

Soybeans have a high profit potential. Since approximately 90% of production costs for soybeans are incurred at the **30 bushel** yield level, growers should be able to economically fertilize for maximum yields. Fertility programs based on plant analysis and soil analysis from TPSL<sup>®</sup> will maximize mineral efficiency.

SEASON REQUIREMENTS					
Yield Bu/Ac	N Nitrogen lbs/ac	P <sub>2</sub> O <sub>5</sub> Phosphorous lbs/ac	K <sub>2</sub> O Potassium lbs/ac	Mg Magnesium lbs/ac	S Sulfur lbs/ac
50	270	55	120	25	21
75	405	83	180	38	32
100	540	110	240	50	42
125	675	138	300	63	53
150	810	165	360	75	63
200	1,080	220	480	100	84

**Note:** The above is to be applied in increments according to a *schedule!*

**Note:** The timing of the applications is *crucial!!!*

**Note:** The use of certain adjuvants may *significantly reduce* some of these requirements.

**Plant Food Utilization:**

Adequate nodulation can supply a good portion of N. Efficiency of N and P used by the first crop is small, as soybeans are poor feeders – only 10 - 20%. Mixing humus products and Sulfur into the soil weeks before planting may be beneficial. --- K uptake is about 50 - 70%.

**By supplying the nutritional needs required by your soybeans' stage of growth,  
You can dramatically increase your yields and quality,  
AND**

**Greatly reduce water requirements and eliminate the costs of unnecessary fertilizers!**

Soybeans absorb approximately 40 to 45% of their total N, P & K at the beginning of bean formation, when the vegetative plant parts have reached their maximum content. All of these nutrients go into the seed because the grain contains approximately 70% N, 75% P, and 55% K of all the nutrients absorbed.

During the first month of planting, daily nutrient uptakes are small – much less than 1 lb./acre/day. In the second and third month, the daily nutrient requirement can reach 8 lbs. Nitrogen, 0.40 lbs. Phosphorous, and 4 lbs. of Potash.

At soybean yields of 30 to 70 bushels/acre, 1/3 to 1/2 (yields above this are proportionately higher) of the Nitrogen absorbed by the plant is in the form of nitrates and ammonium ions. Preplant Nitrogen is recommended depending upon soil analysis results. Phosphate and Potassium should be included with nitrogen soil applications. Since peak Nitrogen uptake corresponds with pod set and seed filling, supplemental Nitrogen is recommended during these stages of growth.

High levels of available Phosphorous are associated with high soybean yields. The greatest demand for Phosphorous is at mid-bloom and mid-pod set. Phosphorous is required for normal Nitrogen fixation. Average mineral recovery from fertilization under good conditions ranges from 10 to 20%. TPSL<sup>®</sup> has successful in increasing this percentage, especially in drip and pivot irrigation, by using adjuvants such as humic acid, sugars, beneficial soil bacteria and other things.

Soybeans also require large amounts of Potassium. Maximum need is associated with periods of vegetative growth. Potassium can increase the number of nodules which actively fix atmospheric Nitrogen. Average recovery for a Potassium application is 50 to 70%.

The availability of soil nutrients, with the exception of Nitrogen, is basically pH dependent. The pH dictates the complexing, precipitation and solubility of various mineral compounds. Optimal soil pH is between 6.10 to 6.70. If the soil pH is increased from 5.10 to 6.10, soybean yields can increase by 8 bushels/acre.

Very small amounts of Molybdenum (Mo) are required by soybeans for Nitrogen fixation. At pH levels below 6.00, Molybdenum is frequently so unavailable that supplemental applications to seed or foliage will sharply increase yields.

Depending upon your soil's chemistry, most nutrients can be rapidly "tied-up" into **plant-unavailable** (insoluble) compounds!

It is only the **plant-available** nutrient compounds – available **when** the plants **need** them - that count!

Most all other soil tests report at least some amount of those "tied-up / plant-unavailable" compounds, giving you a false sense of adequacy – **even as your plants show obvious signs of distress and decline!**

This hopefully explains why your plants clearly show certain nutrient deficiencies, even though your soil test reports come back showing those nutrients as being adequate or high! **All of this can be avoided!**

Under favorable conditions, only 25 to 50 percent of soybean flowers effectively fertilize and set pods. If conditions are not good, most early flowers and pods abort.

Weed control is critical in the production of soybeans. Grasses [weeds] are much better competitors for P, K, Ca and Mg, and will rob the soil of nutrients required for optimal production. In addition, there is good evidence that plants [weeds] volatilize excess Nitrogen through their leaves. *Palmers Amaranth, Jimsonweed* and *Entireleaf Morning-Glory* volatilize 5 to 10 times more Nitrogen into the atmosphere, than do soybeans.

In addition, since young soybean leaves volatilize high amounts of Nitrogen, succulent vegetative growth would be associated with higher nitrate loss than slow growth. Hence, high amounts of **Nitrogen** applied at early stages of growth will be mostly **lost**.

### Plant Sampling

Sample the most recently matured leaf near the top of the plant. Keep both the petiole and leaf for the sample.

Approximately 25 to 35 leaves are needed for one sample. Repeat sampling every 10 days. Only paper, **not plastic**, bags should be used. Samples should be taken from early growth to pod development. Please submit samples along with a Plant Analysis Field Information and Submittal Form which can be obtained from the website, [www.AskThePlant.com](http://www.AskThePlant.com).


Samples can arrive in one day if sent by Fed-Ex, UPS, USPS Express, etc. Complete analysis takes 24 to 48 hours after the sample is received by the lab. TPSL® will e-mail you your report along with detailed recommendations.

For soil, water and all other testing, see:

[www.TexasPlantAndSoilLab.com](http://www.TexasPlantAndSoilLab.com).

## SOYBEANS DRY BEANS

*1st to 3rd trifoliolate:* Cut plant 1 inch above surface and submit entire plant. Sample 25 plants.



*Early bloom to podset:* Submit first fully developed trifoliolate leaf from top. Sample 25 plants.

