

## Executive Summary

The purpose of the project is to assist Soy 20/20, the Manitoba Pulse Growers and Manitoba Agriculture in gaining an overall understanding of the value-added opportunity for soybean crushing in Manitoba and to develop a business case for soybean crushing in Manitoba. The overall project objective is to assess the feasibility and market opportunities for a soybean crush plant and create a preliminary roadmap for such a facility. This is done in three parts: Section A - supply analysis and projections, Section B - demand analysis and projections, and Section C - location and market analysis focusing on Manitoba. The final recommendation(s) on the feasibility of a Manitoba soybean crush plant comes from that broad base of data.

For **Section A - supply analysis**, Mercantile addressed in order, the world soybean and soybean product statistics, then those for western Canada and the northern most states (Minnesota and North Dakota) and then created soybean production projections from 2014 to 2024. This analysis of soybean supply in the context of world and Canadian production and acreage is then the supply basis part of the actual feasibility of a soybean crush plant in Manitoba might be determined.

The world's **soybean producers** have increased to 145% of the 2004/2005 levels and to a volume of 314 million mt. Together the top two producers of the world's soybeans are the United States (108 million mt; 32%) and Brazil (96 million mt; 30%).

For Canadian acres seeded to soybeans, currently, 27.6% (1.54 million acres) of the 'area seeded to soybeans' in Canada (5.56 million acres) is in the Prairie Provinces. About 40 % (1.27 million tonnes of total of 3.0 million mt) of the production growth in Canada over the past 10 year is due directly to that of the Prairie Provinces.

Paralleling that, while the growth of the Canadian soybean production from 2004 to 2014 doubled, there was a healthy six-fold of the soybean production in Manitoba and Saskatchewan. Manitoba has grown from 1.1% in 2004 to 15% in 2014 of Canadian soybean production. As of the end of 2014, Manitoba and Saskatchewan together accounted for fully 20.6% of the soybeans produced in Canada.

Production averages for the northern prairies (Saskatchewan, Manitoba, North Dakota and Minnesota) show that soybean production is increasing at an average of 4% per year (0.66 million mt) over the past 5 years (since 2010). As of the end of 2014, Manitoba (1.1 million mt), Saskatchewan (0.16 million mt), Minnesota (8.31 million mt) and North Dakota (5.51 million mt.) produce a total of 15.09 million mt of soybeans.

World **projections** have soybean production increasing by 133% over the next decade, from the current 314 million mt to 418 million mt. Canada's pace of production growth is expected to be 110% over the next decade, growing from 6 million mt to 6.7 million mt in 2024. For Manitoba and Saskatchewan, the growth is projected to be from 1.1million mt to about 1.9 million mt.

For soybean meal, world soybean meal is expected to go up 44% from 199 million mt currently to 287 million mt in the next decade. For soybean oil production, the projections for the world growth at a 45% pace, going from 47 million mt to 56 million mt in the next decade.

For **Section B - the demand analysis**, Mercantile addressed the world, Canadian and western provinces export and import dispositions on soybeans, soybean meal and soybean oil. Projections to 2024/2025 were also done. Feasibility of a soybean crush plant in Manitoba benefits from usage information on and projections about supply of poultry, hogs and cattle, so that is supplied as well.

Overall, the world's soybean **exports** have increased to 180% of the 2004/2005 levels to a volume of 116.5 million mt. Two countries export 81% (U.S. 41%; Brazil 40%) of the world's soybeans. This is projected to grow by 129% to 150 million mt by 2024/2025. Canada's soybean exports are anticipated to increase by 131% to 3.8 million mt in the next decade. For soybean meal, the current export market is considerably smaller at 64 million mt. This is expected to grow by 119% to 76 million mt in 2024/2025. Canada's portion of the export market for soybeans, soybean meal and soybean oil remain very small but the market share is slowly improving.

For soybeans, the world **import levels** are expected to rise by 130% from the current 116 million mt to 150 million mt in 2024/2025. Canada's soybean imports are very small and are not expected to change over the next decade.

World soybean meal projections highlight that while the world import volumes are increasing at 118% over the next decade, from 64 million mt to 76 million mt, Canadian imports are likely to decrease at 15% over the decade from .98 million mt to .95 million mt. On the Prairies, over the same decade, this decline is projected to be stronger, going down 27% from 363,000 mt to 300,000 mt. With the 10 year projection for cattle and hog numbers trending downward over the next decade, the Prairie demand for soybean meal will also be down. The positive projection for chickens and turkeys over the same period is not enough to counter-balance the downward demand projection.

**Section C Viability of a Potential Soybean Oilseed Crush Facility** begins with the all important **industry overview**. In western Canada, there is considerable canola crushing, currently at about 10 million mt annually, but no soybean crushing. The only soybean crushing is currently in Hamilton, Windsor and Trois Rivières. Although the western canola plants could switch to soybean crushing perhaps with small modifications, none do. In Manitoba, there are three crush plants (Bunge at Harrowby and Altona, Viterra at Ste. Agathe) that currently only crush canola seed. As of spring 2015, with the new plant at Camrose, AB, Cargill crush plants will represent about 22% of the canola crush capacity, Bunge about 30%, ADM 16%, JRI 11%, LDM Foods 9%, TRT 6% and Viterra 3%.

The U.S. soybean processing industry is primarily comprised of 16 different companies operating 63 plants in the U.S. It is a mature, consolidated and vertically integrated industry with four companies - Archer Daniels Midland (ADM), Bunge, Cargill and Ag Processing (AGP) - controlling nearly 84% of the processing industry.

Section C – **Feasibility**. Within the industry overview framework, the question of feasibility for a soybean crush plant in Manitoba focused on five distinct areas: location; market dynamics; crush margins; origination and market advantage; and consideration of type and size of plant.

For **location**, the Manitoba Agricultural Reporting regions were overlaid with the soybean production data and the CN and CPR rail lines (Winnipeg and east – Winnipeg and west). Also considered were the location of pigs (in 2011, 48.5% of all pigs in Manitoba in the Eastern Region, 28.0% in the Central Region) and location of all major feed mills in Manitoba (concentrated in or

near Winnipeg, or scattered mainly in crop regions 9, 8 and 7). As a direct result of the following: proximity to soybean production; proximity to rail lines; proximity to feed mills and end users; distance to U.S. crush plants – competitive advantage; and accessibility to additional meal markets, the “sweet spot” for plant location consideration is named as ‘Elm Creek’. That is not the real location but will serve as a ‘place-holder’ location name in the feasibility study.

For **market dynamics**, Mercantile created a farm price parities (FPP) table derived from soybean export market values [‘world price’] which shows the potential value for export and domestic crush for soybean growers in U.S. and Manitoba. Given a well-functioning market, if adequate and regular rail service existed in Manitoba, then both a Canadian and/or a U.S. crusher would find it difficult to compete with the Vancouver export market for soybeans. For the price advantage, all Manitoba soybeans would simply move to the West Coast.

However, optimal conditions in soybean sourcing (sourcing advantage over U.S.; ready market access; Canadian exchange rate; and increases in acreage sown to soybean) do not yet exist. A dedicated soybean crush plant in Manitoba would need the capacity to store and carry soybean supplies at the crush plant beyond December each year (adding costs for storage space and carrying charges).

For **crush margins**, crush margin calculations (returns) are used as an integral part of the decision making process for or against any particular plant location. By comparing the gross and then net crush margin calculations for Brewster, MN, and for ‘Elm Creek, MB’, Mercantile determined that the net margin for MnSP Brewster was Cdn.\$65.74/mt and for the ‘Elm Creek’ example was even better at Cdn.\$79.17/mt when using the export bean parity for soybeans. Consideration of a 15-year payback for plant construction and operation showed that the net margin was still positive for ‘Elm Creek’ at \$134.86.

**Origination and market advantage** is used to define the *inherent advantage or disadvantage over time* for a Manitoba plant location. Based on sufficient soybean supply, a conservative forecast for soybean meal marketing in western Canada and worst-case scenarios for freight, a Manitoba crush plant will have *a total advantage of \$47.58/mt* over northern U.S. crush plants. Taking into consideration total production costs of \$47.74/mt established in the crush margin calculations above, the combined freight advantage and returns on production show a very good *Manitoba gross crush margin* at \$95.31/mt. Two major risks remain, a consistent source of sufficient volume of soybeans and the size of future meal markets in Western Canada.

For **type and size of plant**, the type of plant would have to be either a single use plant or a switch plant. The building of such a plant could be done in one-phase or 2 phases. For a single use plant, a minimum capacity of 2,000 mt of soybeans per day or 695,000 mt annually would be needed. Based on 2014 production numbers, a 2,000 mt per day crush plant in Manitoba needs to attract a high market share of between 37 and 55% of total current Prairie soybean production. The size of the soybean meal market in Western Canada would need to be further developed.

For a multi-use switch plant, a strategy would be that soybeans could be crushed until supplies become harder to source, then canola crushing could take over for the remainder of the crop year. Existing canola crush plants in Western Canada have that capacity; through they do not use it.

Our recommendation is to build a switch plant in 'Elm Creek', Manitoba. With a switch plant designed to crush soybeans and canola, the major weaknesses outlined in the SWOT analysis can be addressed without losing the important economies of scale. This allows a maximizing of potential crush margins and keeps soybean meal production within the existing size of the product market. Importantly, this option still keeps the soybean crush margins obtained from Manitoba soybeans in the province, and maintains all of the positive aspects for grain and livestock producers.

Looking the big picture, we can conclude that the construction of a Manitoba crush plant promises a number of **net benefits for Manitoba**. First, for soybean producers a local crush plant would be of benefit by giving easier access to the market and by the ability to bypass uneven rail freight. It is also likely to generate freight savings and better soybean prices to growers. Livestock producers would equally benefit by gaining a local protein feed supply at competitive prices. Importantly, crush plant owners have the opportunity to earn the crush margins for soybeans, which at the same time would be kept within the provincial borders, rather than being exported to the U.S. In addition, all levels of government would gain through additional tax income. Spin-off effects from the building phase and subsequent economic activity would support the overall economic health of Manitoba. A preliminary partial calculation of the various benefits shows that pre-tax benefits are substantial and appear to be around \$190 million annually.