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Low soil phosphorus and potassium limit soybean grain yield in Ohio

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A soil survey was conducted in Ohio with *the following objectives*: (i) to assess the status of soil fertility; (ii) to examine soybean grain yield in areas with fertility levels in the build-up range, where soil test levels were less than the critical level (CL); the maintenance range, where soil test levels were between the CL and maintenance limit (ML); and the drawdown range, where soil test levels were greater than the ML; and (iii) to determine if the soil test and yield data collected support the state-established fertility recommendations. Soil sampling was conducted from 2013 through 2015 resulting in 593 total samples. Soil P, K, Ca, Mg; pH; organic matter (OM); and cation exchange capacity (CEC) were measured. Soybean grain yield was also collected from the sampling areas. Twenty-one and 23% of the soil samples collected were within the build-up range for P and K, respectively. On average, grain yield was 470 kg/ha lower in sampling areas associated with soil P levels in the build-up range, whereas an average grain yield reduction of 269 kg/ha was associated with K levels in the build-up range. In sampling areas, there was no difference in grain yield associated with soil P and K levels within the maintenance range and drawdown range. Our data suggest that soil test levels within the build-up range were associated with lower soybean grain yields.