Cereals, Grass and Opinion

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For the growing year Fall 2007 to Fall 2008
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The cool and damp spring provided excellent conditions for planting cereal grains on southern Vancouver Island this year. There were, although, some issues for lowland farmers getting on the land in a timely fashion. This year's large trials included the following varieties, CDC Baler spring oats, CDC Cowboy spring barley, and AC Ranger Spring barley, all of which are intended for silage production but which also delivered good crops of harvestable feed grains. Additionally, AC Gwen, a hulless oat, Golden 86 hard white spring wheat, and CDC McGwire, a hulless barley were seeded for human consumption. All varieties were seeded on May 21 into chisel ploughed, disked, and harrowed land. The Haybuster drill was used to seed a small amount of starter fertilizer and the intent was not to fertilize further because significant rain was not, and is usually not, forecast for this time of year. Irrigation was not used so that normal climatic conditions could be better assessed with regards to yield and protein. These points were born out as expected with both yield and protein levels down compared to last year because plants were under drought stress fairly soon into the growing season. The dry summer which followed, resulted in very little if any disease issues like the previous year. There are no useful recommendations with regards to disease and all varieties will have to be grown out again during higher disease years to ascertain their true resistance capability.

Mini trials conducted on the home front included an additional nine varieties of UK spring malting barley, six varieties of Oregon winter 6 row malting barley, two UK winter malting barleys, and 9 varieties of hard red spring wheat. Additionally, Tom Henry grew 2 modern varieties, AC Harvest and CDC Go hard red spring which both proved to be successful. Significant wireworm issues surfaced in several fields taken out of pasture, and a wipe out occurred on a 10 acre red fife plot in the Cowichan area.

Winter 6 row on December 25 2007, seeded November 8th

A successful trial of Copeland spring barley was harvested at Gerald Pohlmans at the soft dough stage for round bale silage and is proving to be a cattle favourite. In principle, if land is available, and farmers could manage milking and grazing a few more, but lower producing cows (for life span and other health related issues), a diet lower in energy such as cereal silage is much more carbon neutral and water thrifty than corn. That being said, there are definitely locations on the island that corn could be included in the forage chain. Interested farmers should consider the new male sterile varieties coming out of the US for use in non grain grazing and conserving. Additionally varieties of corn with higher heat requirements (personal correspondence from Gerry McClintock) may stay vegetative longer and provide excellent grazing into the fall.

The Weather this year:

The weather was cool and moist with excellent planting possibilities on higher ground. Conversely, the lower lands stayed wetter longer with low evapotranspiration so that seeding of some barley acres was delayed until early June. Spring planting of wheat and oats in Metchosin and the Saanich Peninsula commenced in early April. The wheat seeding seemed to idle along, and as usual, sustained worrying goose damage. Precipitation was lower than normal in the early spring and this allowed farmers onto the higher land sooner then normal. Rain for June and July amounted to 38 mm and was within the norm of 20 to 60 mm for that period. The Average mean temperature for June and July was 15.2 C which is low compared to the average of 16.5 to 17 observed from 2000 to 2008. These figures are of importance to the grain grower as it provides for analysis in determining timing of seeding and fertility rates for desired protein and yield outcomes. Organic growers must manage their cover crop incorporations or compost and manure applications very carefully with an eye to the weather in both the fall and spring to promote the desired outcome for protein levels and to prevent lodging. Lodging is more of an issue on the coast than the prairies because the damp weather will rot the lying down (or swathed) crop.

Winter barley and early seeded oats were harvested in good condition during the second week of July. Harvest continued until the beginning of September with low land barley coming in last (middle/late September) at approximately 20 % moisture. This is too high for unventilated storage. Good weather this September could have allowed for dry down in bins using ambient air and a strong fan.

Fall planting weather temperatures were good but a lack of rain (quite common) prevented even germination in crops that were notill seeded into marginal clay soils between August 28th and September 24th.

Fall Seeding:

It is critical to seed fall crops early to take advantage of usual small rains we get during the last 2 weeks in August and the first week in September.

Fall seeded true winter cereals

winter wheat, winter barley, winter oats, fall rye, winter triticale.

Seeding of true winter cereals for grain production can start on August 22nd and should be finished by September 15th. The seed can sit in the ground waiting for rain or may be irrigated any time to get germination started. Irrigation must commence by the 15th of September if there has been no significant rain, one inch will do if not seeded too deeply. This amount of precipitation should carry the crop through till the end of October if dry conditions prevail. Using to much nitrogen at seeding will promote disease and excessive growth. Planting winter cereals later than September 20th will result in straggly plants and very slow growth as observed in many gardens and fields. Seeding earlier will result in plants that grow too tall, and unless grazed down, are subject to excessive lodging, disease, and compression by snow and rain.

Goose control is also critical at this point as grazing will stimulate more tillers which may not be desirable. Extra tillers will not have the same stalk strength and may also result in smaller kernels, uneven maturity and delayed harvest. Yields may increase as long as lodging due to the increased mass does not result. Lodging may also cause the crop to be downgraded to feed depending on the weather and disease pressure.

I have seeded winter barley as late as the first week in November but this is not usually possible except on high well-drained ground. I have also seeded winter barley as late as the first week in February and it appears that there were still enough vernalization signals to harvest a seed crop. Many UK winter cereal varieties have a latest planting date, after which the plants will no longer set seed. This will vary within the species, and also with other grains. On southern Vancouver Island some warm days in January and February. will bring sporadic growth as is true for several grass species.

The key to getting a good winter cereal fall cover crop for feed or mulching is planting early, (otherwise seed spring cereals) on or about August 01 until August 26th. Winter cereals will go dormant and not add more mass once the day length shortens strongly. If seeding late into September, and the only option is winter cereals (eg fall rye), high seeding rates are recommended. One could easily double the normal rate to get any sort of weed control or proper ground cover. This double rate seeding technique is also used by organic grain growers around the perimeter of fields because it does a good job of stopping weed ingress from surrounding fields.

Fall seeded true spring cereals

spring barley, spring wheat, spring oats, spring triticale and spring rye (rare crop)

Spring oats, wheat, and barley seeded from August 15th to the 30th were almost two feet high (Zadoks 34) by the end of September, and were suitable for grazing well into November (watch for nitrates if frost and high N applications). Even if irrigation is necessary, a significant crop for fall and late fall grazing or silage is possible around these planting dates. Earlier seeding might allow for double cropping as grazed off plants will over winter and be harvestable as grain (much lower yields though) the following spring.

Spring oats seeded Aug 20th 2008

If it is not possible to seed early for cover cropping or silage, spring cereals are a better bet than winter cereals for middle/late September and October seeding. Spring grains are programmed to grow quickly and form a seed head to complete their life cycle. This provides for faster ground cover, increased erosion protection, and weed control.

Some varieties of spring cereals seeded in the fall and intended for grain will over winter well, others will be strongly affected by both cold and disease. Very few will be killed outright by our typical winter conditions**. It is advised to seed spring varieties intended for grain** from Sept 20th to Oct 05 to prevent excess top growth and the resultant lodging and rotting.

Spring seeding:

Spring seeding of spring cereals can proceed from February until the end of May, as germination occurs at temperatures as low as 4^{o} C. Seeding later is cause for concern as the crop will generally not make maturity and dryness targets (especially wheat). Harvest may commence in early June and continue through to mid September depending on the type of grain grown and the weather conditions. First to ripen is barley, then oats, and lastly, wheat and triticale. In order to achieve malting quality and low proteins, barley should be planted early. Longer season wheat for human consumption should also be planted early to ensure sufficient ripening time, although this may reduce protein levels because there will usually be sufficient moisture (see water and irrigation table). Feed grain varieties can be planted at other available time slots as their quality is not as critical.

Seeding deep into moisture is risky on clay soils because a top layer crust forms during dry days and the seedling dies because it cannot penetrate this crust. Seeding deeper into other soil types with even and gentle packing will work, and might be a necessity on lower wetter lands, as late seeding may not have the required rainfall every year for successful germination

Winter cereals may be seeded in the spring or summer. They will remain vegetative but not perish if there is enough soil moisture and the roots are able to go deep. They will not produce much volume of forage but it will be sufficient for decent ground cover. These seedings will over-winter normally and produce good growth and mature the following spring.

Facultative cereals:

Many grain varieties are a combination of winter and spring breeding. They will over winter well, but do not require a vernalization period. This is a bit of uncharted territory on the coast, but I suspect that they will do well in both spring and fall plantings.

General seeding dates for south coastal Vancouver Island

True spring varieties *end use*	**spring seeding**	**fall seeding**
silage/graze/hay/covercrop	Feb 15 to June 15	Aug 01 to October 15
grain	Feb 15 to May 15	Sept 20 to Oct 05
True winter varieties *end use*	**spring seeding**	**fall seeding**
silage/graze/covercrop		Aug 01 to Aug 26
grain		Aug 22 to Sept 15

Disease:

The top three observed diseases are scald (incorrectly identified as blotch in the last report), stripe rust, and powdery mildew. When looking for varieties to plant it would be very helpful to find those which have some bred-in resistance. Looking for these qualities can be quite the task as many countries, states, and bioregions have breeding programs tailored to their specific disease pressures. Generally the prairie Provinces do not breed for coastal diseases. Mutation of several diseases (rusts and fusarium) has also led to varieties becoming ineffective against the diseases they were bred to resist.

Scald pressure on winter barley

Good crop rotation practices, as well as soil that is alive and teaming with bacteria and fungi from proper remineralization of the soil with organic matter and minerals, will go a long way to ensuring plant health. Over use of chemicals and spray will ensure the continuation of a downward plant health cycle. Healthy plants in good soil will be able to protect themselves from microscopic invaders (see article in Acres USA by Bruce Tainio “managing by plant tissue PH”).

On any given year with average climatic conditions, **scald** is the disease which most affects both spring and winter grains. This disease has been present in up to 80% of all the cereal crop varieties I’ve grown, and has significantly reduced yields. Both powdery mildew and stripe rust are less of a general concern, but appear to be more prevalent in wet summers. Reusing seed from infected plants is not advisable as re-infection may occur.

Even with crop rotation, the possibility of fusarium infection (DON) is always looming and has been newly observed in areas west of the Cascades in the USA. It could conceivably become a major issue in the future. Growers should be vigilant about testing their seed (either purchased or saved), with certified seed labs in Alberta. Any marginal looking crops for human and animal consumption should also be tested.

If wireworms are present in manageable numbers, use higher seeding rates and/or treated seed. If heavily infested, land should be left fallow for up to three years to starve out the offenders. Wireworms like to chew the coleoptile just above the seed. Once the chewing has taken place, other root and soil pathogens enter the plant and may also kill it. When the plant has developed crown roots and no longer relies on seminal roots, it stands a better chance of surviving. It is imperative to seed evenly and not deeper than one inch so that the plants will germinate, sprout, and grow quickly.

Water and Fertility:

Sufficient water and timing of availability will affect both the yield and the protein levels in most cereals (Some varieties are very predisposed towards high or low protein regardless of conditions).

Table for average Saanichton BC spring conditions.

water and fertility table using normal seeding rates

	feb mar early april	feb mar early april	feb mar early april	april may	april may	april may	april may june	april may june	april may june
available water	high	high	high	med	med	med	low	low	low
fertility	high	med	low	high	med	low	high	med	low
protein	M - H	M	L	M - H	M	M	H	M - H	L - M
yield	H	M	L	H	M	L	L - M	L - M	L
concerns	lodging	lodging		lodging			Weed control isues	Weed control isues	
Kernel size	H	M - H	M - L	H	M	L - M	M-L	L	L

Available water can be in the form of rain, irrigation, and soil moisture, while timing of seeding, the availability of nutrients and water are key in achieving desired protein levels

The early availability of nitrogen will also generate more tillers if targeted plant breeding allows this, (some are bred to keep tillers at a minimum so that the kernels will always be larger). This will also promote lush vegetative growth. If nitrogen is available later on, it will be used increasingly by the plant to raise protein levels in the seed. Split applications of N are the norm for high yielding high protein crops if one is in a position to time irrigation, or if weather patterns normally allow for this.

Nitrogen from manure or plow down cover crops will be released more slowly over a longer period of time and it may be difficult to keep the protein levels down (for malt) if there is not sufficient moisture. Conversely, protein in wheat may increase under these circumstances. If weather conditions for growth are good (cool and damp) lodging might result as N is continually delivered to the plant. Soil and tissue testing, application of organic matter, and unlocking the minerals (calcium and phosphorus especially) bound up in clay soils are important tools in maximizing plant health and yield, while minimizing the use of fertilizer and pesticides.

Issues to be investigated are fungal seed inoculants such as Jumpstart, from Novozymes. These create symbiotic plant root fungi relationships and theoretically scavenge bound phosphorus from clay soils. It appears that only some of the applied P is being used by the plants and some is seemingly being lost every year while actually building up in the soil.

Mini Trials of barley and wheat seeded fall 2007:

Pearl winter barley surrounded by fall seeded spring barley which had been mowed but still produced a seed head

The following varieties were seeded in small plots:

Spring malting barley from the UK include the previously spring seeded varieties Decanter, Oxbridge, Appaloosa, Troon, Westminster, and the winter variety Pearl. All were seeded on September 13th 2007 and only Pearl was harvested on July 9th 2008. . Pearl did get a flag-leaf collar disease which was not devastating, but should be reckoned with in future plantings. None of the spring barley varieties survived very well and were stricken with severe scald infections.

Additionally, six Oregon state 6 row winter malting barley varieties, OR71, OR72, OR73, OR74, OR76 and OR77, from Pat Hayes' barley program were seeded on November 8th and were well emerged by December 5th. This was very late, but still successful , as harvest of these varieties was only 2 weeks later then Pearl.

The six Oregon 6 row winter malt barleys performed well, and larger amounts of OR71,73,74,76 were imported for larger plot evaluations. All had low levels of mildew, some better straw strength, and others, better brewing qualities. With some fine tuning the potential for these varieties to produce a truly northwest generated malting barley is very exciting. Dr. Hayes has also agreed to keep an eye out for varieties which may pop out from his hundreds of breeding lines that would normally be discarded, but which may have characteristics and disease resistance more suited to coastal growing conditions. Their only drawback may be conditions he is breeding for in the Pacific Northwest interior where cold temperature resistance is much more important than on the coast. Included in the 2008/2009 winter trials are some hooded forage/hay barleys and a hulless winter barley also courtesy of Dr. Hayes.

Flagon UK winter barley was seeded on February 6th 2008 and was showing by March 1st. Harvest of Flagon was 10 days later than the Oregon varieties.

Pearl, and Flagon were strong performers and are recommended for malting at this time. Most importantly, the maturity date for Pearl was two weeks earlier than an older winter type I have been using. This resulted in a most favorable harvest window.
(see CMBTC barley analysis for the good numbers)

Four white spring wheats (previously seeded and noted in the spring of 2007) from Sharon Rempels collection. Big Club, White Federation, Bishop, and Allen, as well as the winter emmer, all performed very poorly with excessive stripe rust, scald, winter kill, and lodging.

Main trials of wheat, oats and barley spring 2008:

Approximately ½ acre of the following spring cereal crops were grown this year.
CDC Baler spring silage oats, CDC Cowboy spring silage barley and AC Ranger Spring silage barley, AC Gwen hulless oat, Golden 86 hard white spring wheat, and CDC McGwire hulless barley

Seeding was completed fairly late on May 21, largely due to wet conditions on low lands from the cool spring. No burn off was used this year as the grass weeds had largely been taken care of the previous year. There was an in crop application of Buctril M for broadleaf weeds targeting scentless chamomile most specifically. Because of low fertility, low moisture, and uneven seed depth (better than last year) the crops, and especially the wheat, were not very competitive. For good and fast cover, barley should be the first planting choice, then oats, and lastly wheat. Soil tilth was improved this year as much of the straw and residue were incorporated in a fall disking operation. The following crop will be pumpkins and it is anticipated that the last 2 years of grain will have mellowed the soil for that purpose. Because the weather was dry, only the two feed barleys had noticeable scald, while the oats, wheat, and hulless barley were minimally affected. Interestingly, some volunteer wheat in the hulless barley patch had significant amounts of stripe rust while the barley around it stayed clean. The geese arrived back to harvest a little of their own grain but did not return after two were dispatched for the dinner table. **They did however; prefer the awnless wheat over the bearded**, which may be helpful in future varietal planting decisions. The deer also seemed to prefer the awnless wheat but not much stopped the critters while the plants were small and succulent. This year, a disked strip of land between varieties provided an excellent runway for geese. Bare wireworm infested patches created nice holes in the middle of some areas and became additional starting out points for goose grazing. It is important to keep as much of the field covered in tall crop as possible (hard to fly in and out of) and not allowing the formation of a breach point.

Overall the crop was light at the early milk stage, and because the field was not rolled after seeding, mowing and silaging on those varieties were attempted, and then abandoned because of uneven ground and the possibility of bringing up dirt into the silage. The three silage varieties were instead, harvested as grain, and will be reseeded in spring 2009 on larger silage trial plots at Gerald Pohlmans in Cowichan. Overall seed plumpness was down and this was particularly evident with the hulless oats. The hulless oats will also be reseeded because their agronomic attributes were good, and their high digestibility and amino acid profile for use in young hog and poultry rations well documented in various trials. Combining these oats was difficult as many grains did not thresh out. This is fine for feed rations, but without sophisticated cleaning equipment, it is very difficult to achieve food grade quality for milling. The wheat faired well, although protein levels of about 11% were much lower than 12.6% in 2007.

The standout among the group was the McGwire hulless barley which produced a great crop of low protein barley for malting purposes. The barley was pilot malted and brewed. The analysis from the CMBTC indicates high levels of beta Glucans (BG), which are generally not good for brewing. However, additional time on the germination floor would have further reduced these. A BG rest during the mashing process will also further reduce the BGs. Sugar (maltose) extracted during brewing was high, and the resulting beer very smooth with low tannins and astringency levels, much like Japanese brews. There are new low BG varieties coming down the breeding pipeline and these will be trialed when seed is available. High levels of BG are excellent for human health and when hulless barley is used for grinding, sprouting, and baking, the nutritional benefits are similar to oats. There are also varieties of hulless barley which are being grown more specifically for human or animal nutrition and, depending on your end use needs, have additional properties which make them more desirable than McGwire.

All crops were harvested in sound, dry condition during the first and second week of September while the continuation of good weather reduced the average risk for harvesting at this late date. Many years are not that good. Another patch of barley seeded 1.5 weeks later on the neighbouring lowest land did not dry down enough due to moisture reserves in the deep soil. It is still advised to swath these crops, or if so inclined, apply some pre-harvest round-up.

Re-using seed from a preharvest burndown will generally result in reduced germination of said seed, and therefore cannot be used for malting. Harvesting at higher moistures is possible if bin aeration or drying is available, and many malt growers do harvest at higher moisture levels to prevent grain cracking and embryo damage during combining. A properly set up combine with good concaves, rasp bars, and reduced cylinder speed, are critical in achieving this.

Aphids were prevalent again this year and this was a bit worrisome until the lady bugs arrived albeit later than usual. It is also recommended that late seeding be done on south facing fields as anything north, north sloping, or behind a large stand of trees, will cause ripening and harvest to be delayed. The sun is already dipping low to the south at this time of year.

Mini Trials of barley and wheat seeded spring 2008:

Nine UK spring malting barleys varieties from New Farm Crops (Syngenta), Optic, Publican, Cocktail,(all low GN producers and suitable for distilling) Quench, Pewter, Tipple, Braemar, Cellar, and Christalia (all suited for brewing), were seeded on April 30th The old variety Optic had the most disease issues while all others faired very well. Larger plots of all these will be grown out again in Spring 2009 to coax out further yield and agronomic data. At this point, all these varieties are recommended for malt as long as they are seeded early. (see table)

Spring seeded spring wheat and barley on left, winter barley on far right edge

From Sharon Rempel's and Walter Walchuck's collections, the following hard red spring varieties were seeded on April 30th . Pollard, QW628, AC Brio, Keremeos Red Fife, Early Red Fife, Calcutta, Lofthouse, Red Bob, Stanley, Park, Saunders, Cerebs. The three wheat's from Ontario, Pollard, QW, and AC Brio, were the standouts of these older varieties. Both the Cerebs and the Saunders seeds were much lighter in colour, and may not be hard red spring. The Early Red Fife had less agronomic issues then the Keremeos Red Fife, while the kernels from AC Brio, and early Red Fife were bold with a strong red hue. The QW seed was also very bold and red, but more elongated like durum or kamut, a very attractive grain. Protein amongst these varieties was high, as nutrition was sufficient and moisture limited. Seed is also rated (by me) for its ability to stay encapsulated by the husk. Any sign of splitting and exposing of the seed to the elements could mean downgraded quality. Potentially, this is a genetic function but also a statement of soil nutrients, moisture availability, and timing, in maintaining a supple plant.

Given their stronger performance, great big flag leaves, and apparently coast friendly disease packages, more trials of Ontario varieties, both spring and winter, red and white, should be considered for future testing. It is very important to get disease free (fusarium) seed.

Seeding of grass varieties fall 2008

Three varieties of perennial grasses, Barliza Timothy, Hykor Festulolium, and Johnstone Tall Fescue were seeded with a starter fertilizer into well prepared soil to assess their winter growth habits. The timothy is sold as a grazing variety, and unlike other timothy's, will not be readily killed off with repeated mowing before the seed head has emerged. The timothy was, as expected, slow to germinate, not showing much growth but covering the ground sufficiently from an August 28th planting. Seeding much later than this on south coastal Vancouver Island will not provide for sufficient ground cover going into the winter and as always, precise seeding depth, proper packing, and instant moisture go a long way in getting a vigorous stand. Both the Hykor and Johnstone were very vigorous germinators and grew up to 12 inches, whereas winter peas interseeded with the grasses grew up to 8 inches. The plants were anchored well enough that grazing by cows was possible without worry of being ripped out. All grasses were partially mowed in early October to mimic grazing and this proved to be beneficial later as the snow flattened everything. The assessment of spring growth will be determined after this report is finalized, but I will endeavor to update interested farmers at a later date.

Timothy on far left, Hykor middle, Johnstone right (lone volunteer winter barley on far left has 10 tillers due to lack of competition. This function of yield is somewhat self regulating as the plant will assess moisture and fertility levels in the fall and send out as many tillers as it thinks it can sustain given that information)

Prine Annual rye grass was over-seeded on a marginal pasture in late March, the subsequent cold and very wet fields resulted in no germination or growth and was clearly seeded too early for the conditions this spring.

Investigating newer lines, such as Tekapo orchard grass, which are more vegetative than other orchard grasses on the market, seem well suited to grazing and could have a place in these types of operations. There are now also LAH (low aftermath heading) perennial rye grass varieties available which perform more like orchard grass after the first cut.

This table illustrates the differing seed sizes of the malting barley varieties, and was used as part of the criteria for determining the recommendability for malt production. Many spring varieties had more thins than is desirable, but this was due to low moisture availability in light soils. In North America, sizes are measured in 64^{ths}, in Europe, they are measured in millimeters. The percentage shown for each category is the amount of seed that is held on the screen of that size, except for the last number, which is the amount that goes through the smallest screen (in this case 5 ¾)

	Rows	6R	6R	6R	6R	6R	6R	2R	2R	2R	2R	2R	2R	2R	2R	2R	2R	2R	**standards for malt**		
		Winter								**Spring**									**USA/CND**		**UK**
64ths	**mm**	OR 71	OR 72	OR 73	OR 74	OR 76	OR 77	Flagon	Pearl	Optic	braemar	cellar	crystalia	publican	cocktail	pewter	quench	tipple	**2 row**	**6 row**	**2 row**
7	2.78	64%	46%	54%	40%	45%	36%	64%	83%	70%	99%	43%	82%	67%	51%	77%	76%	89%	60%		
6 1/4	2.38	21%	19%	33%	38%	29%	36%	23%	12%	26%	1%	41%	15%	29%	33%	17%	20%	9%			
5 3/4	2.28	8%	14%	9%	13%	13%	15%	6%	3%	3%	0%	12%	2%	3%	10%	4%	3%	1%	40%		
thru		6%	21%	4%	8%	13%	14%	7%	2%	1%	0%	4%	1%	1%	5%	1%	1%	1%			
6 1/4 to 7		85%	65%	87%	79%	73%	71%	86%	95%	96%	100%	84%	97%	96%	85%	95%	96%	98%	85%	70%	100%
5 3/4 & thru		15%	35%	13%	21%	27%	29%	14%	5%	4%	0%	16%	3%	4%	15%	5%	4%	2%			0%

Mini Trials of winter/spring barley, wheat and oats seeded fall 2008:

The fall planting was quite extensive and several spring varieties were seeded too early (August 28th) which resulted in excess top growth and then severe lodging under the December snow. Much later seeded spring varieties were in much better shape, while the true winter varieties held their own in both late and early seeding.

Conditions up to January 20th 2009 show the lodged spring varieties with some live white roots, while the foliage has completely rotted. They may yet send out new shoots from the crown, but this is not optimal.

Notes and conclusions:

An organic grains field day was put on by Washington State University as part of their newly initiated coastal trials. The three locations Sequim, Snohomish County and Olympia, were chosen as they best represent the varying geography on the Washington coast. I attended at the Sequim(Clallam County) location because of the three sites, it is most like our climate. Dr. Stephen Jones, the new head of the Mt Vernon cereal research and disease nursery, spoke to attendees about the program and its goals. There are approximately 15,000 acres annually seeded to cereals in Skagit County due east of the Saanich Peninsula. On the Olympic Peninsula, our legendary host organic farmer Nash from Nashs' Produce grows up to 70 acres of cereals every year for hog rations. These lucky critters enjoy a diet of local grain, whey from the raw milk dairy next door, and are additionally fenced into the vegetable residue with portable electric wire. They do an excellent job of cleaning up while fertilizing the field at the same time. This seems like the right way to grow hogs, not crammed into barns with the usual antibiotic ladened rations. Why do Washingtonians get to drink raw milk while in BC you need to have your own cow to enjoy the taste and health benefits of grass and forage fed ruminants?

Washington State has extraordinary resources at their disposal, and interested farmers are advised to access information provided on the web with regards to, cereals, pulses and oilseeds, specially suited to, and bred for, PNW conditions and diseases. http://variety.wsu.edu/
Stephen Jones and Kevin Murphy are focusing on organic wheat production and are breeding for the following traits. Vigorous growing taller plants which provide better ground coverage and weed control, allopathic root exudes (like rye), to suppress germination of weeds and weed seeds, increased uptake of zinc and iron (function of variety more so than soil), and perennial wheat with increased nutritional properties due to wild grass influence. Some interim recommended varieties of winter/spring, red/white and Spelt may be available within the next year. Their tool of choice for harvesting small trial plots is a serrated Japanese rice sickle.

As ethanol production has increased, the amount of distillers grains being fed to cows has also increased. Through mid October 2008 the USDA meat inspectors had seen a 50% increase of E.coli in meat samples, and believe that there is a link between these activities. This is not surprising as previous research has shown increased levels of E. coli in grain fed ruminants to the point where Texas A&M University is involved in genetic experiments to reduce the production of E. coli in cattle from grain feeding. Grain, not in excessive amounts, is for hogs, poultry and humans. Grass, forbs and browse, hay, and silage, are for ruminants.

Interest in grain growing seems to be building again as UBC professor Dr. Art Bomke (author of Intensive Winter Cereal Production for South Coastal BC, Dec 1991) and Wayne Temple have recently added some grain trials to their agenda. These trials will be taking place in Delta BC using some genetic material from Stephen Jones amongst others. This is very helpful as it represents a commitment to proper trials and trial procedures and will benefit local growers significantly.

Since the beginning of these trials in 2006, and helped along by the interest generated from the 100 mile diet craze, more and more people are getting the grain bug. Hopefully this will translate into increased awareness and interest in all crops associated with dryland farming. Pulses, oilseeds, and forage legumes offer excellent opportunities for those interested in crop rotation, and reducing their dependence on nitrogen, while at the same time mitigating the seemingly increasing difficulty with growing silage corn. There has also been an increased awareness in the tools, time, and equipment needed to successfully and meticulously harvest, store, and sell food grade crops. The inventory of such equipment on Vancouver Island is slowly building. (yea!!)

I would like to thank, from the bottom of my heart, all the people and farmers who still may think I'm bonkers, but nevertheless volunteered for all aspects of these trials while patiently listening to me ramble on about grain growing. Listed in random order and with equal importance, I hope that I have not missed anyone, Jim Lavich, Rob Clement, Gord Rickard, Bryce Rashleigh, Jack Mar, Terry Michell, Chris Gosling (Vantreight Farms), Dave Aylard, Ken Fox, Doug Higginson, Graeme Fowler and the Comox Valley Farmers institute, Tom Henry, John Buchanan, Sharon Rempel, Wayne Haddow, Jill Hadfield, Pat Hayes, the ASBC, and the folks who took time out to attend our grain field days. You people all rock. Lastly, my patient family who have resigned themselves to eating my home baked bread experiments, but are forever supportive.

Sincerely
Mike Doehnel
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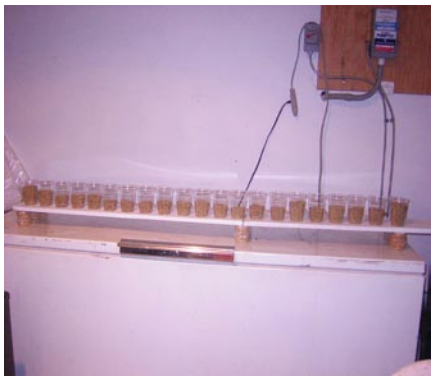
250 652 4354

I would also encourage people to email me if they feel that parts of these reports are incorrect or inconsistent with their own findings, so that information may be added of updated later, and that we may continue to refine the process of growing cereal grains on Vancouver Island.



Historical Barley Collection - 1980 to 2002

Variety	Test Number	Year Released in Canada
ARGYLE	BT 120	1981
HARRINGTON	TR 441	1981
ELLICE	TR 212	1986
STEIN	TR 479	1987
B1602	BT 922	1989
CRÈME	BT 477W	1990
MANLEY	TR 490	1990
TANKARD	BT 477	1990
AC OXBOW	TR 226	1990
B1215	TR 930	1990
AC BUFFALO	BT 374	1994
AC METCALFE	TR 232	1994
EXCEL	BT 201	1994
ROBUST	BT 200	1994
CDC STRATUS	TR 128	1994
CDC SISLER	BT 433	1996
CDC UNITY	TR 139	1996
FOSTER	BT 204	1997
MERIT	TR 970	1998
CDC YORKTON	BT 459	1999
CDC COPELAND	TR 150	1999
B1202	TR 934	2000
CDC SELECT	TR 153	2000
CDC BATTLEFORD	BT 456	2001
CDC TISDALE	BT 462	2001
LEGACY	BT 950	2001
NEWDALE	TR 258	2001
CONLON	TR 982	2001
TRADITION	BT 954	2002
CDC SPRINGSIDE	BT 478	2002
CALDER	TR 262	2002
CDC GOODALE	TR 166	2002

Where Developed	Characteristics
University of Manitoba	Six-row Malting
University of Saskatchewan	Two-row Malting
Agriculture Canada, Winnipeg	Two-row Malting
University of Saskatchewan, Saskatoon	Two-row Malting
Busch Ag. Res./Alberta Wheat Pool	Six-row Malting
University of Saskatchewan	Six-row Malting
University of Saskatchewan	Two-row Malting
University of Saskatchewan	Six-row Malting
Agriculture Canada, Winnipeg	Two-row Malting
Busch Ag. Res./Alberta Wheat Pool	Two-row Malting
Agric.& Agri-Food Canada, Brandon	Six-row Malting
Agric.& Agri-Food Canada, Brandon	Two-row Malting
University of Minnesota	Six-row Malting
University of Minnesota	Six-row Malting
University of Saskatchewan	Two-row Malting
University of Saskatchewan	Six-row Malting
University of Saskatchewan	Two-row Malting
North Dakota State Univeristy/UGG	Six-row Malting
Busch Ag. Resources/Alberta Pool	Two-row Malting
University of Saskatchewan, Saskatoon	Six-row Malting
University of Saskatchewan, Saskatoon	Two-row Malting
Busch Ag. Resources/Agricore	Two-row Malting
University of Saskatchewan	Two-row Malting
University of Saskatchewan	Six-row Malting
University of Saskatchewan	Six-row Malting
Agricore/Busch Ag. Resources	Six-row Malting
Agric.& Agri-Food Canada, Brandon	Two-row Malting
N. Dakota State University/Cargill	Two-row Malting
Agricore/Busch Agri. Resources	Six-row Malting
Crop Development Centre, Saskatoon	Six-row Malting
AAFC, Brandon	Two-row Malting
Crop Development Centre, Saskatoon	Two-row Malting

Zadooks 73 to 76 on Canadian, 65 to 70 on UK and 65 to 67 on wheat July 16 2007

Variety	Year Release	Characteristi	mildew	stripe rust	scald	flagleaf	Lodging	pregerminati
HARRINGTON	1981	2 row malt			y	G		
ELLICE	1986	2 row malt			y	G		
STEIN	1987	2 row malt			y	F	y	y
MANLEY	1990	2 row malt		y		F	y	y
AC OXBOW	1990	2 row malt			y	G	y	yy
B1215	1990	2 row malt			y	F	y	yy
AC METCALFE	1994	2 row malt			y	F	y	yy
CDC STRATUS	1994	2 row malt			y	F	y	y
CDC UNITY	1996	2 row malt			y	F		y
MERIT	1998	2 row malt			y	F		y
CDC COPELAND	1999	2 row malt	y			G		
B1202	2000	2 row malt				G		
CDC SELECT	2000	2 row malt	y			G		y
NEWDALE	2001	2 row malt	y	y	y	F		
CONLON	2001	2 row malt		y		G		y
CALDER	2002	2 row malt	y	y		G		y

Variety	Year Release	Characteristi	mildew	stripe rust	scald	flagleaf	Lodging	pregerminati
ARGYLE	1981	6 row malt		y		P	y	y
B1602	1989	6 row malt		y		P	y	y
CRÈME	1990	6 row malt	y			P	y	y
TANKARD	1990	6 row malt	y	y	y	P	y	y
AC BUFFALO	1994	6 row malt	y			P	y	y
EXCEL	1994	6 row malt	y	y	y	P	y	y
ROBUST	1994	6 row malt	y	y	y	P	y	y
CDC SISLER	1996	6 row malt	y	y	y	VP	y	y
FOSTER	1997	6 row malt	y	y	y	VP	y	y
CDC YORKTON	1999	6 row malt	y		y	P	y	y
CDC BATTLEFORD	2001	6 row malt	y	y	y	P	y	y
CDC TISDALE	2001	6 row malt	y		y	P	y	y
LEGACY	2001	6 row malt	y	y	y	VP	y	y
TRADITION	2002	6 row malt	y	y	y	P	y	y
CDC SPRINGSIDE	2002	6 row malt	y	y	y	P	y	y

White federation	HWS	sharon					P	
hulled casa R emmer	EMM	robert	stayed vegetative					
black emmer (einkorn)	EIN	sharon					G	
whole casa R emmer	EMM	robert	stayed vegetative					
allen	HWS	sharon				y	F	
timophevi	HWS	sharon					G	
bishop	HWS	sharon					F	
big club	HWS	sharon				y	G	
avonlea	DUR						G	
morse	DUR						F	
Golden 86	HWS						G	

UK Varieties

Decanter	destill	2 row malt		y			G	
Oxbridge	destill	2 row malt					G	
Appolusa	destill	2 row malt					G	
Troon	destill	2 row malt					G	
Westminster	brew	2 row malt					VG	
2 rows golden flax								
4 rows red teff								

Rating		
	very poor	**VP**
	poor	**P**
	fair	**F**
	good	**G**
	very good	**VG**
	excellent	**EX**

y = yes for observed

2008 fall seeding

west

Variety	Characteristics	mildew	stripe rust	scald	flagleaf	Lodging	pregermination		
cerebs	HRS								
hard red calcutta	HRS								
lofthouse	HRS								
red bob 222	HRS								
stanley	HRS								
park	HRS								
saunders	HRS								
wa 7936	SWW								
sicily	HRS ?								
avonlea	DUR								
strongfield	DUR								
snowbird	HWS								
wa 7918	SWW								
finch	SWW								
rod	SWW								
eltan	SWW								
(south)									
cdc baler	spring oat								
ac gwen	spring oat								
cdc mcquire hulless	spring barley								
ac ranger 2R	spring barley								
cdc cowbow 6R	spring barley								
(north)									

west

Variety	Characteristics		mildew	stripe rust	scald	flagleaf	Lodging	pregermination		
braemar	spring barley									
quench	spring barley									
cocktail	spring barley									
publican	spring barley									
tipple	spring barley									
optic	spring barley									
cyrstalia	spring barley									
cellar	spring barley									
pewter	spring barley									
flagon	winter barley									
pearl	winter barley									
faust	hulless barley	brown								
soft white	SWS									
blue1	hulless barley	purple								
blue2	hulless barley	purple								
ac brio	HRS									
QW	HRS									
OR79	winter barley	forage								
OR710	winter barley	forage								
0R711	winter barley	forage								
OR712	winter barley	forage								
strider/doyce	winter barley	hulless								
(south)										
bluebird emmer										
vernal emmer										
lenz emmer										
dan jason emmer										
(north)										

Rating		
	very poor	**VP**
	poor	**P**
	fair	**F**
	good	**G**
	very good	**VG**
	excellent	**EX**

y = yes for observed

Spring seeding of wheat and barley 2008

Variety	Awns	Characteristics	mildew	stripe rust	scald	Brown dots	flagleaf	Lodging	pregermination
Kamut	y				Y			G	P	
Pollard	y	HRS			Y			VG	F	
QW	y	HRS			Y			VG	F	
AC Brio	y	HRS			Y			VG	G	
Keremeos Red Fife		HRS	Y	Y	Y			F	P	
Early Red fife		HRS	Y	Y	Y			F	F	
Calcutta	y	HRS			Y			F	F	
Loft House	y	HRS			Y			F	F	
Red Bob		HRS			Y			F	F	
Stanley	y	HRS			Y			F	F	
Park	y	HRS			Y			F	F	
					Y					
Saunders	y	HRS			Y			F	G	
cerebs	y	HRS						F	F	

The HRS that is not recommended (except red fife) will be grown out again as there were some issues with fertitily and the susequent growth was not fully indicative of the variety potential

Variety	Characteristics	mildew	stripe rust	scald	Brown dots	flagleaf	Lodging	pregermination
Flagon winter barley	Feb seeding	Y-		Y-	Y		F+		
Pearl winter barley	Sept seeding			Y-			G		
Braemar				Y-			G		
Cellar				Y-			VG		
Optic	distilling			Y-	Y+		F+		
Tipple		Y-		Y-	Y		G		
Publician	distilling			Y-			G		
Quench				Y-			G		
Pewter				Y-			G		
Cocktail	distilling			Y-	Y		F+		
Cristialia				Y-			G		

Six Row winter barley November 2007 seeding

OR 71	Y+		Y-	Y		G		
OR 72	Y-		Y-			G+	P	
OR 73	Y		Y-			G		
OR 74	Y		Y-			G		
OR 76	Y		Y-			P		
OR 77	Y		Y-			G+		

Martindale

CDC Baler	Oats						G		
CDC Cowboy	2 row barley		Y	Y			F		
AC Ranger	6 row barley		Y	Y			F		
AC Gwen	hulless oats						G		
Golden 86	HWS						G		
McQuire Hulless	2 row barley						G		

y = yes for observed

Rating		
	very poor	VP
	poor	P
	fair	F
	good	G
	very good	VG
	excellent	EX

36 Varieties	
	provisionally recommended
	ok on a good year
	take your chances

True Spring varieties		
end use	**spring seeding**	**fall seeding**
silage/graze/hay/covercrop	March 01 to June 15	Aug 01 to October 01
grain	Feb 15 to May 15th	Sept 18 to Oct 05
True winter varieties		
end use	**spring seeding**	**fall seeding**
silage/graze/covercrop		Aug 01 to Aug 26
grain		Aug 22 to Sept 15

CANADIAN MALTING BARLEY TECHNICAL CENTRE

Analysis Report

Date October 30, 2008

Client: Milke Doehnel

Sample No. OT-08-022 & B-08-076

Sample Type: **McGuire barley and malt sample**

Malt Analysis	OT-08-022
Moisture (%)	6.8
Friability (%)	89.6
Fine Extract (%)	89.3
Coarse Extract (%)	87.3
F/C Difference (%)	2.0
Soluble Protein (%)	3.31
Total Protein (%)	7.74
S/T Ratio (%)	42.8
ß-Glucan (ppm)	412
Viscosity (cps)	1.63
Diastatic Power (°L)	107
Alpha Amylase (D.U.)	51.5
Wort Colour (asbc)	1.22
Wort pH	6.06
FAN (mg/L)	132

Barley Analysis	B-08-076
Moisture (%)	12.7
Protein (Leco, %)	9.62
Germination (%)	
4 ml	97.0
8 ml	94.5

Deye Tian
Malting and Brewing Technologist

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