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Title: Effects of summer planting dates and winter tillage on middle Tennessee mung bean production

The incorporation of new crops, such as the mung bean (*Vigna radiata*), into middle Tennessee row crop agriculture holds the potential to enhance biodiversity within crop rotations and between farm fields. Mung bean's short maturity of 90 days allows for rapid crop turnover, and increased production on a per acre basis. The objective of our research was to determine how different mung bean varieties performed after a winter wheat rotation with different summer planting dates ranging from May to July depending on the season. A multi-year, varietal trial was conducted in Nashville, middle Tennessee, and focused on four varieties of mung bean (AAMU, Berken, HPO, and OK2000) across two years (2022 and 2023). During these trials, we evaluated various experimental methods for mung beans. For example, we used 25-meter square blocks with rows spaced at 30 inches in year 1. Subsequently, plots were reduced from a 25-meter square to a 20 ft square with four row plots at 15-inch row spacing in year 2. A total of 16 plots represented two planting times and four repetitions in a split block design across two sides of the field half of which was tilled before wheat in the previous winter and half of which was not tilled. Despite encountering abiotic and biotic constraints such as drought and weeds, the mung bean varieties had a production potential of up to 875 lbs. / acre. Plant maturity varied with planting time but generally was 90-100 days. Yield was higher for Berken and HPO in 2023, but not significant different in 2022. Mid-June to early July was identified as optimal planting period, attributed to more consistent moisture and reduced competition from annual weeds. A noteworthy outcome was the successful introduction of the HPO or Handy Pantry Organic variety, which demonstrated better yields and biomass than other experimental lines (at P value < 0.02). HPO outcompeted weeds with minimal manual intervention. In addition, phenotypic data collection revealed a negative correlation between yield and increased stem count, but positive correlation with biomass / plant height providing valuable insights into the crop's yield components and growth characteristics.