowed for an upgrade to be built. An associated imperative was the need to establish a homestead food-garden as soon as possible to grow the vegetables and fruits that would make them self-sufficient in their family food requirements, with enough stored to make it through a long winter. Most of them brought seeds and other plant materials with them for this purpose, but many of these proved unsuitable for the local growing conditions with their short growing seasons, cool conditions and harsh winters compared to European conditions, for example. Many of the crops and varieties that the settlers brought with them were winter types that could survive the winter conditions in their countries of origin and performed very well there but would be completely winter killed in the harsh Canadian winter conditions, resulting in a total crop failure. (Winter rye varieties from N. Europe were an exception and proved to be very hardy for the Prairies). Such potential cropping catastrophes clearly needed to be avoided. Who could advise homesteaders what they should try to grow, and where would they get the seeds and plants for that, or for growing the income generating grains that they also hoped to grow and sell after the land was cleared?
3. Clear and plough the land as soon as possible to enable enough cropping to meet the basic family food needs of the homestead, and to grow mainly wheat as a cash crop to generate income. On the treed properties this was a massive task as the trees had to be cleared and the roots removed prior to ploughing, but with the upside of a consequent large supply of fuel for construction, cooking and heating. In complete contrast, settlers on the grassland properties had a much easier task breaking and ploughing the land for immediate use, but were more likely to lack wood for cooking, heating and other uses.

Many historical accounts show that new arrivals did indeed receive considerable community help in their early years, for clearing bush and preparing cropland, for quickly building modest but livable shelters for year-round survival, for the hand labor needed for ploughing, crop harvesting, threshing, transportation, and for other farming tasks. In the earliest days of the homesteading everything was done by hand, even the pulling of ploughs by men and women to break the soil for the first time, later even pulling the seeders, and later on hand harvesting the wheat with sickles. After that era horses and oxen were used as the power sources for farming equipment and for transportations, but this required homesteaders to allocate some crop production area to the growing of feed, food and bedding for their working animals and for cattle, pigs, chickens and goats etc., as well as the building of winter shelters for them all. This was a phase where growers had to be successful at growing food, feed, and forage, all the time and every year, but with little to no access to any validated local and reliable research information as to how to do that, or with which varieties, just whatever they could learn from their neighbors.

In the opinion of this author, it provides useful clarification about the cropping needs of the times to draw attention to the transition of homesteading through three different phases over the years, related to the source of power for the initial breaking of the land and for the subsequent cropping activities. Every phase required the planting of well adapted food and field crop varieties that would be suitable for their homesteading objectives and needs. Poor variety and crop choices could result in enterprise failure and bankruptcy, an outcome that can still occur for the same reasons, or by drought or flood even in the high technology Prairie cropping farms of the 21st century.

Phase 1: The very early settlement period, with only human labor available as the power source, but requiring success in managing the homestead garden and chickens etc. at a level good enough for producing the food needs of the immigrant family living there, and that for any volunteer or hired helpers

Phase 2: Transition to use of animal power (horses and oxen) for field crop farming purposes and transportation, itself requiring additional success in also growing grain and forage (particularly oat grain, forage, bedding and

cultivated forages), enough to purchase and feed those essential animals, as well to finance the building of special shelters for overwintering them

Phase 3: Transition away from the use of animals for farm power and transportation, to the use of fuel powered tractors and for crop management machinery. Achieving this stage required a well stabilized, year-round living situation at the homestead, with enough income from the sale of crop products to pay for the equipment and vehicle purchases or leases, and for other essential farm equipment including tractors, as well as fuel costs. Community sharing of resources also developed during this era, that evolved into the modern 'Coop' ownership concept.

The establishment of the University of Alberta in Strathcona / Edmonton in 1908, followed by the addition of the Faculty of Agriculture in 1915 with its early emphasis on crop and variety research in Field Husbandry and Horticulture, was very important fot the immigrant Alberta homesteaders of the fourth and largest wave (1897 – 1929). They finally acquired a source of reliable, independent, scientifically validated information about variety and crop performance not previously available. This vital service provided by the Faculty of Agriculture for the grain growers of Alberta continued unabated until the 2000's and is the focus of Part 2 of this script.

PART 2 The role of the University of Alberta in meeting the crop and variety testing needs of all Albertans throughout the Province, in the past and in the 21st Century

The first leader of the new Faculty of Agriculture established in 1915 was Dean Ernest Alberta Howes, and he provided a steady vision for its' role in providing agricultural research information and education to farmers for the 25 years until he died in 1940. Dean Howes espoused that 'Applying Science to Agriculture' would be the mantra for his Faculty, and he wrote and distributed an extension pamphlet to Alberta farmers with that title. The University Department of Extension of that era under the leadership of Alberta Ottewell, himself from a farming background, helped greatly in achieving Howes' extension goals in the early years. Despite Howes having to grow his Faculty whilst a war was going on, Alberta farmers soon came to know the University as the 'go to' place for agricultural extension information. This same view by farmers and the Howes Faculty mantra continues unchanged today, as the present Dean of the Faculty of ALES, Professor Stan Blade, quite recently wrote in the GrainsWest magazine (2020). In that article he drew attention to the Howes view of the importance of bringing the science and the farmers into continual contact, for the latter's use and benefit. Although Howes had few extension methods that he could use in his day, particularly with limited budgets during the war years, Blade highlighted the very many ways available to achieve that today. That list includes an array of options all in play almost daily at the Faculty of ALES including field-days, published technology bulletins, on-farm visits, research conferences, radio broadcasts, newspaper columns, crop clubs, field schools, 4-H activities, commodity group events, private sector seminars, trader shows, college and university lectures and scientific conferences, coffee shop hangouts, and the complete spectrum of internet information exchange systems. This activity, in the past called 'Extension Delivery to Farmers', today operates under a number of new labels, including 'Information Exchange' (IE), 'Knowledge Translation and Transfer' (KTT) and 'Results Driven Agricultural Research' (RDAR). Growers care very little what the process is called but do need this activity to be continually happening with the most current information being transferred on a regular basis.

Of course, (this author notes) not much of that goal works very well for anyone if you do not have a useful and current continually updating new data set available to share! Dean Howes and his team immediately set about creating that database for farmers to use in their cropping systems, particularly concerning crop variety choice for growers, and that emphasis has persisted in the Faculty for more than a century.

As a Dean, crops expert, instructor and also first Chair of what was then called the Department of Field Husbandry Howes and his staff acquired seed of the many different varieties of grain crops that homesteaders were already using on

their farms and had brought with them from Europe and other countries. In their then novel science-based field tests they compared the local adaptability performance of those varieties with that of any new varieties from other parts of Canada that local and other growers were using in W. Canada, and with other new varieties bred in N. America. Over time some of those new grain crop varieties were bred by staff at the University of Alberta (separately described at length in TALE #4 by Briggs, 2023). For this purpose the Faculty itself cleared much of the land on the original campus site, and initially obtained use of 80 campus acres for their grain crop variety trials, also used for growing grain and fodder for their draft and teaching program animals. A 1930 photo (Fig. 1A Source: Gillespie, p12, 2014) shows those kinds of trials underway close to the Saskatchewan River, adjacent to where the University Faculty Club is now located. Such testing had already been expanded in 1920 to the newly acquired Parkland Farm (Fig. 1B) later known as the Edmonton Research Station, eventually renamed again as South Campus. Land use pressure for new academic buildings on campus forced the plotwork to move once again in the 1980's to the South end of South Campus (Fig. 1C Source: Briggs. Aerial view circa 1997 from a nearby student residential tower). In recent decades expanded regional adaptation trials of new varieties has also been conducted at many other Federal, Provincial and seed company research centers throughout the Province, as well as on farmer fields.

Figure 1A (Source: University of Alberta 1930)

1930 Variety testing for farmers, University of Alberta North Campus

Figure 1B (Source: Briggs 1972)

1920 – 1982 Edmonton Research Station (ERS)

Figure 1C

Variety trials on South Campus (Source: Briggs 1991)

Figure 1D

Regional variety trial plots (Source: Briggs 1991)

When he started work at the University of Alberta in 1969 Briggs was appointed Farm Director and came across many files of field experiment results from variety testing from the earliest years of the Faculty, stored in sealed boxes in the seed storage room at the ERS. This was a 'time-travelling brush with the past', and the 'not to be lost' boxes were sent to the University Archives but have likely not seen the light of day since then! In 1969 the newly appointed plant breeder Professors needed to free up this facility for actual seed storage for their new grain crop breeding programs in oilseed crops and spring cereals.

Part 3 The creation and delivery by the University of Alberta of a rigorous 30-year long and continuing Alberta Cereals and Oilseeds Regional Variety Testing (RVT) program

Intoduction and Overview

In addition to its role developing new varieties and studying the genetics of crop plants for 100 years (Briggs, 2022) the Faculty continued to provide a field testing service evaluating introduced and locally bred varieties of field-crop, horticultural, ornamental and woody plant species, sharing its results annually with the farming and urban public. In cereals, oilseeds and forages it was the only institutional source of local Alberta information for immigrants up to the 1940's. It provided research-based information about which of any introduced varieties would be most suitable to grow on the newly cleared settlements being created throughout the uniquely variable climate regions and soils of Alberta. The data would also be useful for determining which varieties might be more risky to grow.

A comprehensive Province-wide Regional Cereal and Oilseeds Regional Variety Testing (RVT) Program was re-established by plant breeders Briggs and Kondra in 1972, in collaboration with and funded by the Alberta Provincial Agricultural Department. Eighteen years later, in the 1990's, the management of the program was taken over by the Field Crops group of Alberta Agriculture at Lacombe, as part of their Feed Grain Development Program, a cereal feed-grain research program incubated in the Department of Plant Science between 1973 and 1978 and led by Dr. Jim Helm. The annual output from the ongoing variety adaptation research was the Alberta Cereal and Oilseeds Regional Variety Description Publication of the Alberta Government, which annually updated and described the performance of new and older varieties available for growers. A special feature of the program was the collaborative advisory and management committee involving the University of Alberta, Alberta agricultural colleges, the seed industry, seed growers, commodity groups, producers, extension organizations, and the Provincial Agricultural Department. This essential service for farmers will always be needed, and the Faculty of ALES can take credit for identifying and acting on this need in its very earliest years, and subsequently. The renewed RVT program was chaired by Briggs for over 20 years until his retirement in 1999, and even in 2022 plant breeders at the Faculty continue to have an advisory role in this important extension program.

Similar variety evaluation work was also conducted by the Faculty throughout the last 100 years for forage crops, horticultural crops, fruit crops and ornamental species, and for vegetable crops especially potatoes, laying the foundation for a modern and vibrant Alberta industry with many of these species, especially potatoes. Also of note were the flower trials carried out on South Campus for the All-America Selections program, now continued at the former Devonian Botanic Garden (later renamed the University 0f Alberta Botanic Garden). Research, conservation and demonstration plantings of native and horticultural plant collections and introduced species are still continued on a large scale at the University Botanic Garden near Devon and are annually viewed by thousands of visitors. Many varieties chosen from these trials can be found in the gardens and parks of Alberta citizens and are also used in land reclamation projects.

More detail about these extension activities are presented in the following three sections of this Tale #5 of TALES of ALES:

Part 3A: The Briggs / Kondra Alberta Cereal and Oilseeds Regional Variety Testing Program, started in 1972

Part 3B: Horticultural extension activities by Faculty of ALES Professors, and other information sources for the Alberta public and the horticultural industry

Part 3C: The extension and other roles of the University of Alberta Botanic Garden (UABG)

PART 3A The Briggs / Kondra Alberta Cereal and Oilseeds Regional Variety Testing (RVT) Program

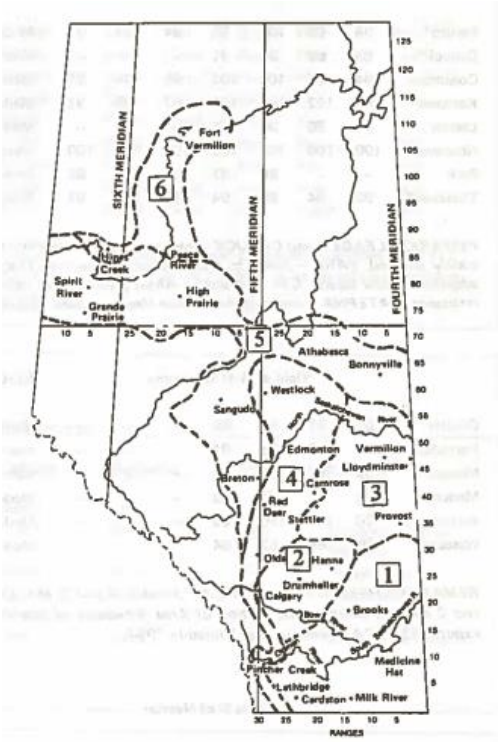
Appointed at the University of Alberta in 1969 as cereal and oilseeds breeders, respectively, Professors Keith Briggs and Zenon Kondra quickly learned that there was only a very minimal amount of variety trial data generated at just a few Alberta sites during the formal Cooperative Registration Trials that were conducted prior to the registration approval of any new cereal or oilseed variety for W. Canada. This registration process was governed by regulatory oversight of the Canadian Government. (The details of that regulatory process can be read in Briggs and DePauw, 2022, as it pertained to the registration of Glenlea spring wheat). The Alberta 'Coop Trial' testing of potential new varieties was limited in the 1960's to a required three consecutive years of testing for any potential variety, but to only four Alberta locations, at three Agriculture Canada Research Stations at Lethbridge, Lacombe and Beaverlodge plus the University of Alberta location in Edmonton. The University of Alberta in 1969 continued its' past role as a cooperating site for Coop trials of rapeseed, canola (just then emerging as a potential new crop), flax, spring wheat, oat and barley, and fall rye. Fewer Coop trials were grown in later years by The University of Alberta as budgetary considerations reduced that service only to the grain crops for which the University had ongoing breeding programs. This 'Coop' testing service was all unfunded work but was part of an exchange of research services as the University benefited from other research institutions across the Prairies who were testing University of Alberta lines entered in the Coop trials, which other collaborators also grew without charge.

Briggs and Kondra were not the only agronomists of the day who realized that the average variety performance of varieties at only four locations was most likely a very poor predictor of the adaptability of individual varieties throughout agro-ecological areas as diverse as those found on the very extensive acreage of grain cropping lands of Alberta. Individual farmers need data that best predicts performance at their own particular location, and this 'average' data could not possibly predict that very well, only an 'average' performance. Some years later Dr. Brian Beres completed an MAg in the Faculty with Briggs, for which his research project evaluated the need for an RVT program. His results endorsed the opinion of Briggs, Kondra and others in support of the need for running Regional Variety Testing.

In 1969 Alberta agronomists delineated just four Crop Zones for all of Alberta (plus a separate 0.5 million acres of irrigated land in the South that was mostly used just for soft white wheat at that time). The 'Four Crop Zones' map is illustrated in Figure 2A (Source: Alberta Cereal and Oilseeds Advisory Committee Variety Descriptions pamphlet, 1969).

Figure 2A: Four Alberta Crop Zones (1969)

Figure 2B: Six Alberta Crop Zones (1984)



The four Coop trial site locations of the 1960's gave no representation at all to Crop Zone 1 of Alberta, nor to the northernmost part of Crop Zone 4, whilst the two sites in Crop Zone 3 were not very different in their agro-ecological characteristics, so generally provided similar results. The question to be answered was whether, if many more regional testing sites were used that better represented each grain crop in the area where that grain was mostly grown, would significant local adaptations of individual varieties be identified that farmers could better exploit? Briggs and Kondra, both of them plant breeders with experience in studying the local adaptability of plants to the conditions where they were grown, expected that the answer would be yes. They persuaded the Alberta Government to fund an extensive Alberta Regional Variety Testing (RVT) program starting in 1972, to generate data that would allow growers to make better variety choices for production in their specific production fields. A steering committee representing plant breeders, farmers, practicing agronomists and members of the seed trade was appointed to assist Briggs and Kondra in this project, and Briggs was appointed as its Chair, and remained so for many years.

What was done, and what was achieved?

1. Starting in 1972, the new Briggs / Kondra Regional Variety Testing (RVT) yield trial program for spring wheat, barley, oat, flax, and rapeseed / canola was managed by the University for many subsequent years at up to 20 to 25 different locations per grain crop throughout the Province, proportionately representing the different production grain areas by crop acreage as best as possible. (Author note: Alberta cropping regions have a much greater variability in agroecological conditions that affect crop growth than is found in the other Prairie Provinces of Manitoba and Saskatchewan. A summary describing some of those differences is provided in Appendix 1). Initially all the regional trials were completely handled by the University of Alberta mobile field crews based in Edmonton. Delbert Degenhardt was the first lead technician for this program, and later became an accredited canola breeder with Dr. Kondra. This work involved very high costs for travel expenses and the field crews that operated from Edmonton could not always respond well to

changeable weather conditions at distant locations. As the program quickly gained recognition from the cropping community and with extension and crop research organizations in the Province the program switched to paying local research cooperators to grow and manage the more distant trials. Cooperators received a sub-grant to conduct trials at those distant locations based on a 'per plot' cost basis, which not only lowered operating costs, but also improved the data quality and success rate of individual RVT trials throughout the Province.

2. Entries in the trials were limited to agreed long-term check varieties, usually the ones most widely grown by farmers, plus recently registered varieties and 2nd and 3rd year entries in the Coop registration trials. By the time any of the latter were actually registered, or seed of newly registered varieties was available to growers, Alberta would already have one or two years of data about them from multiple Alberta locations. After usually three years of testing in the Alberta regional trials new varieties would be dropped from the trial and their data-set 'frozen' in the extension bulletins, to make room in the trials for newer varieties coming forward each year. In addition, and comprising a significant improvement in the kind of hands-on 'what you see in this field trial is what you will get' extension information available to growers, field days for local farmers were encouraged at all Alberta RVT trial locations, to view the newest and latest varieties going forward. At the same time as program technicians collected variety performance and disease reaction data on the varieties growing in all locations, growers could actually view the performance of all of those potential new varieties right there in a production field close to where they farmed (Figure 2A, 2B Source: Briggs 1970's). Many of the sites used for the RVT were on the production fields of growers, and that approach was maintained throughout. This ensured that field testing conditions represented the realities of on-farm crop production conditions, not just the often near-perfect management conditions found on research stations.

3. In 1984 analysis of the new and much larger, multi-year data sets about all the grain crop varieties under test led to a redefinition of the Alberta Crop Zone districts and borders that had been in use for so many years, and the number of Alberta Crop Zones was increased from four to six. (Figure 2B). From that time onwards annual review of the data later suggested that significantly increasing variability in climate and local weather patterns was leading to perhaps as much variability in local variety adaptability within Crop Zones as between Crop Zones in Alberta. As a result of published scientific papers on the topic, and specific requests from growers on the Regional Variety Testing Advisory Board, by 2021 the Alberta Regional Variety Testing Program eventually stopped reporting variety yield potential on the basis of the

Figure 2A

Briggs (white shirt) at a farm-site field-day

Figure 2B

A cereal crop Alberta Regional field trial

historically defined Alberta Crop Zones, and adopted a new concept first brought forward earlier by both Briggs and Helm. The program switched to reporting variety yield performance on the basis of trial site data averaged according to 'Yield Test Category', the average yield of all varieties in the trial at each location. Alberta is the only Prairie Province using this method of describing variety yield potential, but Alberta grain growers have indicated that it helps them to more easily

choose varieties suitable for growing in fields where they are targeting either lower or higher yield outcomes. An example of this new format in the annual data information bulletin for grain growers is shown in Table 1, reproduced from the Alberta 2021 Alberta Seed Guide for malting barley variety descriptions.

Table 1 2021 Description of Malting Barley Varieties for Alberta (Source: 2021 Alberta Seed Guide)

MALTING BARLEY

					Yield Category (% CDC Copeland)		Agronomic Characteristics:					Disease Tolerance:					
															Net Blotch:		
Variety	2 or 6 row	Awn Type	Overall Station Years of Testing	Overall Yield	Low < 113 (bu/ac)	High ≥ 113 (bu/ac)	Maturity Rating (Days +/- CDC Copeland)	Test Weight (lb/bu)	TKW (g)	Height (cm)	Resistance to Lodging	Loose Smut	Other Smuts	Scald	Spot form	Net form	Spot Blotch
Varieties tested in the 2021 trials (Yield and agronomic data only directly comparable to CDC Copeland)																	
CDC Copeland (bu/ac)				108	86	138											
CDC Copeland	2	R	147	100	100	100	98	51	50	84	F	MS	I	S	I	I	S
AAC Synergy	2	R	30	105	109	104	0	51	51	80	F	S	I	S	R	MR	R
AB BrewNet	2	R	38	108	110	107	2	50	50	86	G	MS	MR	I	I	MS	I
AC Metcalfe	2	R	147	99	100	96	-1	51	47	79	F	R	I	S	I	S	I
CDC Churchill	2	R	32	110	113	109	0	52	49	74	G	MS	MR	S	MR	MR	I
CDC Copper	2	R	32	108	115	106	-1	51	49	72	G	I	MR	MR	MR	MR	I
Torbellino	2	R	15	106	110	102	1	50	51	70	G	S	R	I	MS	MS	MS
Previously tested varieties comparable to CDC Copeland																	
CDC Copeland	2	R	147	100	100	100	98	51	50	84	F	MS	I	S	I	I	S
AAC Connect	2	R	48	101	102	100	-1	51	50	80	G	S	R	S	MR	I	MR
CDC Bow	2	R	38	101	102	100	0	51	48	77	VG	S	I	MS	MR	S	I
CDC Clear (hulless) †	2	R	31	92	90	94	1	62	47	85	G	R	R	S	R	MS	I
CDC Fraser	2	R	37	106	107	105	0	51	49	76	G	R	MR	MS	MR	MR	R
CDC Goldstar	2	R	34	108	109	107	-1	53	49	86	G	I	R	S	MR	I	I
CDC Kindersley †	2	R	36	100	98	102	-2	53	43	78	G	S	R	S	MR	MS	I
CDC PlatinumStar †	2	R	38	103	105	100	0	53	49	82	F	S	R	S	MR	I	S
Cerveza †	2	R	39	106	105	106	0	51	46	74	F	R	R	S	MR	MS	R
Lowe †	2	R	39	108	115	104	2	51	50	87	F	R	R	MR	MR	I	I
Legacy †	6	SS	55	99	97	101	-2	49	39	82	G	I	MR	S	MR	S	MR

As an example, in Table 1 the check variety used for malting barley is CDC Copeland, to which all varieties are compared. Varieties for which no further testing is underway are shown in the lower half of Table 1. For malting barley just two 'Yield Categories' are used, those trials with a grain yield equal to or over 113 bushels/acre, and those with less than that yield level. In this 2021 summary the variety CDC Copper demonstrated superior performance in low yielding trials, compared to all other varieties, whereas CDC Churchill was high yielding under all conditions. Such varietal differences underscore the ability to identify locational adaptability by using this method and can better predict expected outcomes a farmer might achieve in fields with different grain yield potentials.

4. Changes in the sources of funding for Alberta Regional Variety funding and changes in grain crop variety research priorities over time in different crop research institutions eventually led to the responsibility for managing the Alberta Regional Variety Program moving away from the University of Alberta. It first moved first to Alberta Agriculture, Food and Rural Development (under the jurisdiction of Dr. Jim Helm of the Field Crops Development Centre, Lacombe) and later, in 2020, to the Field Crops Development Centre itself relocated to Olds College, Alberta. The relocated Regional Variety Testing (RVT) program now manages cereal and flax testing 'to provide Alberta farmers with impartial data on crop varieties', notably continuing in 2022 those very same goals started in the early 1900's by the Faculty of Agriculture at the University of Alberta. Regional variety testing of canola continued but was run separately from the RVT program by an industry wide funded consortium representing all parties in the canola industry.

A general overview of the present RVT program (2022) now describes it as a 'farmer managed program for farmers', for which Dr. Sheri Strydhorst (Olds College) is the 2022 coordinator working with the continuing RVT Advisory Committee for cereals and flax. An overview of the program can be read at the following Alberta Seed Guide URL (scroll down for the Ashley Robinson story that she wrote about it, published April 18, 2022):

https://seed.ab.ca/alberta-rvt-program-provides-an-unbiased-research-voice/

In the RVT of the 2020's the direct partnering involvement of grain crop researchers, the seed industry, farmer-based commodity groups and other funders and collaborators is very appropriately now at the highest level that it has ever been. This author lists here the very large number of collaborators and funding sources reported online for the 2021 program. (Source: seed.ab.ca 2021)

Alberta Wheat Commission
Alberta Barley Commission
Alberta Oat Growers Association
Alberta Seed Growers
Alberta Seed Processors
Results Driven Agriculture Research
Agriculture and Agri-Food Canada
Nutrien Ag Solutions
University of Alberta
Alberta Innovates
Technology Futures
SARDA Ag Research
Battle River Research Group
Chinook Applied Research Association
Gateway Research Organization
Lakeland Applied Research Association
McKenzie Applied Research Association
Olds College
Prairie Grain Development Committee
Canola Council of Canada
Lakeland College

Beyond these activities in the RVT program for cereals and flax in Alberta / BC, parallel regional variety testing systems also developed in other important crops for Alberta growers. Details about all the 2021 regional variety descriptions, research trial procedures, crop team leaders, data interpretation, funders and supporting agencies for canola, silage and special crops, as well as for cereals and flax, can be viewed at the following URL:

https:// www.seed.ab.ca/variety-trials/

This author, with Zenon Kondra, was pleased to have played a part in restarting the Alberta grain-crop RVT program in the 1970's, that led to today's rigorous program, likely still the best one in the W. Provinces, producing vital data for growers about new varieties.

Part 3B: Horticultural activities by Faculty of ALES Professors, and other information sharing with the Alberta public and the horticultural industry

1. "The extension demands and information needs in horticulture of the general public and industry are very different from those needed by the practitioners of grain crop agriculture!" (Quote from Briggs, 2022)

For many years of decades long past, before everyone had an iPhone with which to continually entertain themselves, gardening was the most popular hobby in N. America, whether it was tending to indoor plants or in outdoor gardens for aesthetic pleasure or for home-grown vegetable or kitchen herbs production. Although gardening had dropped from 1st to 10th in the ranking of hobby popularity in the USA prior to the 2020 Covid epidemic, 74% of people in the 35 – 44 years age group actually took it up for the first time as a new hobby in 2020, an amazing resurgence of interest in this very healthy, satisfying, 'low Covid risk' and mainly outdoor hobby.

A Canadian survey in 2011 indicated that while only 3.6% of Alberta families were directly involved in farming (which requires very detailed and localized crop production related extension knowledge), more than 67% of Albertans

have grown or cultivated plants at home, either indoors or outdoors, that requires extension methods and information of a much more diversified type, but more easily made available to a potentially very much larger audience. In its' early years the University of Alberta was the only Provincial source for any horticultural extension information. That changed considerably by the late 1990's, following the disappointing loss of the Faculty of Agriculture and Forestry horticultural teaching, research and extension programs and staff due to very large Government imposed budget cuts to the University of Alberta at large. Into the 2000's Provincial Government horticultural centers (for example, at Brooks), the University of Alberta Botanic Garden, Alberta Colleges (Olds College in particular), municipal facilities (eg. the Muttart Conservatory, Edmonton), public gardens, commercial nurseries, consultants and others all became the new and essential players for meeting the rapidly expanding demand for horticultural extension knowledge and activities. By 2022, with only one horticulture Professor left on staff, horticulture extension in the Faculty of ALES had necessarily fallen to a low level of priority, a very major change from the past, reflecting a lack of adequate budget to effectively continue this costly but important program.

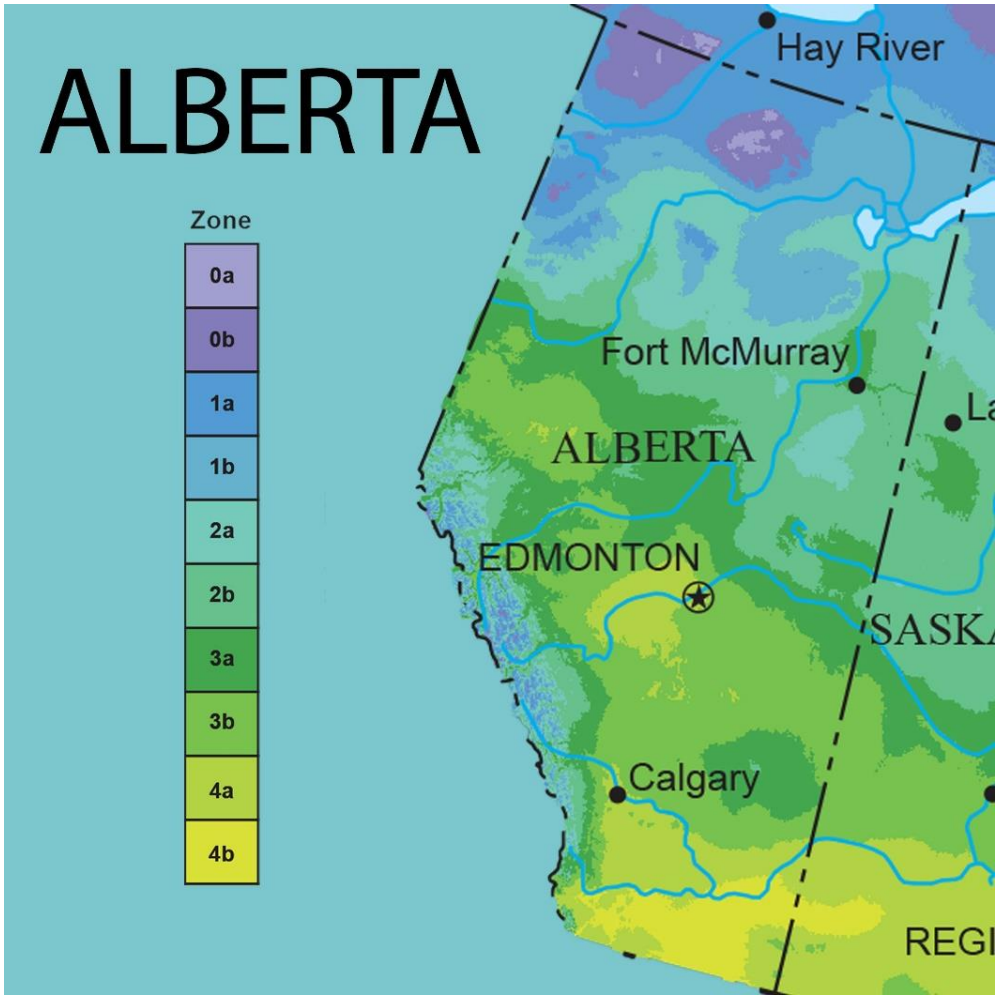
In writing this Story #5 of TALES of ALES this author found very much less residual historical information available about horticultural extension in the Faculty compared to that for the agricultural crops extension activities. It was also evident that although the horticulture Professors in the Faculty were always very active in this area in the past they used very different extension methods from those that worked best for the agricultural sector. It was also evident that, with the loss of the BSc horticultural major program in the late 1990's, and the later passing on of most of the past horticulture Professors, many of the records had also been lost. As a result, this author presents the Faculty horticultural extension history in a manner quite different from the previous section about crops extension. It focusses on the very useful and extensive information that horticulture Emeritus Professor Ed Toop kindly provided, and on that from Mr. Gabor (Gabe) Botar, all of which is gratefully acknowledged here. Mr. Brendan Casement, a major career player involved with many of the different Provincial divisions and programs concerned with horticultural extension, also provided an independent and insightful personalized account of how horticultural extension moved between different organizations from the 1960's onwards. A summary of that input is presented as Item 3 of this section. The important historical contribution of Brendan's to this part of the story is duly acknowledged here.

2. Plant Hardiness Zones: An over-riding limitation for horticultural recommendations in Alberta

The range of horticultural plant species that can be successfully grown in different parts of Alberta is predominantly limited by the minimum temperatures that they will experience, especially for perennials but also for annual species. In the latter case the length of the frost-free season between the last killing spring frost and the first killing or damaging fall frost limits species adaptability, as does the sensitivity of different species to different levels of freezing temperatures, and also the extent to which heat units accumulate at that location. To be well adapted and grow well, some species need many more heat units than others, and may require greater or lower amounts of seasonal moisture according to the species and even the variety. To help in species and variety choices for different regions Agriculture Canada developed adaptability Plant Hardiness Zone maps for Canada based on long-term weather patterns, to indicate Hardiness Zones to which horticultural species of interest might be adapted. At horticultural nurseries the recommended Hardiness Zone is indicated on the individual plants for sale. The indicated Zones are determined from climate averages, but specific adaptation and ability to survive will also depend on the local microclimate (natural or managed) and on other horticultural practices that could affect plant growth and survival. The best approach is always to buy plants that are hardier than for the Hardiness Zone for which they are being purchased, as extreme temperature fluctuations beyond the averages should always be expected. Native plants have undergone years of selection for adaptability and survival, so are well adapted to their Zone, and almost only for that reason alone are much more in demand in recent years. By contrast, potential new and attractive introduced species from elsewhere are not likely to survive in Alberta's harsh annual climate unless they are sourced from a comparable Plant Hardiness Zone elsewhere. Much of the horticultural plant adaptation research carried out by Faculty Professors over the years has focused on finding out which plants best fit in the Alberta Plant Hardiness Zones, and on management systems that also could help improve their survival and adaptability.

A simplified Plant Hardiness Zone Map for Alberta is shown here:

(Source: plantagreenhouses.com based on a Natural Resources Canada map)



Zones with a lower number (upper end of the scale) require plants that are more hardy

3. Mr. Brendan Casement recalls horticultural extension in Alberta after the 1960's (From notes in May 2022 to Briggs)

In seeking specific information about horticultural extension by the University of Alberta from the early 1900's into the 1960's this author found that there was very little detailed information available in the surviving records. It certainly was the case that the Faculty was active in that area throughout the period, and had made much use of Bulletins published by the Extension arm of the University. Mr. Gabe Botar (long-time horticulture instructor in the Department of Plant Science) advised that he was aware that many of those records had been destroyed because of a lack of establishment interest in conserving them (pers. comm). Nor were any of the other key horticulture Professors from any of that period still around to contribute personal recollections to this story.

In contrast to the absence of information for that period, several key Alberta horticulturalists were able to provide information about the nature of horticultural extension from the University of Alberta for the 1960's and into the 1990's. The first of these was Mr. Brendan Casement, who had obtained a three-year horticulture degree in the UK and then

completed his University of Allberta horticulture degree as a 'mature' student with one year of courses from Professor Hugh Knowles and colleagues in the late 1960's, about whom he shared some anecdotes (not related here!). He completed his MSc at the University of Alberta, with support from Professor Bill Andrew. As a University of Alberta horticulture program alumnus, Brendan himself became a very well recognized tree specialist during his own career and was able to provide for this article an authoritative, independent view of the state of horticulture extension through four decades. He started his career at the Brooks Alberta Horticultural Research Centre (AHRC) conducting research on trees, shrubs and flowers, and in 1987 transferred to the Alberta Tree Nursery and Horticulture Centre in Edmonton. His role there was to manage the Shelterbelt program (up to 5.0 million trees per year) until its privatization in 1997, when he retired.

Perhaps Brendan Casement grew these shelterbelt trees before they were transplanted…….?

(Photo source: open.alberta.ca shelterbelt)

Brendan gained an excellent reputation for his knowledge about all things horticultural in extension and was much in demand in that role and as a judge since 1997 for Communities in Bloom, in >100 different communities in Alberta, Canada, Britain and Ireland. Along the way he also received a Lifetime Membership and Achievement Awards from the Landscape Alberta Nursery Trades Association, and from the Prairie Chapter of the International Society of Arboriculture. Brendan always maintained strong linkages with the University horticulturalists. There is no doubt that his authoritative recollections presented here are an accurate view of the extension scene in those times, and a source much appreciated by the author. The following information is mostly based on the notes that he assembled and kindly provided.

Throughout the 1960's the University horticulture undergraduate program was the specialization with the largest enrollment in the Plant Science Department, and the industry was keen to hire the graduates as they proved to be effective employees who 'knew their stuff'. They readily gained employment in the horticultural industry, in Government extension and research positions, in Municipal positions, at teaching colleges, at nurseries, as private consultants and as extension personnel, using special publications, the press, phone-in radio shows, call centers, and TV in their work. This specialization and its knowledgeable graduates were all very well recognized in the Province and in the rest of W. Canada. In the late 1960's there were three different sources for gardening information for the public in Edmonton. They were Alberta Agriculture, the City of Edmonton, and the University. The City of Calgary used a Gardening Club as its main extension center, whilst Red Deer used Olds College. Lethbridge also used University horticulture graduates as their horticultural information providers.

Brendan advised that the University graduates were the backbone of the District Agricultural Services for horticulture but they that would often use the Horticulture Centers in NE Edmonton (Tree Nursery) or Brooks (AHRC) as a backup. All three University Horticulture Professors, Hugh Knowles (turfgrass, landscaping and woody ornamentals), Bill Andrew (vegetable crops, especially potatoes) and Ed Toop (greenhouse crops and floriculture) regularly gave lectures throughout the Province about their specialties in landscaping, greenhouse, fruit, potato and ornamental production, and were also very active with commercial horticulturalists. These lectures were often coordinated with extension courses that Brendan and others would offer at various locations. Up until the 1970's amateur horticultural extension was also well supported with small Government grants, but funding for many of those extension activities (and even to the Government Horticultural Extension Centers) was greatly reduced or terminated during the severe Provincial budget cuts imposed by the Klein era Government. (Those same cuts, at the level of a 30% cut over two years in the Faculty Department

of Plant Science caused the loss of all three horticulture Professorial positions, the closure of the University horticulture specialization, and an end to almost all further University extension activity in horticulture). In the 1980'amateur horticultural extension needs were soon quickly and necessarily taken over by private consultants, nurseries and commercial garden centers throughout the Province, with government support only left in place for commercial field production horticulture. Several new non-teaching positions in those areas lost at the University were recreated elsewhere and put in place at the then newly renamed Brooks Crop Diversification Center, South, mostly to support R&D in horticultural field crop production.

Albertan students who wish to study horticulture in 2022 now recently do have provincial access to two Alberta University program (at NAIT, Edmonton and at the University of Calgar), but can also obtain excellent Degree, Diploma and Certificate level horticultural training at Olds College, Alberta:

(Photo sources: Olds College)

Horticultural scenes at Olds College, Alberta (a 2022 'go to' place for horticultural training / certification in Alberta)

4. Ed Toop (Prof. Emeritus) recalls Horticultural Extension at the University of Alberta (Source: Toop notes to Briggs)

Professor Emeritus Ed Toop was one of the three horticulture Professors that affected so much positive influence teaching the many University of Alberta horticulture graduates who pretty much ran the Alberta horticulture businesses, government and private extension activities from the 1960's onwards. In 2022 Ed shared with Briggs some of his recollections about that role, and this section is very much based on his notes. Ed himself had completed his PhD at Ohio State University and was appointed to an Assistant Professor position in Plant Science in 1962, where he retired as Full Professor in 1986. Ed's specialization was floriculture and greenhouse crops. His cohort professor Bill Andrew had completed his PhD at Michigan State University and had been appointed in 1959 as an Associate Professor of vegetable crops (mainly working on potatoes, to support the potato growing industry in the Province). Details about Professor Hugh Knowles were described at length in Tale #2 of TALES from ALES, so that his activities with Landscape Architecture and collecting locally adapted trees and woody ornamentals are not described again here. Except for provincial potato trials run by Bill, an advisory project with growers in the Medicine Hat region in which Ed was involved on a regular basis, and another of Ed's projects testing tulip varieties for three years at Edmonton (the northernmost testing site globally for the Holland Bulb Growers) this group was not usually much involved in variety field evaluation trials such as the Faculty grain

crop breeders were conducting. Horticultural trials to obtain extension data for growers were conducted elsewhere at the Provincial Government Research Station at Brooks (some by Brendan Casement) or at the Devonian Botanical Garden, and some of that kind of testing still goes on at those locations. An apple breeding program of Bill Cumming (Agriculture Canada, Morden) initiated by the W. Canadian Society for Horticulture, tested 1000's of seedlings at eight test sites across the Prairies, of which Edmonton was one, and five new varieties arose from that program. The trials at Edmonton had to be terminated just as Dr. Toop came on staff, because of a lack of University funding for maintaining such an expensive long-term project.

Potato trials, like the ones Prof. Andrew ran

(Source: Annie Spratt unsplash.com)

Tulip trials / gardens

(Source: Matt Shalvatis unsplash.com)

Extensive notes sent to Briggs from Mr. Gabor Botar (see next section) indicates that the University did seek out and grow a large number of different horticultural plant specimens to find better plants for use by the public for these northern locations, but those were not formal trials, rather University research level investigations, and largely done by Gabe himself! Instead of running trials the University Professors found that they were most in demand for answering questions about what was already known, and what to grow where. They started a phone-in service for Edmontonians who had horticultural questions but were soon so swamped by the demand that they had to get a grant to fund this public service. They hired Brendan Casement as the first person to take over that task which later involved many other University graduate students from the Department. That demanding extension program was finally transferred to staff at the Edmonton Muttart Conservatory when it opened in 1976. With the University Extension branch the horticulture Professor group also developed a comprehensive evening course about home gardening, designed to be taught by others. It was well received and was later published in the form of an extension manual. Indeed, it was the only such comprehensive information source available at that time that covered W. Canadian Prairie conditions. It was so good that the BC Government adopted it, revamped it, called it their own and published it as 'The UBC Guide to Gardening in British Columbia', without even any reference to the original Albertan authors!

The Edmonton Muttart Conservatory took over horticultural phone-in enquiries from the University in 1976.

(Source: unsplash.com)

University of Alberta Extension published three books by Faculty horticulture Professors that are still in in demand. They were Knowles 'Woody Ornamentals for the Prairies', Edgar Toop and Sara Williams book 'Perennials for the Prairies', and Ed's book 'Annuals for the Prairies'. Many other specialty Bulletins by them were also published by the Faculty, too many to document here, but this was clearly a major and effective extension effort and achievement for the Alberta public and industry. They were also involved in miscellaneous radio and TV programs about their specialties.

Briggs reading of the many notes by different horticulturalists of the period revealed that there was a very close linkage and an extensive and active network between everyone involved in horticulture in those times, between researchers and practitioners (including the public), between the University, teaching Colleges, Government Institutions and the private sector, and with the press, radio and TV. Although the University Professors did not run much in the way of Open Houses at their own facility, they were regular, in demand speakers and attendees at most of the major Alberta horticultural events and shows that occurred throughout the Province. Ed gave frequent talks to local gardening clubs and also developed a guide for flower shows on how to judge floral exhibits, entitled 'Exhibiting Standards for Horticultural Shows'. They were judges at Alberta and National Horticultural Shows, and for the 'Communities in Bloom' program. All three were also active members of the Western Canadian Society for Horticulture established in 1943 'to encourage research into providing hardy plant materials for the Prairies'. All three were also active members and supporters of the Alberta Horticultural Association which was run by Provincial horticulturalist Peter McCalla with whom they also had other close program ties. In support of commercial horticulture Ed and Bill were also members of the Horticultural Advisory Committee for the Alberta Government, which also included extension components.

Although the University of Alberta horticulture specialization program and all this related extension activity ended when the staff positions were lost, the commercial and public horticulture sector was able to respond to that transition by developing their own extension activities. The needs for information for market gardeners, farm market producers, and access to information about vegetable, fruit, and ornamental plants adapted to northern conditions are still well served. Many of the sector leaders who made that transition happen into the 2000's would have been graduates from the University program of the 1960's. It certainly does appear that the networks created between those individuals back then was able to survive the passage of changing circumstances, costs, budgets and time.

As an example of a private initiative helping horticultural extension this author was impressed by the information that Sheryl Normandeau assembled at her website:

http://floweryprose.com/2020/04/list-of-greenhouses-garden-centres-and-nurseries-in-alberta-2/

It lists contact information for greenhouses, garden centers and nurseries found throughout Alberta, and horticultural publications relevant to Prairie conditions in W. Canada.

5. Mr. Gabor (Gabe) Botar, University instructor/researcher, recalls Horticultural Extension at the University of Alberta

Briggs was fortunate to get input for this article from Gabor (Gabe) Botar who started work in the Plant Science Department immediately after completing his BSc in horticulture in 1978. He had already completed a BA and BEd at the University of Alberta, so was very well prepared for all the horticultural teaching that he would do in the Department. He then spent his entire career working for the University horticulture program, mainly in his role as Horticulture Field Supervisor, alongside fellow University field staff Chris Beck, Jean Hogue and Nicholas Molenaar. This was the 'boom' time for the program with typically a dozen horticulture summer students employed every year, working on multiple labor-intensive projects, the norm for horticulture students. Assessing the entire extension function over his whole career Gabe highlights two main features of this extension effort: (1) The readiness to exchange information and plant materials to all interested parties throughout the Province and beyond, and (2) The central role that the Plant Science horticulture graduates took forward through subsequent decades with their own extension activities, especially through the writing of

many extension books and other materials in demand by the public, and the senior roles of many of them in a wide array of horticulture-based enterprises and careers. Many amongst them became significant key leaders in the industry.

Gabe reported that his hobby was gardening, including a range of successes and failures in the plant breeding of many different horticultural species, coupled with a continuous search for plant introductions that would be better adapted for survival in the northern conditions of Alberta. Briggs observed that it must have been difficult for Gabe to determine at any particular time whether he was doing his day job or his hobby, as (except for the breeding work) these were the very same goals as for the Professors for whom he worked! Briggs thinks he did find an operational distinction between what Gabe did and what the Professors did. The Profs lectured, gave courses, wrote and published as their main ways of extension. Gabe also did his share of all of those but, with his team of summer student helpers, and with Chris Beck from 1978 to 1986, also did the physical work to widely make available the improved plant germplasm that was identified, sending out many hundreds of samples to local and distant horticulturalists, on request, of any selections that he and/or the Professors' programs had identified as being worth sharing. From 1990 to 2015 he actually selected, nurtured, cloned and shared the plants growing in his own garden on the University Farm at Parkland, where he lived in a University house 'right on-site' for much of his career.

Gabe actually had his own large vegetable, flower, fruits and orchard site there for his own hobby work and research, literally outside his own front door. Gabe makes reference to some of his perennial plants that can be viewed in 2022, still growing there on the now renamed 'South Campus', including peonies, butternut trees, a mini-apricot tree (its' clone now in test in the USA in 2022), a pumpkin pear, numerous other fruit trees (including unique apple varieties), and elderberries. Gabe indicated that many of the introductions that large numbers of locals came to view were accessioned from the Morden, Manitoba Horticultural Station, and in particular the columnar aspens and tall polars amongst then became locally very popular from that source, and are now commonly seen in local gardens and landscapes. Gabe estimates that he and Chris Beck had personally distributed more than a hundred different trees, shrubs, rooted cuttings and other plant materials to professional colleagues and to the public during his 25 years in the house at F64 on South campus. This was a very material and important extension activity in which the University is no longer involved since the subsequent privatization of most of the horticultural extension in Alberta, and Gabe's own retirement.

Soon after Gabe started in the Department of Plant Science the University sold part of the North end of its Parkland Farm research property to Alberta Agriculture for them to build a new Agriculture Government Centre there, in exchange for an array of modern Field Crops Research buildings that were then built at the South end of the property. The sold area had included the trees of the Department apple breeding program, but they had to be abandoned due to lack of funds to continue the program or to conserve the germplasm. An attempt to transplant cuttings from the more important apple trees of greatest germplasm value was made, but the new location proved unsuitable and most of the relocated trees did very poorly there, could not properly be maintained, or died from disease. The double loss of the apple breeding program itself, followed by the irrecoverable loss most of the germplasm collection itself, was a dark day for horticultural conservationists and for the Department of Plant Science. Fortunately, cuttings from these trees were also freely made available on request to members of the public and to the horticulture industry, so much of this collection still probably exists in Edmonton gardens and elsewhere, but in locations now unknown, and without any record of their botanical or geographical origin in most cases. Gabe's own detailed files do indicate the locations to which the University Grounds Department also transplanted some of these trees, and his records also show which of those trees are still growing where on the University properties. Some of these trees and other perennials from that location may also have made their way to the University of Alberta Botanic Garden.

Crops and Land Resource Unit, completed in 1981, South Campus, University of Alberta

After Professors Knowles, Toop and Andrew retired Dr. Rick Knowles was appointed as the replacement for Professor Andrew and worked mainly on the physiology of potatoes (particularly on tuber ageing) and on Saskatoons, but discontinued the potato field trials. His extension activities were mostly limited to direct interactions with the potato production industry in S. Alberta. Rick left in 1999 for a Professorship in the Department of Horticulture at Washington State University but had spent some time overlapped with Dr. Jocelyn Ozga who has subsequently worked mainly on physiological aspects of the production of field peas, Saskatoons and Honeyberries. During that period Gabe Biotar also continued working both as a technologist and with their graduate students.

Two community - oriented extension projects were started in the 2000's at the South Campus, run by University student and public volunteers, both with the overall objective of better familiarizing the urban Edmonton public with the source of their food, and to provide an opportunity for them to personally grow plants and food. The first of these is the Green and Gold Community Garden ('A local garden with global impact'), started in 2009, where volunteers grow and sell organically grown garden produce whilst gaining experience in gardening, and socializing in an outdoor setting. This project is located adjacent to 'Gabe's garden', although he no longer lives at that location, and it takes advantage of some of the perennials that were a legacy from his effort. A special feature of this project is that all produce is sold to raise funds in support of the Rwandan Tubahumurize Handicrafts Project, whose handmade crafts are also sold at this location. The garden has raised over $435,000 since its' inception in 2009. Contact: https://greengoldgarden.com

(Source: Website Green and Gold Community gardens)

The second volunteer project is the 'ALES Prairie Urban Farm'. This is a 1 acre, mixed crop, community food system also located on South Campus and run by volunteers. Its' primary purpose is 'to demonstrate and provide skill-building opportunities in urban agriculture and climate resiliency'. Participants 'gain hands-on skills, propagate local knowledge and take part in important climate and agricultural research'. More details are available at http://prairieurbanfarm.ca

ALES Prairie Urban Farm: Volunteers grow crops for demonstration and food, then give it away to the needy

(Source: ALES Prairie Urban Farm website)

Part 3C: The extension and other roles of the University of Alberta Botanic Garden (UABG)

A very abbreviated description of what the University of Alberta Botanic Garden does in extension might read something like the following, one which is based as an outsider on this authors' experiences and readings about the UABG:

'We do research, grow and conserve native and domesticated horticultural and other amenity plants of interest to Canadians, with an emphasis on their adaptability to northerly climates. We also provide educational and other opportunities for the local Alberta public to view, enjoy and learn more about those plants in a garden amd natural landscape setting'.

Likely the better, shorter description is the one given by the UABG staff on their own website, which reads as follows:

"We grow plants to connect people with the earth so that they cherish the essence of life"

1. A Brief History about the University of Alberta Botanic Garden

The 95 hectare University of Alberta Botanic Garden (UABG) was originally established in 1959 on land donated for use as a 'Botanic Garden and Field Laboratory' of the Department of Botany in the Faculty of Science. The managed garden area is about 30 hectares, the remainder being natural areas never cleared or cultivated, but now including some drainage canals, ponds and natural wetland zones. In the 1970's the property was substantially upgraded with funds that a volunteer group provided, the 'Friends of the Devonian Botanic Garden', a group name reflecting the 1970's operational name of the Garden at that time. The 'Friends' continue to provide valuable volunteer assistance with fundraising and with the physical upkeep, and many programs and activities that continue under the new University of Alberta Botanic Garden (UABG) name designated in 1971.

For several years the administrative home for the UABG was transferred to the Faculty of Agricultural, Life and Environmental Sciences. In 2022 it now operates independently reporting to the Support and Recreational Services of the University of Alberta Division of Facilities and Operations.

2. What are some well-known activities and roles at the University of Alberta Botanic Garden?

Details about the garden and its activities can be read at the URL: https://www.botanicgarden.ualberta.ca/ from which much of the following information is drawn.

The University of Alberta Botanic Garden is the largest botanic garden in Alberta and is well known for its role in collecting and maintaining a diversity of plant species, 'with emphasis on cold-hardy plants that can survive harsh extremes of the Canadian Plant Hardiness Zone 3 climate' (see Part 3B for an Alberta map of the Zones). As a University facility it is also a site for plant adaptation research about native species, plant diversity and conservation. It also maintains unique collections of alpine and local native species, maintains a Native People's Garden, and also features aboriginal medicinal plant species. New facilities for public and University use are continually being added, and include a fully digitized herbarium, with a large Bryophyte collection, and many horticultural species of interest both to the public, the horticultural industry and to researchers.

Of special note at the Garden is the unique Aga Khan Garden funded by the Aga Khan IV, finished in 2022 with the addition of a pavilion. It is the Northernmost Islamic Garden that exists in the world, was completed at a cost of $25m, and is now a singular tourist and local attraction in the central Alberta region. The Kurimoto Japanese Garden is also another distinctive feature which visitors enjoy at the Garden.

A few scenes to be found at the University of Alberta Botanic Garden (Source: UABG website)

Flowers

Garden Features

Aga Khan Garden

Kurimoto Japanese Garden

The University of Alberta Botanic Garden Collections

The University Botanic Garden has very many viewable plantings in outdoor locations, for all of the different plant collections listed pictorially below, as well as for additional Temperate, Tropical and Arid Showcases in greenhouses (even including live butterflies!)

(NB: The images that follow are not from the UABG but were sourced by Briggs from the web with acknowledgement to unsplash.com, with individual credits indicated)

Annuals and Perennials

(Source: yue su)

Fruits and Vegetables

(Source: alexander schimmeck)

Herbs and Sensory Gardens

(Source: sixteen miles out)

Lilacs

(Source: Karo K)

Lilies

(Source: Chris Barbalis)

Peonies

(Source: Teo Zak)

Primula

(Source: C. Chaurasia)

Roses

(Source: Aida Batres)

Trees and Shrubs

(By: ash from modern afflatus)

Trial Gardens

(Source: Keith Briggs)

The Botanic Garden is not only a place about plants but also is a place where you can purchase them. It is an educational center, with classrooms for teaching arts, crafts and other subjects, has a Patio Café concessions area, and is a frequent destination for group gatherings, celebrations, birthday parties, weddings, and other public functions. It is also a favored destination just for an easily accessible family day out in the country, just a short drive from Edmonton.

Carl Charest, the 2022 General Manager of the University of Alberta Botanic Garden, has pointed out that even during the early days of the Covid outbreak (the early 2020's) 'the Garden was a place of refuge, a place to get away for a few hours, relax, rejuvenate and enjoy life, safely'. Even in the first year of the epidemic the garden had 115,000 visitors without even a single on-site case of Covid being reported.

This author and his family have been longtime fans of and frequent visitors to the UABG over the years. The Garden is included in this story because of its major extension role in providing a place where Alberta residents can not only enjoy the pleasure to be realized in gardens of all kinds, especially this one, but can also learn more about the plants that interest them. As an example of that, for several years Briggs' grains crops research program partnered with UABG to grow small plots of annual Alberta grain crops at the Garden so that city dwellers could learn more about the farm crop species and origins of some of their daily food staples. Also, the Faculty of ALES has in the past often used the location for some of its own special celebratory events. It is a very special University place where anyone and everyone can relax and, literally, 'Slow down, and take time to smell the roses!'

As mentioned before, and as the UABG staff say on their website:

"We grow plants to connect people with the earth so that they cherish the essence of life"

DO GO THERE…..AND SUPPORT YOUR LOCAL UNIVERSITY BOTANIC GARDEN !

Author's end notes:

This author learned much when researching detail for this story, especially from the other contributors to the different sections. I hope that you, the reader, found some of it interesting, and that you might choose to share its' content with friends.

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Please scroll down…Thank you!

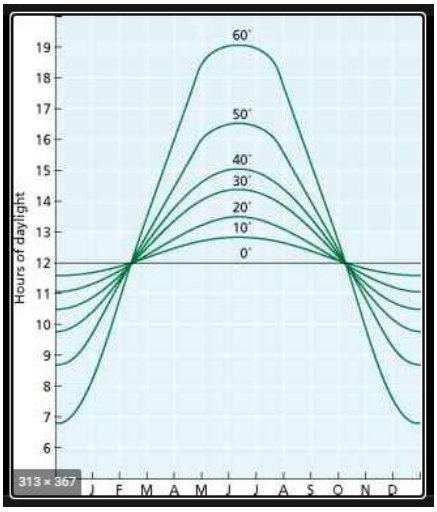
Appendix 1: Some observations about the agro-ecological variability found in Alberta that affects agricultural crop production

Agricultural crops are grown in Alberta under a very much wider range of agro-ecological conditions than are found in the other two Prairie Provinces of Saskatchewan and Manitoba. In Alberta, grain and forage crops are grown from the 49th parallel at the USDA border all the way North to Fort Vermilion near the 58th parallel, at very variable altitudes, from the Eastern Alberta Prairies into the Rocky Mountain foothills, on land of very many different soil types, characteristics and suitability, and under very variable annual, crop seasonal, localized rainfall conditions and temperatures, and variable snow cover in winter. In mid cropping season (June / July) daylengths can vary up to 3.5 hours per day from North to South, and the received heat units and sunshine hours can also vary greatly in these northerly locations throughout Alberta. Both altitude and local topography, such as a North vs South facing slope, can also make a very great difference in the sequential and cumulative local microclimatic conditions that occur during plant growth and development in individual crop production fields in Northerly locations. Of very great importance in Alberta is the limitation to crop and variety adaptation that occurs because of the relatively short frost-free growing season, compared to most global crop agricultural regions, the length of which is reduced even more in higher altitudes nearer the Rocky Mountains, as well as in the most northerly parts of the Province. Central Alberta also experiences one of the highest risks of crop damage by hail of any major crop agricultural production region worldwide, and a consequent high usage of crop insurance to cope with that constant risk.

The combined overlay of all of these variables creates a myriad of agro-climatic variation throughout the Province that affects not only the general adaptability of the individual crop species that can be reliably grown, but also the productivity cropping successes (or failures) of the individual variety choices that are made for individual fields. This variation in conditions also affects the occurrence of and success or failures of the many different diseases and insects that can negatively affect crop agricultural and horticultural outcomes.

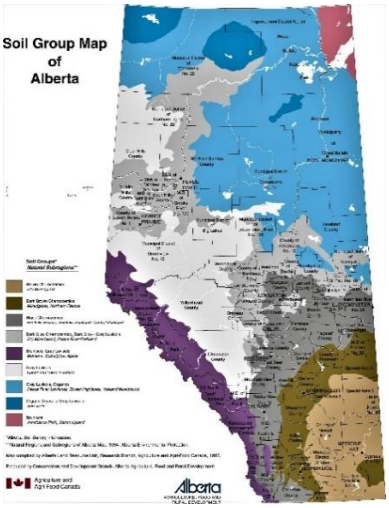
As growers make their crop, variety and management choices for each season and field they have to rely on past experience and ‘averaged’ descriptions about what the growing conditions might be going forward, and about the best crop and variety choices that might best fit their expectations. This has become much harder to do now that climate change is producing a greatly increased frequency of extreme and unpredictable conditions for plant growth, and extreme local weather conditions that can hinder crop production. From a variety choice point of view this might suggest that choosing (and breeding) varieties with better adaptation to more variable conditions may be a better prospect in the future for many of the Alberta production areas, but, then again, who is it that can predict conditions in the next cropping season? ‘Averages from the past’ are all that there is that is available, and those averages do help, but may become increasingly less reliable with even further climate change. Who knows for sure? Reliable Alberta data from continuing grain crop Regional Variety Trials continues to be a vital tool for making grower decisions.

Alberta Hours of Daylight
(Source: Open/ European.medical)



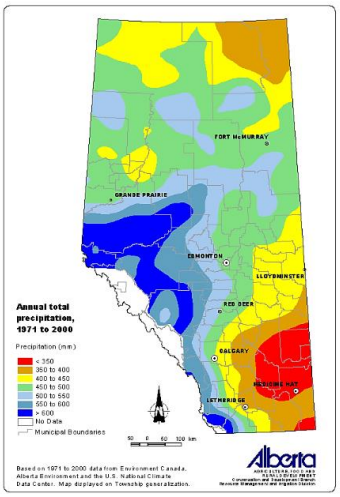
Lethbridge (49^{0}N) vs Ft. Vermilion (58^{0}N)

Alberta Soil Groups
(Source: open.alberta.ca)



Variable soil types in Alberta

Alberta Annual Rainfall
(Source: open.alberta.ca)

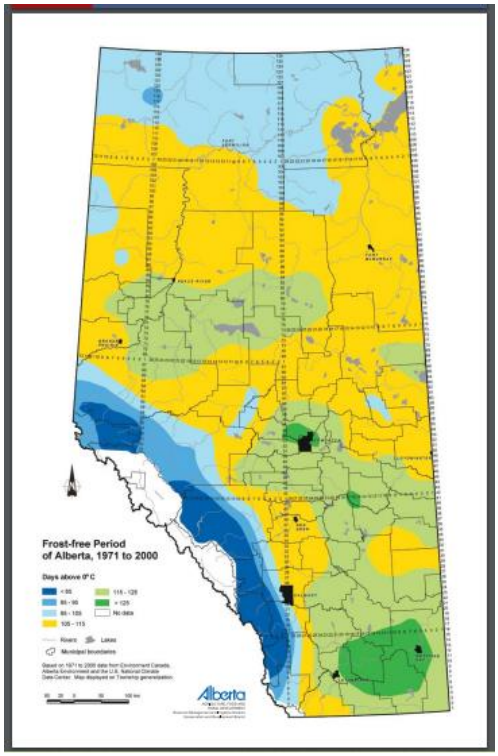


SE Alberta: Drier, hotter, longer season

Graphics are shown here for a few of the important components of that 'average' variability found in Alberta, not for the detail, but to emphasize the extent of the already known 'built-in' agro-ecological variability that growers in Alberta have to plan for ahead of each crop season. Regional variety testing and 'best possible' variety data descriptions certainly do help growers in their choice of varieties that can best fit the conditions that they try to forecast for each of their fields.

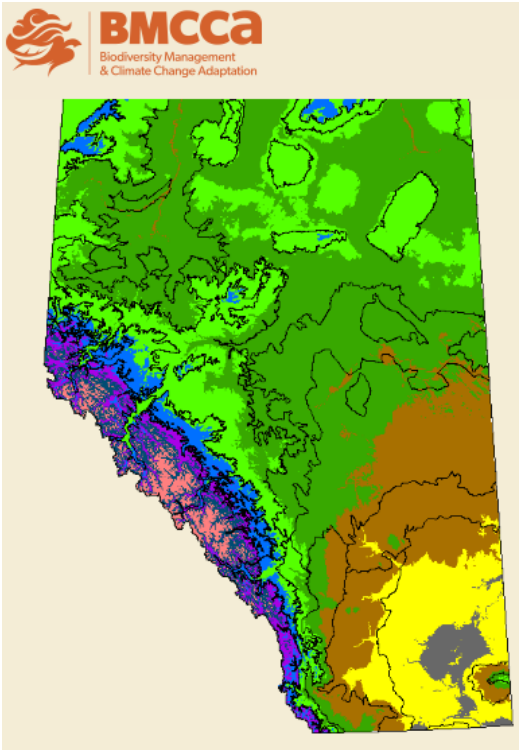
Alberta Frost-Free Season Length, days (FFSL)

(Source: Open / alberta.agric.ab.ca)



Alberta Historical Season-long Degree-Days (SDD)

(Source: BMCCA website: www.abmi.ca)



Both frost-free days and cumulated degree-days (heat units) are longer in SE Alberta, and generally diminish towards the North, and towards the Rocky Mountains. Local topography can also affect heat unit accumulation and microclimates considerably. They can do so either more and less favorably for both frost risk and heat unit accumulation, but significant local, temporal and annual variations in these are found scattered around everywhere, a few even visible on these large-scale graphics.

Daylength (photoperiod) effects are also known to significantly affect many plant species, are under genetic control, and are known to affect also affect how individual crops and varieties can be differentially better suited to conditions in the Northerly vs the Southerly parts of the Province. In mid-summer there is a 3.5 hour difference in daylength between the North and the South of Alberta, as indicated in the first of the five graphics graphics, but plant scientists do not yet understand how or whether that amount of difference could be an important factor in breeding varieties adapted to different parts of the Province. There is very much science yet to be learned about how regional adaptation of crop varieties is controlled and might be even better exploited in variety breeding programs.

<u>Addendum and FYI, Just for the Record: Alberta Horticulture Stations changed their names many times:</u>

At Brooks: 1935 -1970 Provincial Horticultural Station; LATER Alberta Horticultural Research Station;
LATER Alberta Special Crops and Horticultural Research Center; LATER Crop Diversification Center South

At Oliver (NE Edmonton): Provincial Tree nursery; LATER Alberta Tree Nursery and Horticultural Center;
LATER Crop Diversification Center North
