



**WWW.MSSOY.ORG ⇒ MSPB WEBSITE WITH
UP-TO-DATE SOYBEAN PRODUCTION
INFORMATION**

NUTRIENT SUFFICIENCY FOR SOYBEANS FACT SHEET

This is one in a series of fact sheets from the Mississippi Soybean Promotion Board and the soybean checkoff. Each sheet presents a brief overview of a topic important to Mississippi soybean production. More information on each topic can be accessed through the link at the bottom of the sheet. To see other fact sheets, click [here](#).

Producers use soil testing to inform them of how much of the 16 essential nutrients are in their soils. Most soil test results provide information about the amount of the major [Phosphorus (P) and Potassium (K)] and secondary [Sulfur (S), Calcium (Ca), and Magnesium (Mg)] macronutrients that a soil sample contains, but likely do not provide information about the amount of micronutrients in the sample unless the submitting producer requests that and pays an additional testing fee.

Knowing just how much of a particular nutrient is in the soil is of value, but knowing the amount of each nutrient in the soil or tissue in relation to its sufficiency for optimum soybean yield is the most valuable information.

If nutrient deficiency symptoms appear in growing soybean plants, tissue testing is a verified way of determining the level of a particular nutrient in the plant in order to discern if in fact a particular nutrient is deficient in the plant exhibiting symptoms. This will allow a producer to plan for remedial soil fertilization measures that will prevent recurrence of a deficiency in subsequent crops. Foliar fertilization to remedy an in-season deficiency is not recommended, especially since leaves do not readily absorb foliar-applied nutrients in an amount that will remedy most deficiencies.

The information in the below table is a compilation of soil and tissue sufficiency levels of each nutrient that are deemed necessary to produce a soybean crop. These data are gleaned from myriad sources which each have some if not all of the information shown in the table. Thus, the table values may not exactly match those in specific sources, but rather are a reasonable “putting together” of information from those myriad sources.

Soil and tissue sufficiency levels for soybean essential nutrients (soil levels in lb/acre are approximate amounts in top 6 in. of soil). Tests for soil micronutrients are not as precise as those for soil pH, P, and K.			
Nutrient/Element	Soil level^a	Tissue levels^b	
		Critical level	Sufficiency range
Phosphorus (P)	40-60 ppm; 80-120 lb/acre	0.25%	0.26-0.60%
Potassium (K)	130-175 ppm; 260-350 lb/acre	1.70%	1.71-2.50%
Sulfur (S)	>10 ppm; >20 lb/acre	0.20%	0.21-0.60%
Calcium (Ca)	>400 ppm; >800 lb/acre	0.79%	0.80-1.40%
Magnesium (Mg)	>30 ppm; >60 lb/acre	0.25%	0.26-0.70%
Manganese (Mn)	>40 ppm; >80 lb/acre	20 ppm	21-100 ppm
Boron (B)	NA	20 ppm	21-60 ppm
Copper (Cu)	>1 ppm; >2 lb/acre	9 ppm	10-30 ppm
Molybdenum (Mo) ^c	---	0.9 ppm	1.0-5.0 ppm
Zinc (Zn)	4-8 ppm; 8-16 lb/acre	20 ppm	21-60 ppm
Iron (Fe) ^c	---	50 ppm	51-300 ppm
Chlorine	Not established		

^a1 ppm = ~2 lb/acre in top 6 in. of soil. ^bAssumes correct plant part sampled at correct stage.
^cSoil tests for iron and molybdenum are considered to be of little value in predicting supply of these nutrients in soil.
 NA = data not available.

For a detailed discussion of this topic, click [here](#). Click [here](#) for a White Paper that discusses foliar fertilization.

*Composed by Larry G. Heatherly, Updated Aug. 2020,
larryheatherly@bellsouth.net*