

Manitoba not yielding to climate change — but don't get complacent

by Doug Wilcox, Manitoba Agricultural Services Corporation

As I write this article it is early January and 6° C outside. With the mild winter we've been having surely no one questions that climate change is occurring. I personally don't question that climate change is happening — but not because of several warm days in January.

The warm days are simply a weather change — a result of El Nino shifting the jet stream north and bringing an unusual amount of “southern comfort” to Manitoba.

Weather changes occur on a daily scale whereas climate change occurs on a multi-year scale. Evidence of climate change therefore comes from multi-year climate analysis, not in the form of a few warm days in January.

Climatologists and environmental experts have studied the multi-year climate data and have reached a general scientific consensus that climate change (warming) is occurring and that under climate change weather patterns may become more variable. In fact it is speculated that because Manitoba is located in the middle of the continent at higher latitudes, it is likely to face earlier and more severe climate change than many other regions.

Long dry summers

The climate change models for Manitoba generally predict that under current climate change scenarios farms will experience longer, warmer and drier summers, with greater potential for precipitation in the spring and winter.

As a result climate change is expected to be a mixed blessing for Manitoba farmers; generally there will be the benefit of a longer growing season but this could be offset by harsher conditions brought on by weather extremes. Manitoba farmers will have to adapt to these changes if they are to remain competitive. Adaptation for Manitoba farmers is not new, over the years farmers have had to adapt to changing markets, technology and transportation systems.

They will now have to adapt to climate change.

Manitoba farmers know all too well that there is a strong relationship between climate and annual yields. It is quite reasonable to expect that as the climate changes that crop yields would also change. Determining the

impact of climate change on crop yields is important because the key to a successful crop production sector in Manitoba is predictability; climate change could be reducing that predictability.

Yield impact

Since there is clear evidence of early stage climate change in the climate record one might ask if there is similar evidence in the crop yield record? An answer is important because in order to determine how Manitoba farmers should adapt to climate change, it is necessary to estimate the impact of climate change on crop yields.

The Manitoba Agricultural Services Corporation (MASC) has collected yield data from its production insurance clients for over 40 years. Analysis of this data should show any yield trends and reveal if there is evidence of any climate change impacts on yields in recent years.

Figure 1 is a plot of the average annual yields and yield trends since 1966 for four major crops in Manitoba. Each point on the trend line represents an average of the previous 10 years. Look at the yield trend lines — there is nothing distinct about the yield trends in recent years that I would attribute to climate change.

Overall crop yields are generally higher in recent years but this is consistent with historical trends. Unlike many climate records, there are no sudden jumps or drops in the yield record from recent years that could be an indi-

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cator of climate change. Some might say that the recent increases in yields could be due to climate change but in my opinion I would think a more reasonable explanation would be that they are primarily a result of ongoing technological advancements in crop agriculture (bigger equipment, more varieties, new pesticides, etc).

Technological change

Increased climate variability should lead to increased crop yield variation. A statistic called the coefficient of variability (CV) is a commonly used statistic for measuring yield variation. The smaller the CV value the lower is the variation.

Figure 2 illustrates the annual yield CVs and yield CV trends since 1966 for four major crops grown in Manitoba. Each point on the trend line represents an average of the previous 10 years. Look at the trend lines — again there is nothing distinct about the CVs or CV trends in recent years that I would attribute to climate change.

There is no sudden jump or drop in CV that could be considered an indicator of early climate change. Overall CVs are trending down with current CVs being lower than ever. Low CVs mean low yield variability which is inconsistent with the expectations of greater climate variability. This yield variability record is inconsistent with expectations under climate change but is consistent with

my argument that yield changes are primarily the result of ongoing technological advancements.

Although in respect to crop yields and losses in Manitoba climate change appears to have had no significant observable impact to date yet it is important to keep in mind that “absence of proof is not proof of absence.”

Absence of proof

Climate change is occurring. It just has not significantly impacted crop yields in Manitoba — yet. Ongoing technological advancements are obscuring its impact for now, but five or 10 years from now we may see something different.

It is largely only a fortuitous coincidence that many of the technological advancements farmers have undertaken in recent years are occurring during a time of climate change — helping producers to battle early climate change and even neutralizing it.

Even though Manitoba is not yet yielding to climate change this should not lead to complacency. Current cropping practices have operated within a certain range of climate conditions not too different from “normal.”

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As climate change continues to push the limits of this range unexpected significant disruptions may occur. New adaptive measures may extend this range slightly, but one can hypothesize that eventually a tipping point will be reached beyond which adaptive activities will no longer be economically viable. When that tipping point is reached it will negatively impact crop production in Manitoba; yields will drop, yield variability will increase, and extremes in losses will be seen.

To most effectively reduce the vulnerability of crops in Manitoba to the potential impacts of this tipping point, anticipatory adaptation will be necessary — even though it looks like clear combining now.

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Figure 1 – Annual yields and yield trends for canola, flax, red spring wheat, and barley grown in Manitoba for the period 1966 to 2006.

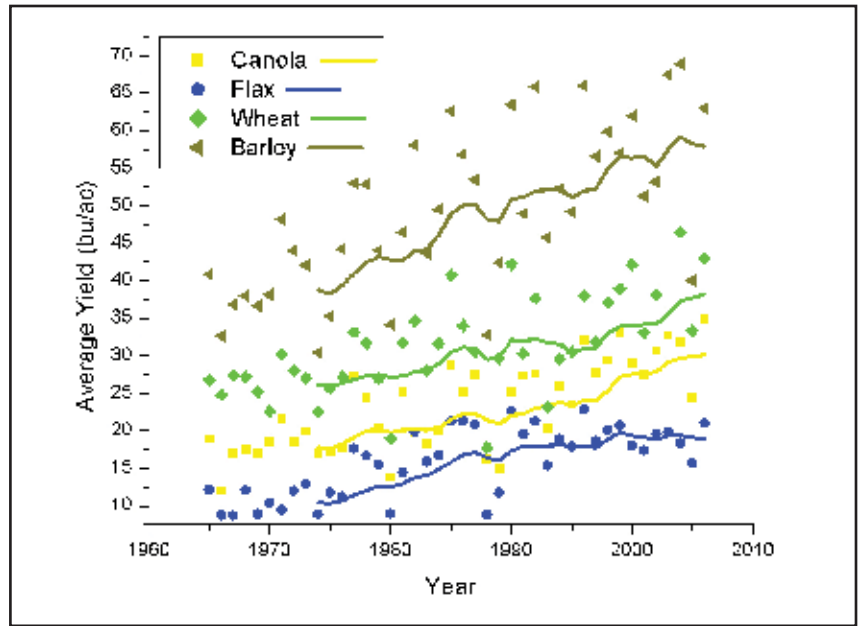
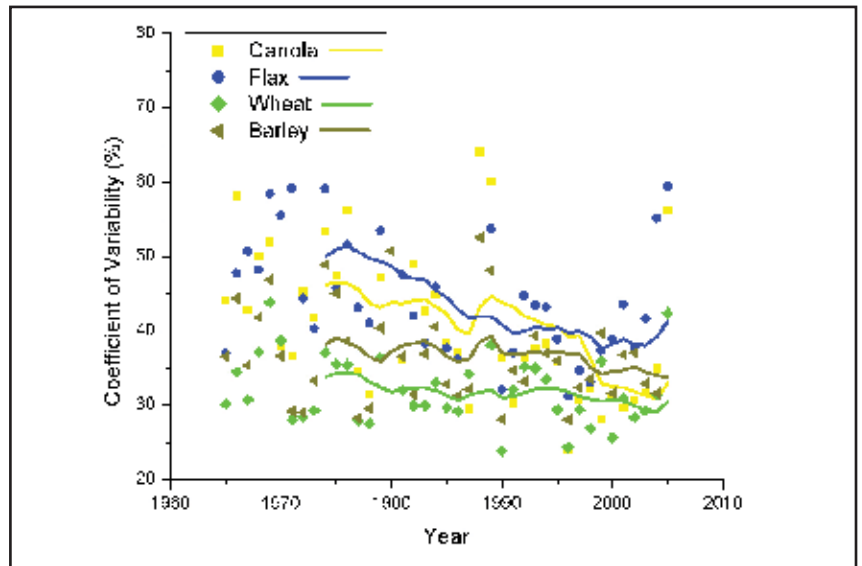


Figure 2 – Annual yield coefficient of variability (CV) and yield CV trends for canola, flax, red spring wheat, and barley grown in Manitoba for the period 1966 to 2006.



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