

MSU Soil Testing Laboratory announces new potassium recommendations for soybean

Thanks to the efforts from our soil scientists and graduate students with backing from the Mississippi soybean promotion board, we have sufficient data to support changes in MSU soil testing’s soybean potassium recommendations. Currently soil samples are categorized into one of 5 categories (Very Low to High) based on extractable potassium level and CEC (Table 1). From the assigned category, samples are given a fertilizer recommendation (Table 3). Samples that are categorized as “Very Low” will remain at 120 pounds per acre of K2O. All samples that are categorized “Low” will now receive a recommendation of 90 pounds per acre (previously 60). Samples that are categorized as “Medium” will continue to get a recommendation of 60 pounds per acre. No fertilizer recommendations are given for samples in the “High” or “Very High” categories. As an example of how this change might impact a sample recommendation, under current recommendations soils testing at 250 pounds per acre extractable K with a CEC of 30 would be classified as a High rate and thus not get a potassium recommendation. Data from Dygert (Figure 2) suggests this is not sufficient, and additional K would trigger a yield response. A minimum of 250 pounds per acre of extractable K is required for K to not be a limiting factor in soybean yield. Additionally, data from research trials conducted from 2011-2019 in the Delta area of MS suggests that when soil test values are in the responsive range, 80 pounds per acre of K2O are required to maximize agronomic yield of Soybean (Figure 1). Therefore, beginning January, 2020, soybeans will move to groupings with a lower threshold to trigger a potassium rate recommendation (Table 2). In addition, soybean recommended rates for K2O fertilizer in the Low category will change (Table 3). In making these changes we hope soil testing recommendations will assist producers in optimizing fertilizer rates toward reaching yield goals.

Table 1. Current Soybean Potassium groupings based on soil test extractable K in pounds per acre

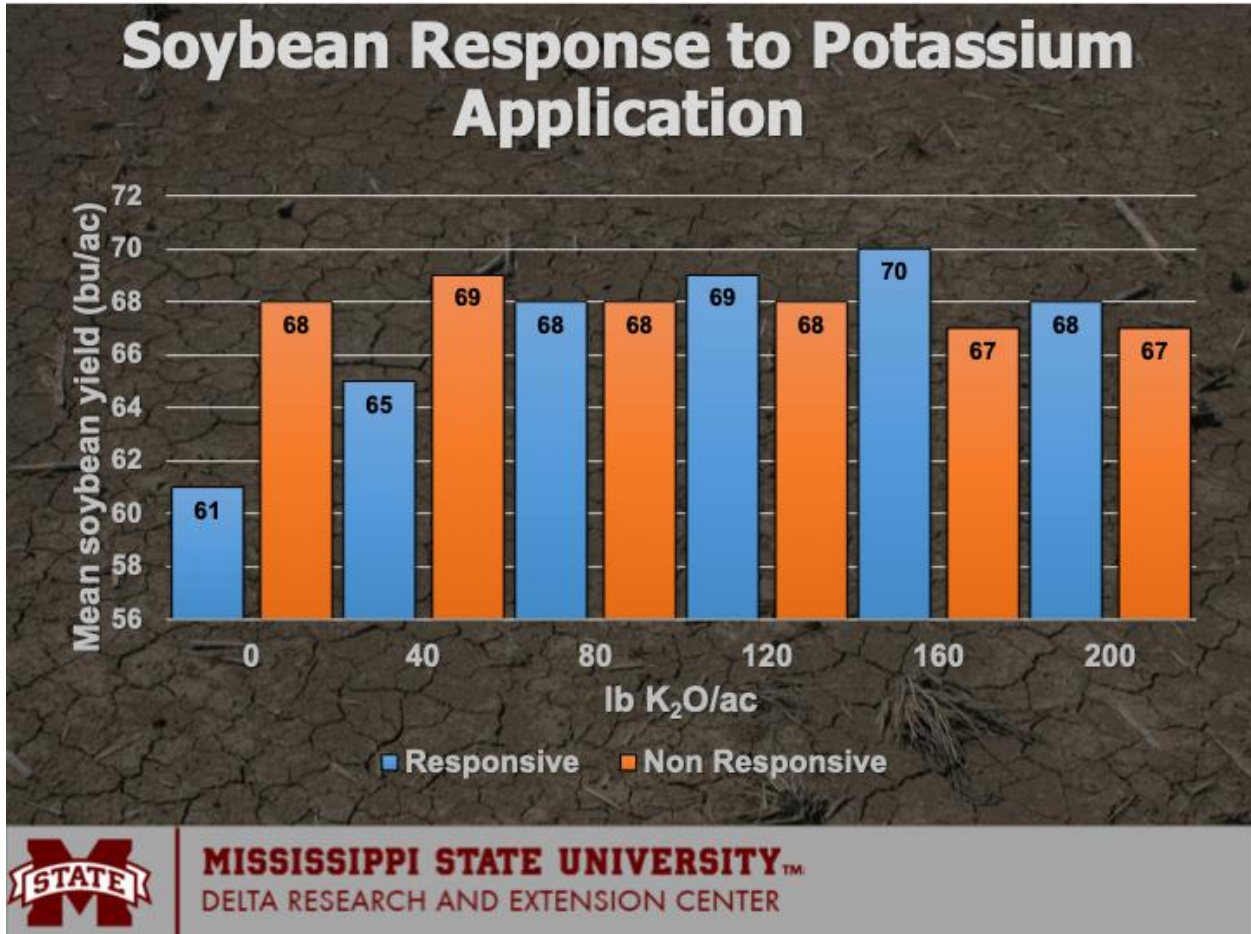
Category	CEC ≤7	CEC 7-14	CEC 14-25	CEC 25+
Very Low	0-50	0-60	0-70	0-80
Low	51-110	61-140	71-160	81-180
Medium	111-160	141-190	161-210	181-240
High	161-280	191-335	211-370	241-420
Very High	280 +	335 +	370 +	420 +

Table 2. Revised Soybean Potassium groupings based on soil test extractable K in pounds per acre

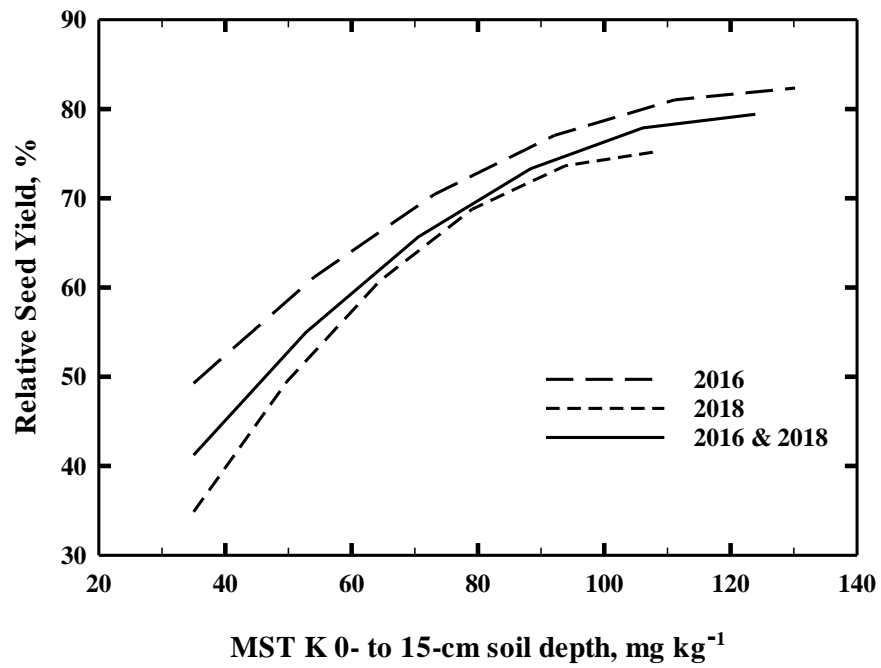
Category	CEC ≤7	CEC 7-14	CEC 14-25	CEC 25+
Very Low	0-70	0-90	0-120	0-150
Low	71-150	91-190	121-240	151-260
Medium	151-200	191-240	241-290	261-320
High	201-350	241-420	291-510	321-560
Very High	350 +	420 +	510 +	560 +

Table 3. Current and revised soybean recommended fertilizer rates in pounds per acre for K2O.

Category	Current	Revised
Very Low	120	120
Low	60	90
Medium	60	60
High	0	0
Very High	0	0



Data from research trials conducted between 2011-2019 in the Delta area of MS from Bobby Golden.



Response curve of relative seed yield influenced by increasing MST K for the 0- to 15-cm up to the relative seed yield plateau. Data from Dygert. 2019. Varietal and Residual soil test K level effects on soybean leaf K status and yield. MS Thesis. Mississippi State University.