

PRODUCTION STRATEGIES FOR ZERO TANNIN FABA BEAN IN ALBERTA TIPS ON GROWING YOUR FIRST CROP!!

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Introduction

The large potential of the new zero tannin faba bean (variety “Snowbird”) is mainly as a feed for swine and meat poultry. Faba bean is grown in areas of Alberta receiving sufficient rainfall and cooler summer temperatures. The main areas of adaptability include the Parkland and the Peace regions. However, faba bean will grow in all parts of Alberta but cannot compete, \$\$\$wise, with field pea production in the east half of Alberta due to field pea showing a higher water use efficiency (WUE) and field pea has the ability to handle higher temperatures during the flowering period compared to faba bean crops. Field pea also has a human grade market with higher prices compared to the local feed market price. Alberta Agriculture-Ag Research Division initiated research in 2004 to validate the potential in the livestock industry and the production potential of faba bean in Alberta. The comments made in this article are referring to data obtained in this research. Faba bean is a cool season pulse crop!!! Drought and heat stress can devastate a faba bean crop.

REMEMBER—Have a market and a buyer for your faba bean crop before you start.

**What is this new zero tannin faba bean?**

In the 1970's normal high tannin (10% or higher seed tannin levels) was grown as a silage protein crop (for cattle) and YES some was even marketed to Egypt and other countries for human consumption Grade #3 or better. Zero tannin (less than 1% seed tannin level) is now available which can be directly processed and fed to swine and meat poultry. Tannin types cannot be fed at high levels to these livestock. These older tannin types originated from Europe (Germany and The Netherlands) and tannin types are still grown as a livestock feed in Europe because most of the feed is pelletized and the heat in pelleting destroys the tannin problem. The feed quality of zero tannin faba bean is excellent and the production factors for this crop are quite simple and easy to obtain.

“Snowbird” faba bean

- Is a medium maturing cultivar (110-120 days to maturity) based on early seeding
- Seed size is approximately 550grams/1000 seeds (about 2 times larger than normal field pea seed size). Large seed can cause seed drill and seeding problems. This large seed requires better soil moisture conditions to germinate.
- Emergence occurs about 16 to 21 days after seeding (depth and seed bed moisture dependent)
- Flowering starts at about 35 to 40 days after emergence (50-55 days after seeding)
- Flower color is totally white with no black or purple marking as occurs with normal tannin types
- There are 6 flowers per flowering node and usually 6 to 8 flower nodes if drought and heat stress are absent. This results in up to 36-48 potential pods BUT usually only half or less will self pollinate and form pods.
- Maturity begins in mid August with first sign of yellow to tan brown color of lowest (first formed) pods. There is always a maturity difference from lowest to top pods. We are most interested in first formed pods. The latest most immature pods may not develop full seed in a short year.
- Standability of faba bean is excellent so swathing is not recommended. We have seen faba bean straight cut harvest occur in November with up to 15cm (6 inches) of snow on the ground. Lazy faba bean stems which can cause lodging are usually due to excess rainfall and high soil nitrogen.
- For seed production, care in combining and handling of this large seed crop is necessary to avoid seed cracks which lower germination and vigor.

Field Choice and Soil Effects

Select fields that had pre harvest glyphosate application last fall to control perennial weeds. Since water may become the limiting factor for high yields, avoid soils which are sandy and choose soils with good moisture holding capacity. Residual broad leaf herbicides from the previous year will affect all pulse crops including faba bean. Refer to the AAFRD “Blue Book” before choosing a field for faba bean. Besides the herbicide residue issue, the main field choice should be based on the lowest soil nitrogen (N) test levels. Remember, faba bean is the highest nitrogen fixing crop but the amount fixed will be lower as the soil test nitrogen level increases. Normally soil test nitrogen levels should be below 35kg/ha (30lb/ac) for the 0-12 inch soil test. High soil N is also found on manured fields, so stay away from manured fields for at least 2 years before faba bean production. High soil nitrogen will result in excessive plant growth and plant height, later flowering, later maturity and lower yield and poorer seed quality. Avoid growing faba bean on peat soils and soils with an extreme topography variation- these choices result in later and uneven crop maturity.

Seed and Seeding Issues

Faba bean must be seeded early: seed faba bean fields FIRST before seeding other crops. One week later seeding in the spring can result in a 2 to 3 week later maturity in the fall resulting in frost damage and a very slow dry down crop. Faba bean is a LARGE seed so seed and seed drill issues are real and it is very important to achieve a target plant population of 4 plants/sq. ft. (45 plants/sq. metre). Zero tannin cultivars are poorer in fighting seed disease problems because of the reduction in the tannin content which has natural fungicidal properties. Seed treatment is encouraged because of the low tannin, required very early seeding dates, and deeper seeding due to the large seed size. For Snowbird, with a seed size of 550grams/1000seeds, and a per cent germination of 90% and no reduction due to drill cracking or splitting of the seed, you will still need 244 lb/ac (111 kg/ac) of seed for the target plant population of 4 plants/sq. ft. (45plants/sq. m.). With this large seed, care must be taken to ensure the drill or air seeder is capable of handling 244 lb/ac at a reasonable ground speed and avoid any plugging or cracking of the seed. Remember cracked seed does not produce plants.

The main fertility requirement is phosphate and our studies show that 20 lb/ac of actual phosphate (approximately 50 lb/ac of 11-48-0) in the seed row has increased yield. Higher rates of phosphate are not necessary unless your soil tests are showing very low soil phosphate levels.



Nitrogen is to be avoided (remember stay away from high N soils). Proper rhizobium inoculation of the seed or use of granular inoculant is critical. Remember research has shown that granular inoculant is equal to or better than peat based inoculant which is equal to or better than liquid inoculant. CHECK with your inoculant rep for faba bean inoculant and order early. Always use inoculant with the words faba bean on the bag!!!!

Weeds and Other Pest Management Issues

Registered herbicides are available for faba bean production. Fall soil incorporated Edge or Treflan -(with Sencor) and spring application of these products is registered. Fall application is preferred. For broadleaf post emergent weed control, the only registered product is Basagran. For grassy weeds there are several choices. From our herbicide tolerance trials with faba bean (an ACIDF project), we are applying for minor use registration of Pursuit Ultra (Pursuit + Poast) and Odyssey. We hope this will be approved for 2007 use????

The main in crop diseases are sclerotinia and chocolate spot. Proper crop rotation and control of mustard type weeds is the best system to control sclerotinia. Chocolate spot has no economical control measures to date as this disease occurs later in the season and does not seem to reduce yield. Faba bean ascochyta is found but again we have not seen economic losses to date and hope this continues.

Insect damage on faba bean includes grasshoppers, blister beetles and of course LYGUS bug. Lygus bug is the main insect causing seed perforations and reducing the Grade for any human consumption product. Again there are no threshold levels and no economic examples of control but there are registered insecticides for use on faba bean. Consult the AAFRD "Blue Book" or discuss with your chemical rep.

Harvest Management

In the Westlock- Barrhead area, the maturity of Snowbird has resulted in pre harvest and Reglone desiccant applications applied in the September 1st to Sept 10th period (or earlier on a dry hot year like 2006) based on late April to May 5th seeding dates. Pre harvest glyphosate is registered for faba bean but the desiccant Reglone is not. We have applied for minor use registration of Reglone and we are hopeful that this product is registered for the 2007 harvest. Of note, both products tested work much better prior to a killing frost so the September 1st -10th window seems to work best. Time of application is when maturity (tan to black color) of lower pods is visible but prior to frost. This would result in combining about 3 weeks later. The dry down process of this crop takes longer than for field pea due to the larger and more fibrous stem as well as the larger seed.

One advantage of pre harvest glyphosate application is that the systemic will kill the plant and eliminate any secondary tillers forming in September if rainfall occurs. Faba bean stands well so swathing this crop is not an option unless you are making silage! We have seen fields left over winter due to swathing and the build up of moulds on the seed reduces faba bean value as a feed.

Combining and Post Harvest

Straight cut or direct harvest systems are the choice for faba bean. Due to the large seed size, wires should be removed in the concave to allow clearance for seed to pass through without damage. This large seed allows for high wind, and more open concave and screen settings. The result should be a clean sample with no cracked seeds. The use of lifter fingers is not necessary and if you are getting shattering at the cutter bar, there is a good chance that the shattering is occurring due to the lifter finger hitting the stem and causing the pods to open before the stems are cut.

This large seed allows maximum air flow in an aeration system and harvesting at seed moistures of 18 to 20 per cent is possible as long as the sample is clean and not full of green weed seeds etc. Dry for faba bean is 16.0% moisture and moisture charts are available for this crop. Remember you are dealing with a large seed so extremely dry faba seed or aggressive augers will cause seed damage and reduce germination and vigor.

**Summary-- Faba Bean Production Tips**

- To date, markets for zero tannin faba bean are: feed only—your own feed market, the neighbor's hog operation or the feed mill.
- Choose a field with no perennial weed problems-last fall pre harvest fields
- Do not seed faba bean on high nitrogen (manured) fields
- Fall or spring pre plant Edge or Treflan works well
- Check that your air seeder or drill can handle this large seed without plugging
- Seed faba bean FIRST before other crop seeding
- Seed into moisture (minimum of 4cm (1 1/2 inch) seed depth or deeper if necessary. Watch for seed cracking in the air seeder or drill
- You need about 240 lb/ac seed rate for a stand of 4 plants/sq. ft.
- Proper inoculant and a small amount of phosphate is your total fertilizer for most fields
- Basagran is registered for in crop broadleaf weeds and grassy products work well
- Watch for insect and disease problems
- Late August to early September—get ready for pre harvest weed control or desiccate with Reglone (if registered)
- Straight cut/direct combining only-do not swath! Remove concave wires
- Combining seed moisture 18-20% Watch for cracked and damaged seed
- Aeration after combining down to dry (16% moisture).



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