Fluid Fertilizer Foundation

# Fluid Facts

## MICRONUTRIENT RESPONSE ENHANCED

*Numerous studies have documented crop responses to N, P, K, and S in starters. But micronutrients have received less attention as components of starter applications. Opportunities exist to improve crop response to micronutrients by combining them with starter fertilizer applications. Starters can improve early growth and root development, hasten maturity, and improve yields under a variety of conditions. Crops planted early in cool soils particularly seem to benefit from starters.*

### Summary Points

*Studies have demonstrated improved micronutrient response in starters for a variety of reasons. Under soil conditions that potentially reduce nutrient availability from broadcast fertilizers, starter applications may:*

1. *Produce superior micronutrient response by concentrating nutrients in a band where probability of root interception is greater. Root interception is a critical factor in uptake because several of the micronutrients are immobile in soils.*
2. *Produce root exudates that enhance nutrient availability. Many plants secrete compounds from their roots that can solubilize unavailable micronutrient compounds and increase uptake.*
3. *Place nutrients in a chemical environment that favors less rapid fixation*

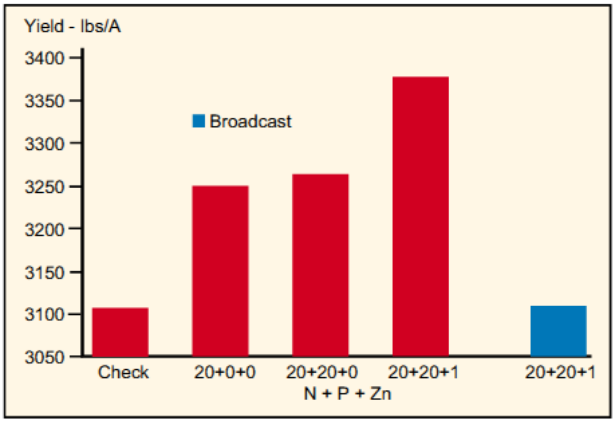


Figure 1. Yield and maturity response of dry beans to starter fertilizer applications, average of two years (1994-1995), two cultivars, four planting dates and four replications.

### Conclusions

*Fluid fertilizers offer special advantages in enhancing micronutrient availability. Because micronutrients are used at low rates distribution in the soil is poor. Fluid bands enhance micronutrient distribution because they are:*

1. *More or less continuous*
2. *Provide better (even) distribution*
3. *Generally eliminate spaces occurring between (dry) granules.*

*It has been proposed that much of the advantage of chelated and complex forms applied in fluids results from superior distribution and root interception in addition to nutrient chemistry. Zinc sources banded in suspension with ammonium polyphosphate suspensions have been studied. Suspending zinc materials in fluids produced similar responses among products, eliminating the disadvantages of the insolubility of some zinc carriers such as zinc oxide.*

*A variety of fluid carriers may be used, but compatibility should be checked and the final solution grade may be limited by the compatibility of the carriers. Polyphosphates are essential for sequestering many inorganic micronutrients.*

### Article Credit

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*Full paper is available from the Fluid Journal archives:*
*http://www.fluidfertilizer.com/PastArt/2002.htm*

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