A Novel Approach to Soybean Fertility

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AgriEnergy Resources has long promoted banding fertilizer and using biological products to boost fertilizer use efficiency. That combination has a long, proven track record for growing corn. Many growers have found they can get excellent corn yields even on low fertility soils, by banding phosphorus and potassium with the corn planter and sidedress application

A number of Indiana growers have been using those same concepts for their soybean fertility program and are seeing excellent yields as a result. Many are growing 70 plus bushel beans on light soils testing low in phosphorus and potassium. They are using a "stream application" during the growing season. For most growers, it involves using StreamJet nozzles on their sprayers to apply in dribble bands 7 inches apart (pictured).

Here's a close-up of the most commonly used Tee Jet SJ 3 Stream Jet nozzle. Although, some growers will be placing fertilizer beside the row this year with Y-Drops instead of using the stream nozzles.

The target application time frame would be from V5-R1, trying to get fertilizer applied just ahead of flowering. Here are ranges of products being applied in the stream application.

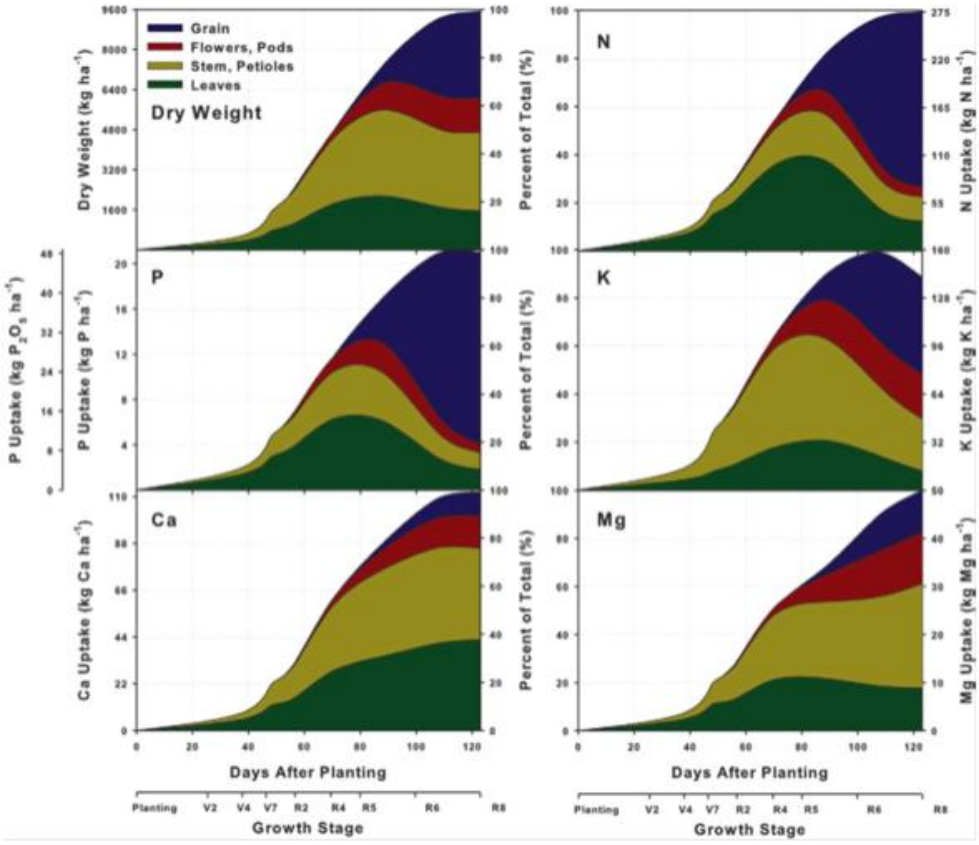
- **SP-1™:** 3-4 gal/a

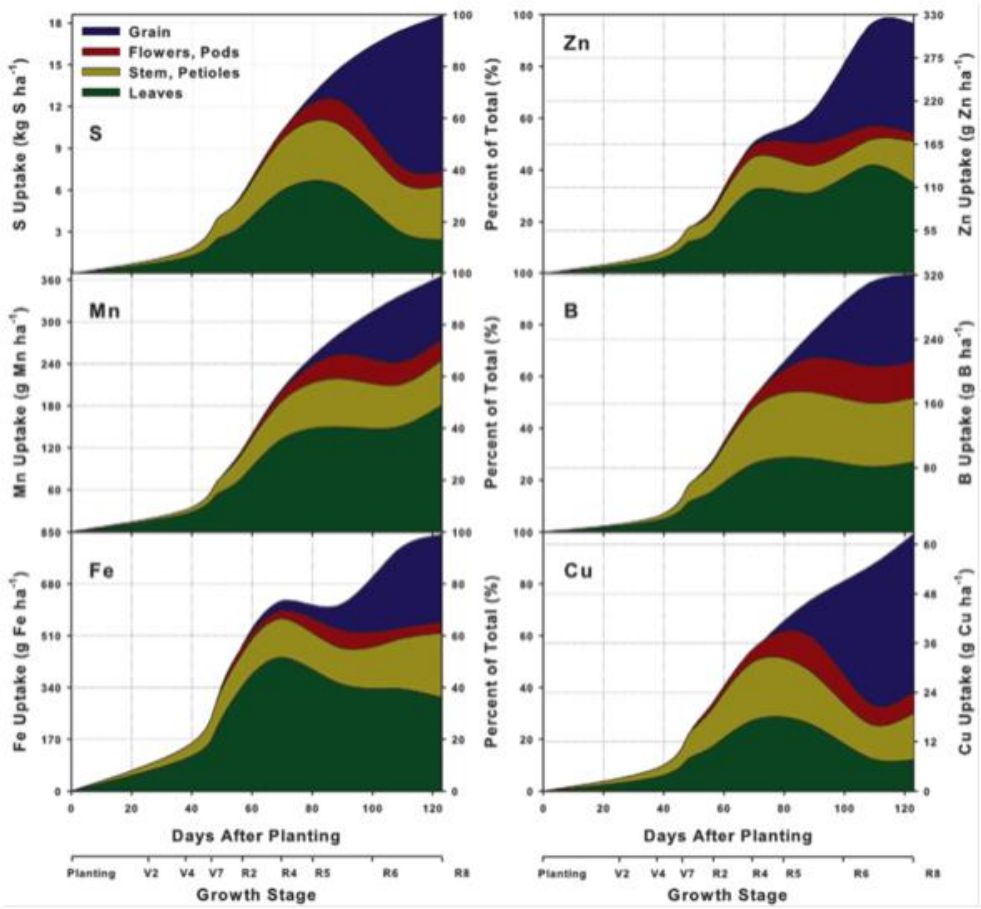
- **4-21-4 or AgriBoost PK:** 0-5 gal/a
- **KTS Potassium ThioSulfate 0-0-25-17S:** 4-8 gal/a
- **Trace Pak:** .5 gal/a
- **Corn Syrup:** .5 gal/a

Why are growers seeing success with this practice? We think the following reasons partially explain its success:

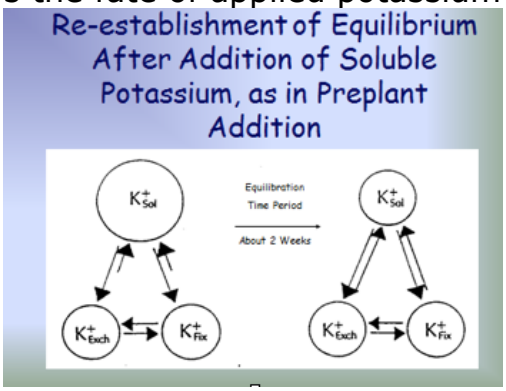
- We know a lot of growers haven't done much with soybean fertility in the past, even though they have low fertility levels. This program addresses fertility in the soybean crop.
- Banding increases fertilizer use efficiency. Why not extend this to the soybean crop?
- Unlike corn, soybeans can withstand stress and lower nutrient levels early in the season and still yield well. Therefore, the timing of application may be a real key here.

Look at the nutrient uptake curve on the charts below. The charts are from a paper published by Ross R. Bender, Jason W. Haegele and Frederick E. Below. They illustrate that rapid nutrient uptake happens from the late vegetative stages through seed development.





The delayed timing of application allows less time for the nutrients to be tied up in the soil before being taken up by the plant. The band application further reduces the chance for tie up. The following illustration shows the fate of applied potassium and its tendency to be tied up by the soil over time.



Potassium availability is greatly influenced by soil tilth. It is not readily available in tight soils lacking oxygen. We've observed that fields, where **SP-1™** was banded in the row, improved soil tilth compared to untreated areas. We are seeing the same thing with the stream applications.

The organisms in **SP-1™** are also helping with nutrient cycling in the soil.

Looking at the sharp uptake of curve of potassium and sulfur, we think the KTS is a vital component of this system. AgriFood Labs has stated, "There is a positive relationship of K in the soybean leaf and yield. We can explain 32% of the soybean yield by the K content in the most recently matured trifoliate leaf just before growth stage R 5.0".

Putting it all together, we're just taking advantage of proper timing and placement of liquid fertilizer, combined with biology, to gain greater fertilizer use efficiency providing key nutrients to the plant at a critical time.

One of the potential pitfalls of surface banding fertilizer would be the inability to move the nutrients into the soil where they can be utilized without adequate rainfall after application. Under dry soil conditions, it would be advisable to use a product like Oro RZ, or another adjuvant, to help move nutrients into the soil profile. Oro RZ is designed for the uniform distribution of soil applied nutrients.

While we don't have all of the answers about in season stream applications of nutrients on soybeans, we have seen enough good results to know that this is a practice that deserves more consideration.

Is this one practice that can help take your soybean yields to the next level? *Talk to your AgriEnergy representative about a program that makes $ense for you.*