

# ROTATION EFFECT ON WHITE PEA BEANS AND SOYBEANS

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It is generally agreed that crop performance is influenced by the crop rotation used. This phenomenon is referred to as the “rotation effect.” While the exact cause of the rotation effect in a particular field may be difficult to explain, it is most likely to result from the impact of rotations on the following: soil moisture and fertility, the buildup of diseases, insects, toxic compounds and weeds, soil erosion, pesticide rotation, economic risk spread, and workload balance. However, in recent years technological innovations in agriculture and economic pressures have challenged the continuing need to be concerned with the rotation effect. To study whether the rotation effect still occurs with pulse crops, the Manitoba Agricultural Services Corporation (MASC) analyzed its database of producer records for white pea (navy) beans and soybeans.

MASC offers production insurance in Manitoba and has been annually collecting information from its clients on what crops are planted on each field and their yields. The acreage of annual crops enrolled in production insurance in Manitoba is over 85 per cent – making the database a very representative and useful reference for studying field scale agricultural practices. MASC has recently utilized these records to determine the average yields of navy beans and soybean crops planted on various stubble types at planting. A summary of this analysis is graphed in Figure 1 (navy beans) and Figure 2 (soybeans). Figure 1 summarizes the yield data reported to MASC for the 10-year period of 1997 to 2006, from fields 120 acres in size or larger throughout Manitoba. Figure 2 summarizes the yield data reported to MASC for the 5-year period of 2001 to 2006, from fields 120 acres in size or larger throughout Manitoba. The shorter time period in Figure 2 is due to a shorter significant acreage experience

period with soybean plantings in Manitoba. Only rotations that occurred in all years of the experience period are presented. Analysis was limited to larger fields because MASC does not track field positions within quarter sections.

MASC records can be used to determine the relative acreage of the major stubble types at planting used by crops. For example, over the period analyzed, the top three stubble types at

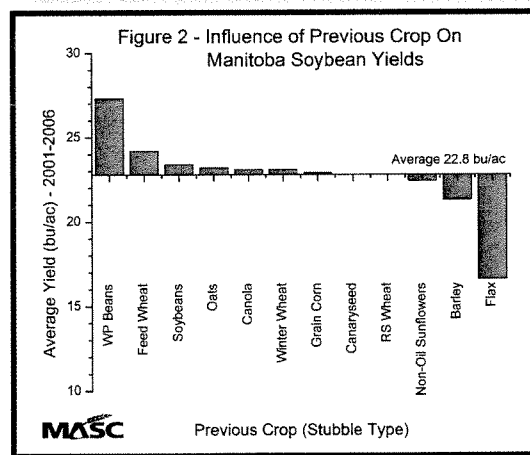
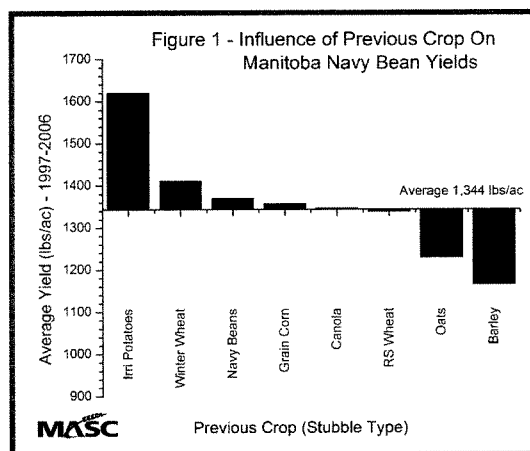
between the best and worst stubble were 455 lbs per acre for navy beans and 11 bushels per acre for soybeans. Stubble types at planting that resulted in the highest yields for navy beans were potato, winter wheat, and navy bean. The stubble types that resulted in the highest yields for soybeans were navy beans, feed wheat and soybean. Although the basis of the rotational yield benefit observed has not been studied, all these crops are generally known for leaving high residual fertility in their stubble for subsequent crops. MASC records indicate the yield of navy beans planted on irrigated potato stubble was on average 15 per cent higher than navy beans planted on navy bean stubble. Similarly, the yield of soybeans planted on navy bean stubble was on average 14 per cent higher than soybeans planted on soybean stubble. Additionally, MASC records revealed the unexpected finding that rotating navy beans and soybeans with cereals didn't necessarily lead to higher yields.

At the other extreme, MASC records indicate the type of stubble at planting that resulted in the lowest yields for navy beans was barley and for soybeans was flax. The basis of the rotational yield loss observed has not been studied. MASC records indicate that over the period of the study the yield of navy beans planted on barley stubble was on average 15 per cent lower than navy beans planted on navy bean stubble. The yield of soybeans planted on flax stubble

was on average 29 per cent lower than soybeans planted on soybean stubble.

In annual crop rotations, it is usually recommended that producers avoid planting fields with the same crop two or more years in a row. It was determined over the study period that when navy beans were planted on navy bean stubble, the average yield achieved was two per cent higher than the provincial average yield. Similarly when soybeans were planted on soybean stubble, the average yield achieved was three per cent

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planting for navy beans were red spring wheat (44 per cent of acres), navy beans (10 per cent of acres), and oats (eight per cent of acres). The top three stubble types for soybeans were red spring wheat (29 per cent of acres), oats (17 per cent of acres), and canola (10 per cent of acres). Soybeans planted on soybean stubble occurred on eight per cent of the acres over the period of study.

MASC records illustrate that the stubble type can have a significant influence on yields. During the period studied, the difference in average yield

# FEDERAL GOVERNMENT INVESTS IN THE PULSE INDUSTRY

## NEWS RELEASE

Winnipeg, Manitoba, February 21, 2008

The Government of Canada is working hard for farmers by investing in a transportation strategy that will ease the movement of crops across the country and around the world. James Bezan, Member of Parliament for Selkirk-Interlake, made this announcement today on behalf of the Honourable Gerry Ritz, Minister of Agriculture and Agri-Food and Minister for the Canadian Wheat Board, during the Manitoba Special Crops Symposium.

"The Government of Canada is proud to provide funding to help our farmers compete and profit in an export-dependent market," said Mr. Bezan. "By investing in projects like this one we will continue to build our reputation as a global leader in pulse production and distribution."

The federal contribution of \$600,000 to Pulse Canada's transportation strategy, through Agriculture and

Agri-Food Canada's Advancing Canadian Agriculture and Agri-Food Program, will improve the efficiency and reliability of domestic transportation of pulse and special crop products. Domestic transportation is the first leg in the export movement of pulse and special crops, like lentils, beans, peas and chickpeas, which are exported to over 160 countries around the world.

From Canadian farms to international dinner tables, this export industry moves its crops farther than any other major exporters. This Government understands that smooth transportation is the cornerstone to increased competitiveness of the industry.

The transportation strategy will include consultations with stakeholders, investigations of transportation trends, development of a demand forecasting model as well as the development of an education program for the pulse and special crops shipping industry. The strategy will allow stakeholders to

work together and with Government to identify and resolve transportation issues for the pulse and special crops industry.

"Consistent and reliable transportation is key to profitability in this industry," said Murad Al Katib, Vice Chair of Pulse Canada and President of Saskcan Pulse Trading. "It's an important issue for growers, processors and exporters and that's why the development of the strategy and the search for innovative solutions at Pulse Canada is a top priority."

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higher than the provincial average yield. MASC records indicate that Manitoba producers are not suffering any yield loss when planting navy beans on navy beans or soybeans on soybeans. That does not mean that planting fields with the same crop should now be a recommended practice! These results are from a survey of MASC records and not from a scientific trial with standardized treatments. Additionally, the basis of the yield response has not been studied. The lack of yield loss could be an artifact of low risk fields being planted, or above average management inputs being applied, or some other confounding variables.

MASC records demonstrate that for navy beans and soybeans, the rotation effect still exists and despite current technological advances is worth on-going consideration. Over the period studied, field rotation differences in Manitoba resulted in yield differences of around 30 per cent for both navy beans and soybeans. Pulse growers would be wise to consider the rotation effect in their crop planning.

