2005 Historical Wheat Project

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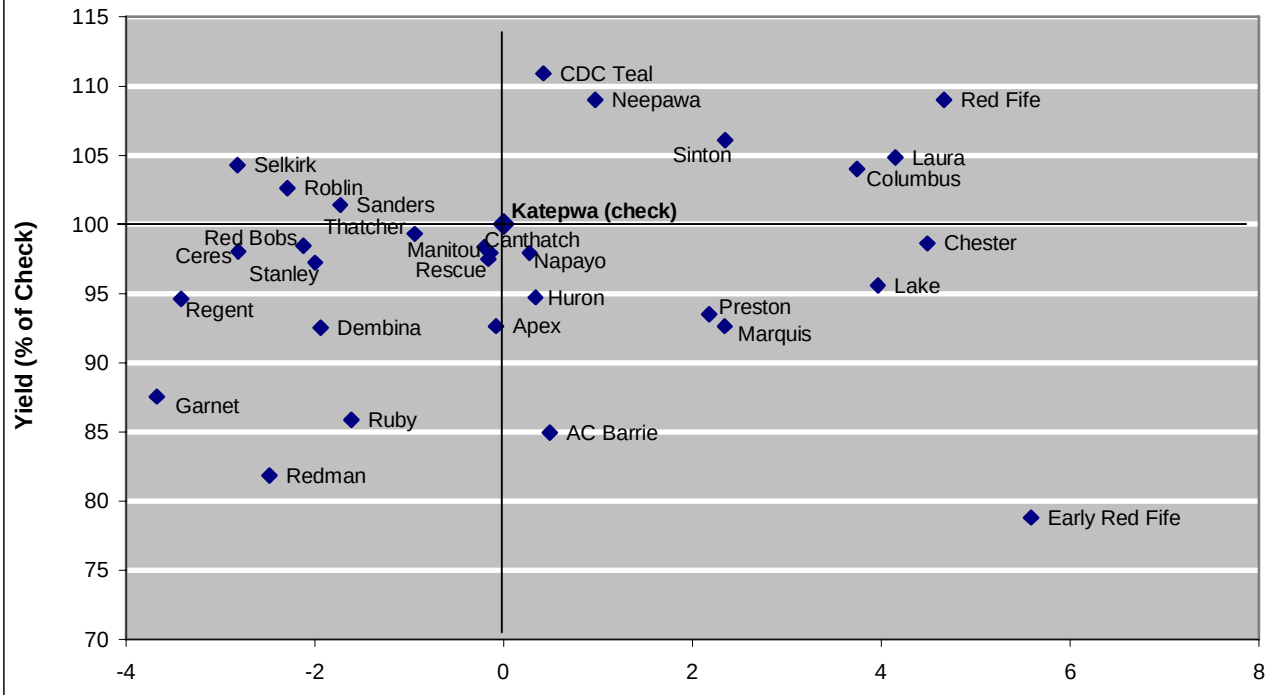
Introduction: The following is a brief disclosure of data collected from a historical wheat study undertaken at both the Dawson Creek and Fort St. John research farms that are run by the BC Grain Producers Association. The study was set up in 2005 in an effort to look at a snapshot of where plant breeding in Western Canada has taken us in the Canadian Hard Red Spring Wheat (CWRS) class. The data must be treated as just a snapshot or loose trend, as although resulting statistical values proved the data collected to be very sound and reliable in 2005, it is still just from one year and only at two stations. Only general comments will be made due to this reason and more solid conclusions should not be read into this report. Even with its apparent restriction on any solid conclusions, the results prove very interesting and show a positive trend in wheat trait improvements.

Methods: Seed was supplied from Dr. Pierre Hucl and after germinations were found, seed was weighed adjusting for both germ and seed size to reach a planting population of 250 viable plants per square metre. Dawson Creek (DC) and Fort St. John (FSJ) were both planted May 13th, and DC was fertilized at a rate of 43-30-18-0 actual lb/ac NPK-S, FSJ at 38-27-15-14. These were the recommended rates supplied from earlier separate spring soil samples. A random complete block design was used at each site involving three replicates, (seed supplies did not allow for a fourth replicate). Buctril-M® (bromoxynil + MCPA) was used for weed control at DC at 400 ml product per acre, and Refine-Extra® (tribenuron methyl) was used at 8 grams product per acre at FSJ, both with good results. FSJ was stressed in June and July due to excessive rains (80% above the normal for June alone). Good moisture levels existed at both sites after the heavy June rains for FSJ, and resulted in heavy yields for both sites, although FSJ was delayed in maturity due to excessive earlier rains and continued soil moisture into the fall season. DC was harvested on September 22nd and FSJ on October 14th, 2005. The spread in harvest was a direct result of the maturity delay in FSJ as well as an extremely early killing frost that hit the DC site on August 16th with a second lighter frost on the 17th. These two frost events forced an early finish to the later wheat lines at the DC site as evident by the separate DC data for lines like *AC Barrie* that places it with a much earlier maturity than that normally found for it in our area.

Conclusions: As mentioned above, solid conclusions are limited as this is data from only one season at two stations, however, a couple of trends seem to be evident. First, Graph A shows us that the later developed lines, (as in date of release), and as represented by *AC Barrie*, *CDC Teal*, *Roblin*, and *Katepwa*, have significantly decreased maturity periods when compared to the days of *Red Fife*. *CDC Teal* does well in our area regarding yield and relative quality, and it is well known by those of us in the BC Peace that *AC Barrie* does not. The data seems to mimic this trend, which is a good "check" of the data, although the maturity of *AC Barrie* from the DC site (see Graph A) is questionable due to the early frost, the overall trend seen in Graph A still makes sense. Data from FSJ, Graph B, seems to demonstrate the most accurate placement of the lines regarding maturity, a site unhindered by any early frost, at least when compared to longer term data gathered in the BC Peace from regional wheat trials grown at the same two sites. Graph C illustrates the overall average for the BC Peace River region and is likely the graph worth the most attention, superseding Graph A and B.

Graph A

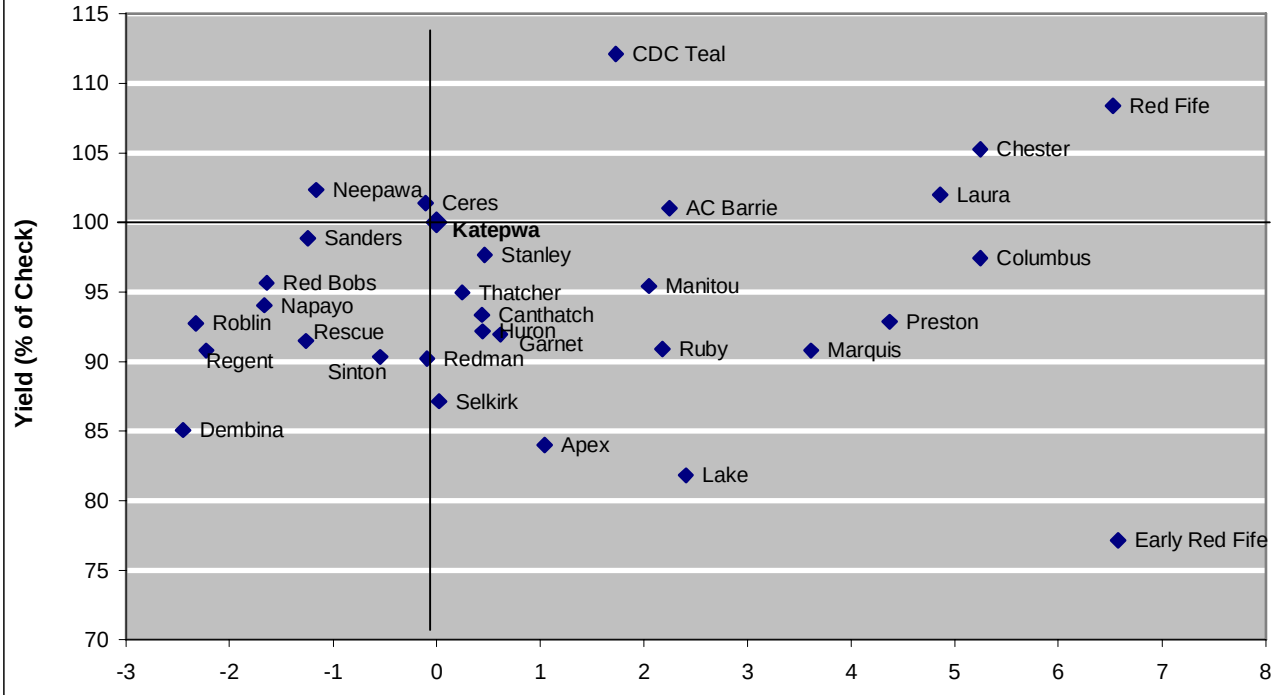
Historical Wheat - Yield vs Maturity - Dawson Creek - 2005



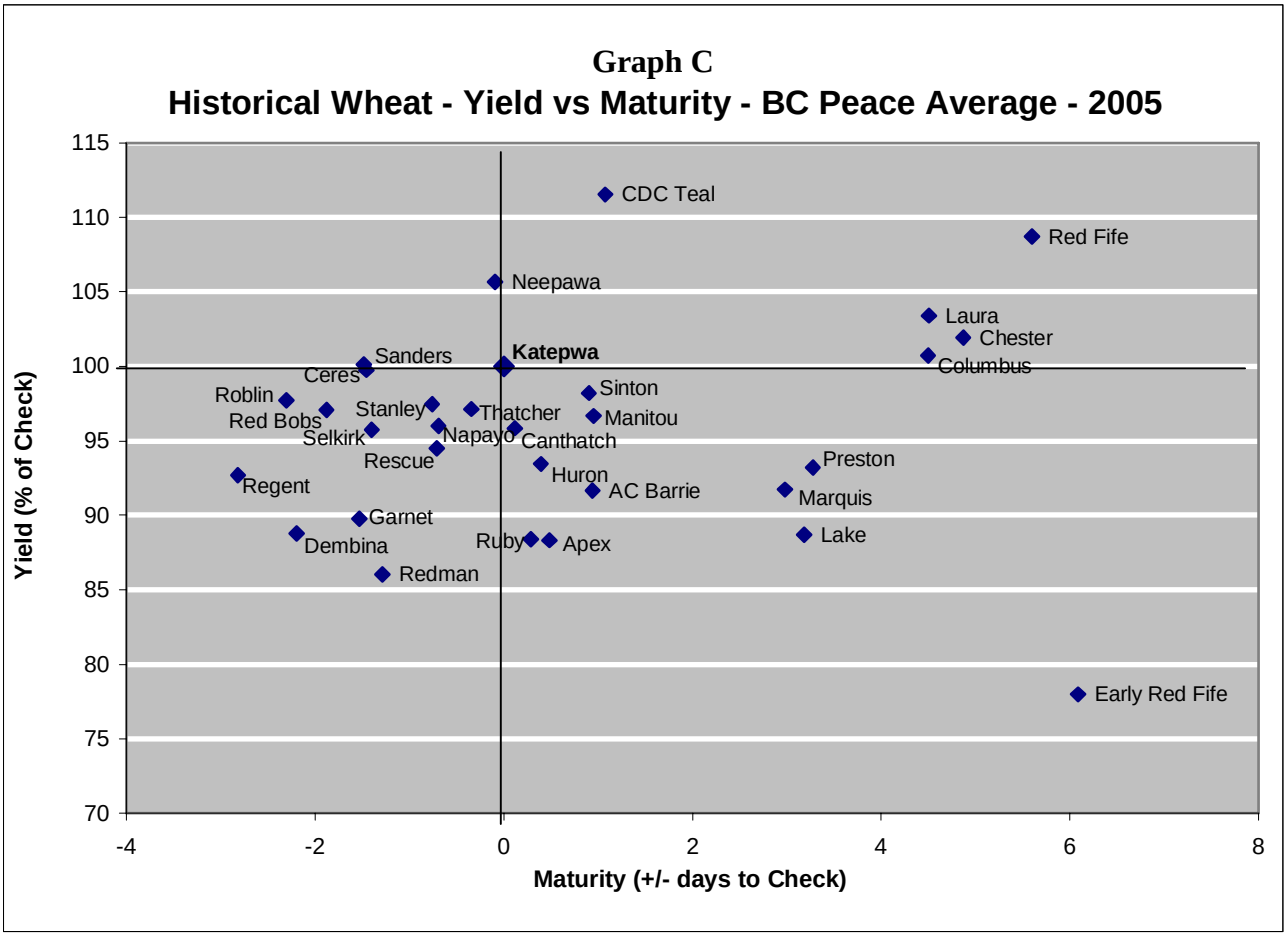
CV (stats) = 5. 3% yield, 1.29% maturity

Graph B

Historical Wheat - Yield vs Maturity - Fort St. John - 2005



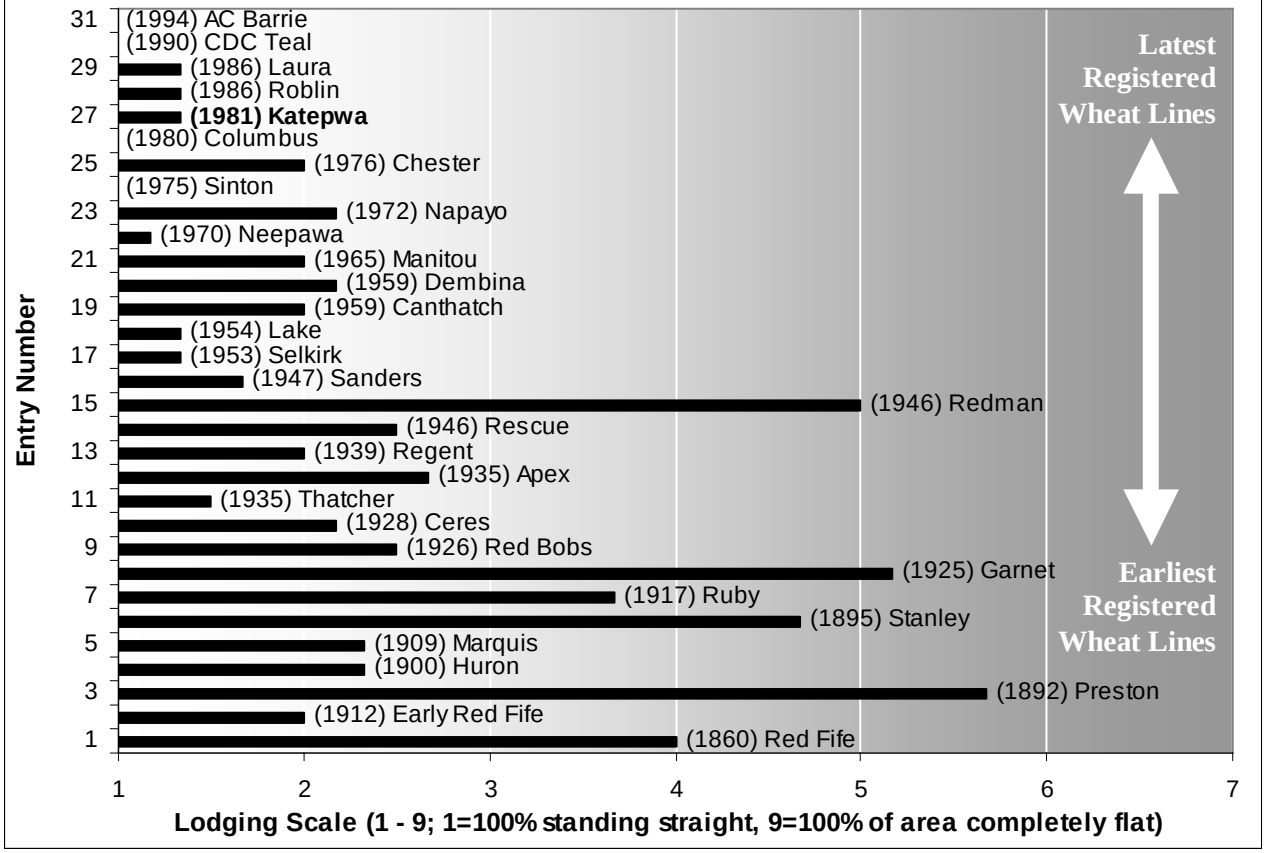
CV (stats) = 4.7% yield, 1.58% maturity



One interesting note is regarding the apparent headway made in lodging resistance. Graph D illustrates lodging results gathered from FSJ in 2005, the only site that had lodging present, likely as a direct result of the extra rainfall and outstanding growing conditions the site experienced in 2005. The older materials (wheat lines) are at the lower half of the graph, and as you move up the graph newer materials clearly show a trend for reduced lodging. The point is reached in 2005 in FSJ, that by the time you look at *AC Barrie* and *CDC Teal*, there is basically no lodging at all, even in a year with heavy rains. The mystery is easily explained when you look at the averaged height data on Graph E, which mimics Graph D quite well. As you look at the latest materials (the wheat lines at the top of the graph), the heights diminish considerably. Clearly breeders have made a conscious effort to get heights down. This is not saying straw-strength is directly related only to height, but if one had had the opportunity to view the tall gangly look of *Red Fife* in the trials this past year, and then look at the straight standing but much shorter *AC Barrie* and *CDC Teal* plots, the trend would be clearly established.

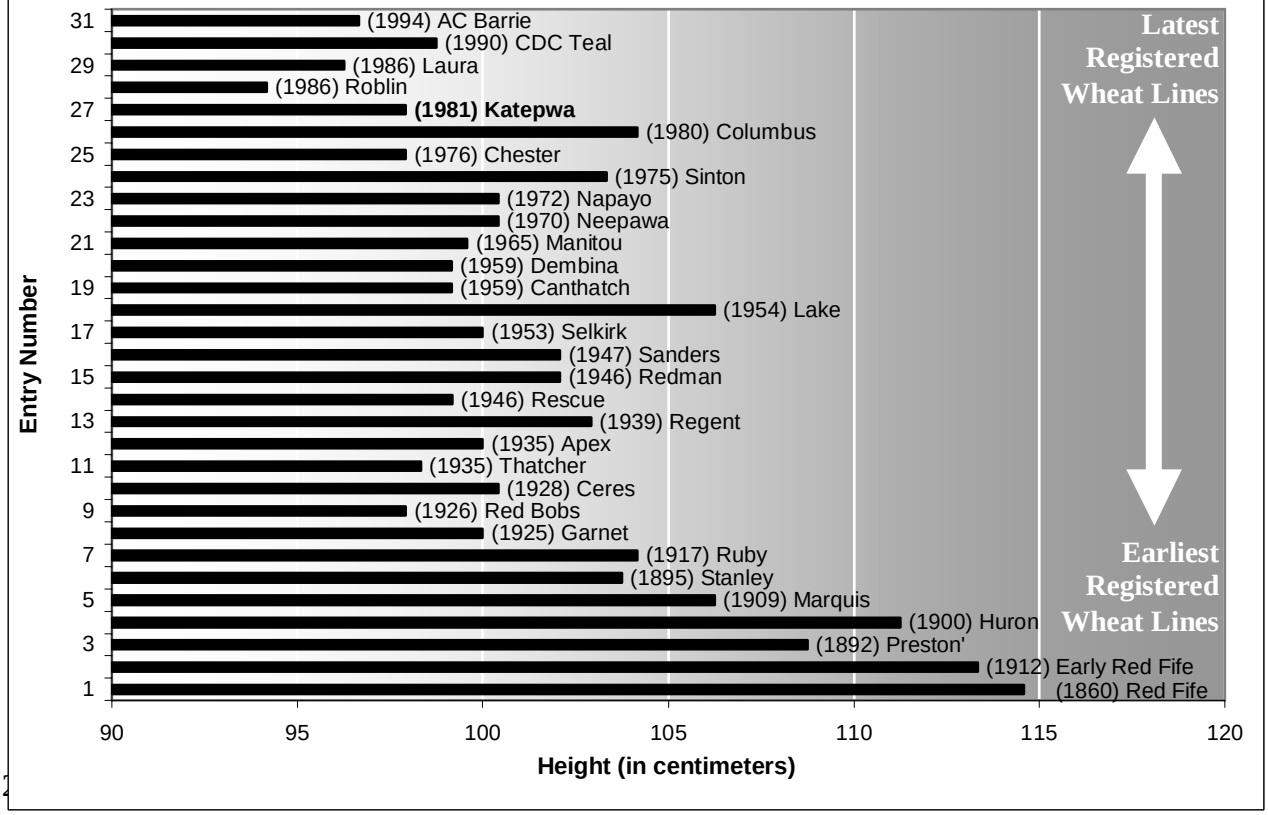
Graph D

Historical Wheat - Lodging (1 - 9 scale) - Fort St. John - 2005

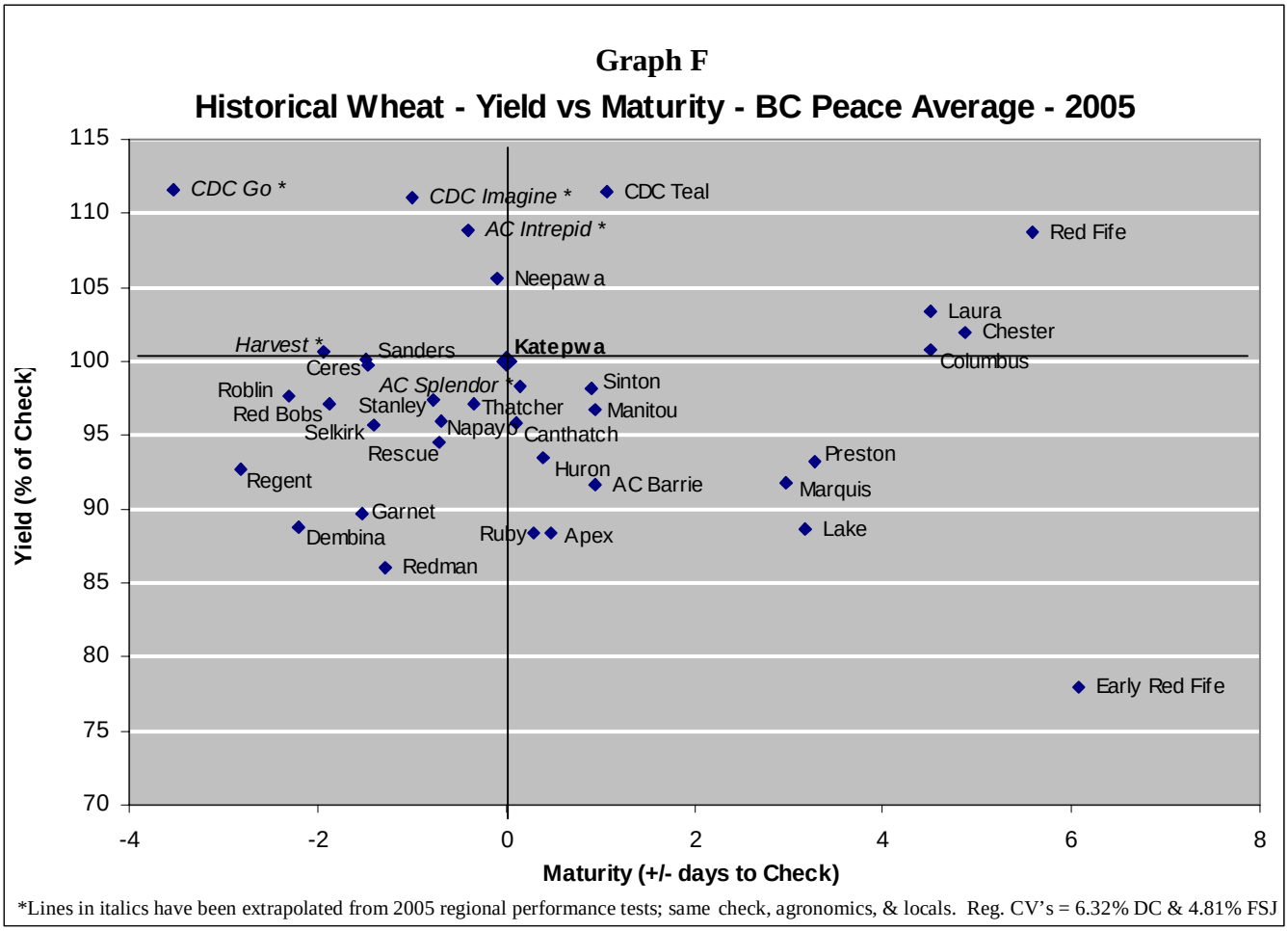


Graph E

Historical Wheat - Height (cm) - BC Peace Average - 2005



The only criticism that could be said, (keeping in mind the limited scope of any comment from this one year two station data set), is that there does not seem to be any recent gains made in CWRS breeding for earlier high yielding materials since say *Roblin*. *CDC Teal* shows an increase in yield, but is comparable to *Katepwa* in maturity, a true enough conclusion again as based on our regional performance tests that run every year at these two stations. We still apparently need a higher yielding *Roblin*, however such lines at *AC Splendor*, *CDC Go*, *Harvest*, or *CDC Osler* were not grown in this study as only a few lines were picked for each decade period. Therefore, Graph F is an extrapolation of a few of these key early CWRS wheat lines, which were currently grown in our BC Peace area regional performance tests, taken only from 2005 to be a fair comparison, and compared against *Katepwa* as a common cross-reference check before being used in the graph. It should be noted that all seed was treated the same way in both sets of trials regarding such things as seeding rates, fertilizer, weed control, etc., and in fact the two trials were only metres apart while growing at each of the two stations. As such, it is perfectly legitimate to compare the data in this way, as they are not pulled in from different locals, different years, nor different growing or agronomic conditions. Growing all entries within the same trial is still preferred but not always practical as was the case here. Graph F was needed therefore in order to show that indeed headway has been made in wheat breeding for earlier maturing materials with respect to yield. It should be noted too that none of these extrapolated lines, (from the regional trials grown at the same sites), demonstrated any lodging, and so the improvements in yield for the earlier maturity side of *Katepwa* seems solid regarding both yield and lodging resistance.



*Lines in italics have been extrapolated from 2005 regional performance tests; same check, agronomics, & locals. Reg. CV's = 6.32% DC & 4.81% FSJ

Closing remarks: This concludes the report for the historical wheat study undertaken in 2005 with the BC Grain Producers Association. It was felt that a lot of effort on the association's part is undertaken each year to team up with breeding institutions from across Western Canada, combined with a lot of monetary contributions made annually to our organization via matching-fund funding organizations so that we can actually do the work, and all of it done in part for the purpose of trying to help make improvements in the wheat lines available to producers for our area and other short season zones across Western Canada. Furthermore, sometimes minor incremental increases in success found each year or two actually mask the long-term big leaps in improvement that have been made. Therefore, the association felt it would be good to step back and look at the overall big picture as seen from an historic perspective. This trial was set up to see such a big picture, and although admittedly it is only a snapshot in time, it seems to have demonstrated the improvements made in CWRS class wheat quite well, (as illustrated in Graph F), and for that the study has been a success. Besides that, it was quite interesting for anyone who had the privilege of actually visiting the sites in 2005, to actually take a walk through history within each trial, a rather unique experience especially for those who have been around long enough to witness many of the changes in this class of wheat. For this reason too, the study was a success and therefore we met our two objectives with this project.

The BC Grain Producers Association would also like to conclude by thanking Dr. Pierre Hucl and his staff of the University of Saskatchewan in Saskatoon, Saskatchewan, for first providing us with the seed sources, (much of it unavailable now as they are de-registered materials), and with their corresponding variety registration date information. Without his generous help this project would not have been possible. Further thanks goes out to the Investment Agriculture Foundation of British Columbia, whose matching monetary funds helped pay for this work to be done. Sincere thanks goes out to both institutions.