

Development of Niche Market Pulse Crops for Saskatchewan

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Pulse crops were produced on 870,000 ha (2,170,000 acres) in western Canada in 1993, about 70% of which was in Saskatchewan. Pea was grown on about 1,200,000 ha, while lentil was grown on about 900,000 ha. Pea production will probably increase another 25% in 1994, primarily for the European feed pea market. Current levels of production are based on "mainstream" types, such as Laird (large green) lentil, large yellow pea and large green pea. Continued increases in production require that new markets be developed. These markets will be primarily for smaller volume types, the "niche market" types.

A niche market type pulse normally refers to a type of pulse that is traditionally grown and consumed by an ethnic group, sometimes only by people in a certain part of a country. Examples are the French green lentil and the Spanish brown lentil. A small segment of the population traditionally has consumed this niche market type of pulse, but because of economic conditions, lack of mechanization or some other reason they no longer produce enough to meet their demand. Then the opportunity arises for Saskatchewan to grow these niche market types, increase our markets and sustain our increased production.

A second niche market type of pulse would include unique or novelty types that have no known markets. The current emphasis on new and different foods presents an excellent opportunity for developing a market for a new type of pulse crop. Examples are a zero tannin lentil, a green cotyledon lentil and a red cotyledon pea. One or more of these unique pulse types may become commercially accepted as a new niche market type of pulse and increase the demand for Saskatchewan-produced pulses.

All niche market types of pulses will be tendered as exclusive varieties, i.e., one company will have exclusive rights to a given variety. The company will then contract production with individual growers and all seed must be returned to the company - no slippage allowed! The company must spend time and money finding and developing the market for this specific niche market type variety, and, if successful, they and their contract growers will benefit. In this way the company can maintain a reasonable balance between production and market demand, preventing a seed pyramid whereby the producer ends up with a large inventory of seed of a new type but no market for it. This system has the advantage that the producer has a market for the seed which the company has developed to the benefit of both. Exclusive varieties and contract production will not be restricted to niche market types of varieties in the future, but will become increasingly common with mainstream varieties of all crops.

CURRENT STATUS

The Crop Development Centre (CDC) has intensive breeding programs in pea, lentil, bean, faba bean and chickpea with emphasis on both mainstream and niche market type varieties. The first niche market pulse developed by the CDC was Indianhead lentil in 1986. It is a small black-seeded lentil developed for use as an annual legume green manure crop and is being used on a limited area, especially by some organic producers who use it to supply nitrogen to their crops. The small seed size and low seeding rate (40 kg/ha) make it the least cost annual legume green manure crop for the northern Great Plains, including Montana and North Dakota.

The second niche market lentil variety was CDC Gold, a zero tannin lentil registered in 1993 and released exclusively to the Saskatchewan Wheat Pool. The seed coat of CDC Gold lentil is white and turns translucent when cooked, showing the golden cotyledon - thus, the name CDC Gold lentil. This is a new type with no known market, but it should find a place in premium quality products such as instant lentil soup or in lentil soup canned in glass jars in Spain. Due to the absence of tannin precursors in the seed coat of CDC Gold lentil, the soup retains a clear colour, rather than turning dull grey as with standard lentils. This, in itself, should stimulate interest in its use in exclusive pulse products. CDC Gold is ascochyta susceptible and low yielding, but higher yielding, ascochyta resistant varieties are being developed and should be available as soon as CDC Gold has proven that the zero tannin lentil has a place in the market.

The third niche market lentil variety is CDC Matador, an ascochyta resistant, Spanish brown type lentil released in 1994. The original Spanish brown lentil, Pardina, is ascochyta susceptible, short, lodges badly and Saskatchewan lentil producers refused to grow it after their first attempt. Currently, about 6,000 ha of Pardina lentil are grown in northern Idaho and eastern Washington where ascochyta rarely is a problem. CDC Matador lentil should help Canada compete in the Spanish brown lentil market. CDC Matador produces seeds with a high frequency (5-10%) of black seed coats due to a somatic mutation (seed coat only). The seeds with black seed coats produce plants bearing typical Spanish brown type lentils. Nevertheless, CDC Matador seeds will require colour sorting, before they are exported to Spain.

A fourth niche market pulse is a large-seeded faba bean registered in 1994. It is high yielding and should find a niche market in Egypt where they consume large quantities of large-seeded faba beans. Time will be required to determine the size of the market for this size of faba bean.

Two early maturing black beans were registered by the CDC in 1994. The earliest one is more than a week earlier maturing than the first Canadian black bean variety Loop and still yields competitively with Loop black bean. South and Central America import large quantities of black beans and these two varieties show much promise for the

northern fringe of the bean growing area, as well as for replanting damaged crops in the main bean producing areas of the northern United States.

Two Austrian winter (spring-seeded) or Maple type peas were also registered by the CDC in 1994. They are high yielding and have short vines. One has green cotyledons and one has yellow cotyledons. One or both have potential for pigeon feed (so-called "pigeon" peas), as well as an extender for an paste in Japan. However, these markets will have to be developed since these peas differ somewhat from the traditional Austrian winter peas and the maple pea.

The CDC is also registering a small-seeded ascochyta-resistant red lentil in 1994. If it can be split efficiently, it has the promise of becoming a mainstream type variety grown on up to 40,000 ha. It may well justify construction of the first commercial lentil splitter in North America by the time commercial seed becomes available in the fall of 1997.

Three marrowfat pea varieties were registered in 1994, two by a company in Alberta and one by a company in Manitoba. Marrowfat peas are a specialty item exported under exacting standards to Japan where they are roasted and eaten as a snack food. Much of this roasted marrowfat snack food is re-exported around the world, including Canada, at high prices. Someday soon, some of these marrowfat peas will be roasted in Canada and eaten here.

Another niche market pea is the red cotyledon pea. It is being tendered by the CDC in 1994 and will be grown under contract registration. It will be split in western Canada and the red split peas used in dry soup mixes to add a bit of colour. This marketing approach has been used successfully in the United States with whole, decorticated, large-seeded lentils. This should also work with red split peas, especially since peas are much less expensive than lentils. The company that gets this tender will have a chance to test this premise. Incidentally, red peas and lentils turn yellow when cooked.

FUTURE PROSPECTS

Plant breeding is a long process, requiring 8 to 15 years between the time a cross is made and the time when the resulting new variety has been developed and registered. Thus, in an established breeding program new crosses are made each year and improved lines from crosses made 8 to 15 years earlier are being released if worthy or discarded if unworthy. In other words new potential varieties are coming out of the plant breeding pipeline each year. Accordingly, a series of mainstream and niche market type pulse crop varieties are scheduled for in the next few years, as follows:

1995

- Ascochyta susceptible desi chickpea (for market development)
- Improved French green lentil
- Green cotyledon lentil

1996

Marrowfat pea
Ascochyta resistant desi chickpea

1997

Early maturing, white pea bean
Early maturing, direct cut type pinto bean
Ascochyta resistant Laird-type lentil
Bleach tolerant, dry green pea

1998

Ascochyta resistant, zero tannin lentil
Early maturing great northern bean
Early maturing small red bean
Early maturing pink bean

1999

Ascochyta and anthracnose resistant Eston-type lentil
Ascochyta resistant, early maturing, kabuli chickpea

SUMMARY

In summary, the future trends in the pulse crop industry are:

1. More niche market pulse crop varieties will become available.
2. Most varieties will be exclusive releases and will be grown under contract.
3. The desi chickpea industry will develop rapidly.
4. The dry bean industry will grow rapidly in Saskatchewan following development of direct-cut type varieties with pods higher up the plant and a modified cutterbar to further reduce direct cut harvest losses.
5. Fewer and larger pulse processing plants will be concentrated on the mainline railroad tracks.
6. A dedicated lentil splitting plant will be constructed in Saskatchewan.
7. A domestic feed pea industry will be developed using pea or a pea-canola mixture to replace soybean meal as the protein source in the ration.

Postscript:

Plant breeding requires a major commitment of time and money on a continuing basis. Support by the Saskatchewan Pulse Crop Development Board, Saskatchewan Agriculture Development Fund, Western Grains Research Foundation and the Natural Sciences and Engineering Research Council (NSERC) is gratefully acknowledged. Special efforts are being made to institute an Industrial Research Chair in Pulse Crop Breeding and Management at the University of Saskatchewan. This requires financial support for a five year term from all aspects of the pulse crop industry which then qualifies for matching funds from NSERC. This Industrial Research Chair will then provide continuity to this program and ensure that these mainstream and niche market type pulse varieties become available quickly for the benefit of Saskatchewan farmers and the Saskatchewan economy in general.