



## Bean Agronomy Network~ Partnership in Industry

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### 1. Fertilizer Management of Dry Bean in Southern Alberta

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**Nitrogen:** Southern Alberta research has shown that optimum yield was generally achieved when the soil N in the 0-12 inch depth plus fertilizer N totaled between 100 and 120 lb N/ac. Nitrogen fertilizer recommendations have been developed for soil testing labs, fertilizer dealers and farmers to fine tune nitrogen fertilizer recommendations.

**Phosphorus:** The response to phosphorus fertilizer is generally small, usually due to higher soil test P levels in irrigated soils. However, phosphorus is very important in bean production, and a maintenance application may be beneficial. Broadcast-incorporated rates should be increased by 1.5 to 2 times of banded.

**Potassium:** Beans have a higher requirement for potassium than cereal crops and require almost as much potassium as nitrogen. Only 20-25% of the plant K is translocated to the seed, while the rest is in the leaves and stems, which are normally returned to the soil. Many southern Alberta soils are medium to high in exchangeable potassium, often ranging from 400 to 1000 lb of K/ac in the 0-6 inch depth of soil. When soils test greater than 300 lb K/ac, potassium fertilizer is not required for beans. Generally, K deficiencies are most likely to occur on intensively cropped sandy soils. When potassium fertilizer is required, banding K is more efficient than broadcasting.

**Sulphur:** Sulphur (S) deficiencies are rarely a problem on irrigated soils in southern Alberta. Irrigation water normally contains enough sulphate sulphur to meet crop requirements. If soil S levels were less than 20 lb/ac in the 0-12 inch depth you would need to apply some S.

**Micronutrients:** Beans require all the essential micronutrients.

**Zinc (Zn)** has been identified as being occasionally deficient and only on coarse textured soils. On medium to fine textured soil types, zinc is not recommended above a critical level of 1.5 ppm. Between 1.0-1.5 ppm, 3 lb of soil applied Zn/ac is recommended, and below 1.0 ppm, 5 lb of soil applied Zn/ac is recommended. On sandy soils (sandy loam to loamy sand), zinc is not recommended above a critical level of 3.0 ppm. Between 1.5-3.0 ppm, 3 lb of soil applied Zn/ac is recommended and below 1.5 ppm, 5 lb of soil applied Zn is recommended. Banding the zinc before or at the time of seeding is the preferred method of application. However, soil applied zinc sulphate could be substituted for one or two foliar applications. Zinc deficiency can be partially induced by cool, wet soil conditions, which may reduce soil zinc availability to the crop. Beans grown in soils that have soil test Zn levels above the critical level may still show visual symptoms of Zn deficiency during wet, cool conditions in June. Beans will often grow out of the deficiency as the weather warms up. However, if cool weather conditions are prolonged, a foliar application could result in a yield benefit.

**Boron (B)** and beans in southern Alberta did not result in improved crop growth or yield. In fact, several locations resulted in a 5 to 15 per cent bean yield reduction to a 3 lb B/ac banded application. Even small applications of B can be potentially toxic to a sensitive crop like beans.

**Links:** "*Nutrient management of dry beans in southern Alberta*". The link to the factsheet is: [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex116?opendocument](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex116?opendocument)

**"How to management soils or fields that are blowing".**

[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex3524?opendocument](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex3524?opendocument)

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