



A Tale Of Two Beans – MASC Variety Information

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In his novel “A Tale of Two Cities,” Charles Dickens wrote “It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness...” This brings to my mind the wildly contrasting years Manitoba pulse growers have recently experienced. Some of the best pulse yields ever achieved in Manitoba occurred in 2002 and some of the worst in 2004. The 2002 crop year was characterized by weather extremes from heavy rains to hot conditions but crops averaged not too bad. The 2003 crop year had record-breaking yields for small grains and average pulse yields, even though there was drought and heat stress in the latter part of the growing season. The 2004 growing season was one of the coldest on record, resulting in a significant number of crops that

failed to mature. The result is that the yield data from this three-year period reflects a wide mixture of crop stresses – making it an excellent candidate period for agricultural researchers such as myself to analyze.

Selecting Bean Varieties

If you are like most growers, the varieties you grow on your farm have been selected based on your own experience combined with analysis of published regional yield and agronomic data. Typically the published variety information includes data on yield, maturity, and disease resistance, as observed under controlled trial conditions. Information on other traits, such as flooding tolerance, drought resistance, and frost tolerance is not usually available. Additionally growers know that on-farm conditions can influence variety performance. For example a disease resistant variety in an untreated field may consistently out-yield other varieties in a location with

high disease pressure, even though it does not rank among the top yielders in published trial data from sites without this disease pressure.

Is there a way for Manitoba growers to get information on the potential “on-farm” performance of varieties? Yes there is – a good source of on-farm pulse crop variety information is the variety query tool on the Manitoba’s Management Plus Program website www.mmpp.com. Combining the Management Plus information with scientific trial results and agronomic information from such sources as Seed Manitoba, enables pulse growers to make the most profitable variety choice for their farm. Keep in mind that, as long as you stick within recommended varieties, a change in variety is not usually as risky or as costly as other changes in farming practices.

Yield is what makes most pulse growers their money. A grower’s cost of production is largely fixed once
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bacterial blight research and the exchange of students. Canadian growers planned field tours for their Mexican counterparts and discussed cooperation at the NAFTA Technical Working Group. There also was discussion regarding joint promotion of beans (not Canadian beans, not Mexican beans, but beans) in Mexico which generated a lot of interest and will be pursued

by Pulse Canada. Overall, both sides identified a number of opportunities to follow-up on and perhaps the biggest challenge facing them is finding enough time to get everything done.

With all of this goodwill and cooperation is there no longer fear of opening the market to Canadian and American beans in 2008? It’s safe to say that we’re not there yet, but a

foundation has been laid. The Congress motto for the past two years has been “Planting Success” and in 2005 twenty-two Canadians planted seeds in Mexico that will help both countries succeed in reaching common goals. It was definitely better the second time around – here’s to the next report declaring, “the third time’s a charm.” ■



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they decide to plant an acre of crop so anything a grower can do to increase yields without increasing costs increases profitability. That is why it is critically important that growers choose their varieties wisely. Also don't be afraid to switch, any time lag between an improved variety's availability and its acceptance can result in profit loss for a grower.

There is a temptation for pulse growers to select later maturing varieties. After all, given the opportunity to mature, varieties with a longer days to maturity requirement would be expected to yield more – they have a longer opportunity to accumulate nutrients. However, experienced growers know better. Should the growing season be too short, the varieties requiring longer days to maturity period will suffer in both yield and quality. An example of this is illustrated in Figure 1 which compares the yields of the major Manitoba soybean varieties in each year from 2002 to 2004. In 2002 the 120 to 124 days to maturity varieties did best. In 2003 the 128 days to maturity varieties did best and in 2004 the 111 days to maturity varieties did best. Although not illustrated in this presentation similar results occurred with navy beans. Clearly, days to maturity needs to be a consideration when selecting a pulse crop for Manitoba.

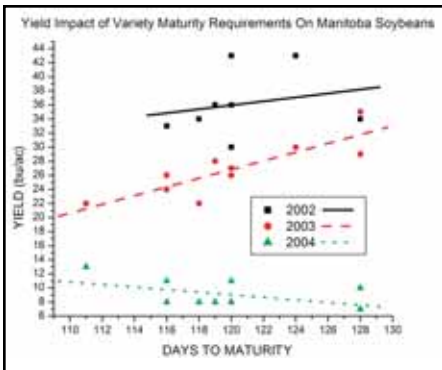


Figure 1. Yield of Manitoba soybean varieties with various days to maturity in 2002, 2003 and 2004. Based on farm yields reported to MASC.

It is my opinion that varieties which perform consistently across various locations should be selected over varieties which only respond well at a single site – even if that site is near your farm. To confidently predict what variety will work best at your farm you need to look at variety information from as many provincial sites as possible. This is because growing seasons everywhere are highly variable and not much weather wise happens at other sites that couldn't happen at your particular farm. A pulse grower who wants to plant a variety that is most likely to achieve or exceed its expected yield, regardless of conditions, needs to look at yield variability. The yield variability of a typical variety is shown in Figure 2. Note how the yields are skewed left. This left skewing is common for yield distributions in Manitoba. The left skewing means that it is easier to get

a lower yield than it is a higher yield! Also note the zero yields – growers often forget that zero yields can often be more than just a small portion of their potential yield scenarios.

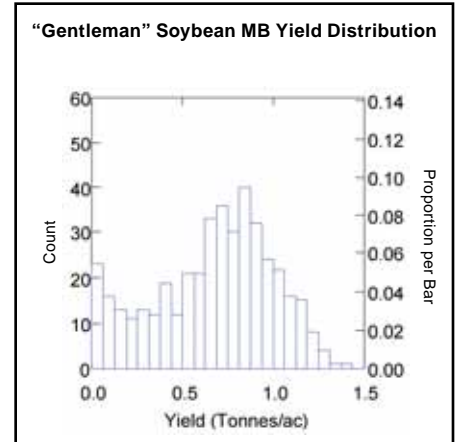


Figure 2. Yield distribution of Gentleman soybean in Manitoba over the period 2002 to 2004. Based on farm yields reported to MASC.

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Pulling Out the Weatherproof Beans

Yield is a function of genetics and environment but because breeders have selected for uniformity in genetics, yield variability is mainly the result of environment alone. Additionally, within the environment component, modern management practices are relatively similar so that yield variability can be said to be mainly due to weather influences. That being the case, pulse varieties that have little yield variability can be considered relatively “weatherproof” compared to varieties that have greater yield variability.

Measuring yield variability enables growers to understand how weatherproof a variety is. Simply put, the more variable a variety’s yield is, the more likely it is to achieve undesirable yields significantly below the expected yield. A measure of variability that is

Table 1. A listing of the days to maturity (DTM), median yield and C.V. for some major varieties of soybeans and navy beans grown in Manitoba. Based on farm yields reported to MASC over the period 2002 to 2004.

Crop	Variety	Rel DTM	N of Cases	Median	Unit	C.V.
Soybeans	OAC Prudence	120	683	19.2	bu/ac	0.672
Soybeans	90A07	120	572	24.9	bu/ac	0.587
Soybeans	90B11 (RT)	130	254	17.0	bu/ac	0.719
Soybeans	Gentleman	115	423	26.4	bu/ac	0.496
Soybeans	Costaud	116	180	22.9	bu/ac	0.506
Navy Beans	Envoy	99	1105	1,450.8	lbs/ac	0.594
Navy Beans	Regent	102	339	1,367.0	lbs/ac	0.673
Navy Beans	Navigator	103	238	1,464.0	lbs/ac	0.607
Navy Beans	AC Cruiser	104	106	1,100.2	lbs/ac	0.687

commonly used is called the Coefficient of Variation (C.V.). The larger the C.V. value the greater the variability. In the case of variety yields the lower the C.V. value the more ‘weatherproof’ is the variety. Table 1 lists the C.V. values for several major varieties of soybeans and navy beans grown in Manitoba over the period 2002 to 2004.

The C.V. for yields of the five major varieties of soybeans grown in Manitoba ranged from 0.50 to 0.72 (Table 1). The earliest maturing variety, Gentleman, had the least yield variability and the highest median yield, 26 bu/ac. At the other extreme, the variety with the lowest median yield and highest yield variability was 90B11. This variety is also the latest maturing soybean variety. In this listing Gentleman is the most weatherproof variety.

The C.V. for the yields of the four major navy bean varieties grown in Manitoba ranged from 0.60 to 0.69. Envoy was the variety with the lowest yield variability and it had the second highest yield, at 1,451 lbs/ac. Envoy was also the earliest maturing variety. AC Cruiser, the latest maturing variety, had the lowest yield variability and the lowest median yield. In this listing Envoy was the most weather-proof variety.

It is possible that more years of data or a more regionally limited analysis could result in more, or different, distinctions between varieties. However, I suspect the general result would be the same as this all-province 2002 to 2004 analysis. For both navy beans and soybeans grown on-farm in Manitoba, the earlier maturing varieties are the best choice for yield success.

Pulling Out the Weatherproof Bean Traits

One of the deficiencies of variety trial data identified previously was that data on traits, such as flooding tolerance, drought resistance, and frost tolerance is not usually available for varieties. MASC is uniquely positioned to provide some insight on these traits – after all MASC tracks which fields have suffered yield losses due to drought, excess moisture, etc.

Table 2 illustrates what percentage of production insurance payments were made to a specific variety of soybean or navy bean for a particular post harvest cause of loss over the period 2002 to 2004. Additionally there is a column listing the variety’s market share. If a variety is as susceptible to a particular cause of loss as any other variety the

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payouts for that cause of loss should not be different than its variety market share. If the payments are greater than anticipated then that variety is more susceptible to that cause of loss than other varieties. The alternative is also true.

Except for the soybean variety Gentleman, the results in Table 2 do not strongly indicate one soybean variety is more or less susceptible to any of the perils listed. This may be an artifact of the limited regional distribution of soybeans resulting in lowered data sensitivity. More years of data or a more regionally limited analysis might result in more distinctions between varieties. If you recall the data in Table 1 indicated that Gentleman was the most weatherproof soybean variety. The data in Table 2 illustrates that compared to other soybean varieties Gentleman may have been disproportionately resistant to frost (the frost percent of payouts is much less than its market share).

The results in Table 2 also do not indicate any one navy bean variety is more or less susceptible to any of the perils listed. Similar to soybeans this may be an artifact of the limited regional distribution of navy beans resulting in lowered data sensitivity. More years of data or a more regionally limited analysis might result in more distinctions between varieties. None-the-less there are hints at trends, such as the navy bean variety, Regent, being

Table 2. A listing by variety of the variety market share and relative post harvest production insurance payment amounts attributed to various causes of loss as a percentage of total crop payments for that cause of loss. Based on farm yields reported to MASC for some major varieties of soybeans and navy beans grown in Manitoba over the period 2002 to 2004.

Crop	Variety	Variety Share	Frost	Exc Moisture	Drought	Hail
Soybeans	OAC Prudence	19.3%	28.4%	35.0%	19.6%	13.8%
Soybeans	90A07	21.3%	24.6%	14.1%	13.8%	53.5%
Soybeans	90B11 (RT)	7.7%	16.9%	10.4%	8.8%	0.0%
Soybeans	Gentleman	21.7%	4.9%	11.6%	32.0%	0.0%
Navy Beans	Envoy	63.7%	55.3%	67.0%	50.6%	35.3%
Navy Beans	Regent	15.7%	21.1%	10.4%	42.7%	0.0%
Navy Beans	Navigator	9.3%	8.8%	10.3%	2.5%	48.5%
Navy Beans	AC Cruiser	4.7%	5.8%	5.6%	4.2%	1.5%

susceptible to drought. Additional data or analysis would be required to clearly identify these traits.

At the end of the Dickens novel “A Tale of Two Cities” the character Carton meets his death at the guillotine with the knowledge that he has finally imbued his life with meaning. Nothing that grandiose has happened in this “Tale of Two Beans” (soybeans, navy beans). This tale has simply illustrated that some soybean and navy bean varieties are more weatherproof than others and that some of this weatherproofing may be the result of tolerance to some identified perils. With more refined analysis of MASC datasets

one could make recommendations for specific variety traits, such as flooding tolerance, drought resistance, winterkill susceptibility and frost tolerance – perhaps creating “the age of wisdom” as Dickens would say. ■

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