The Effects Plant Type and Seeding Density on Plant Growth and Pod Yield

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Peanut genotypes vary widely in their plant architecture, in this case meaning the width and height of their canopies. This study aimed to determine if two experimental runner market type genotypes with very small plant architecture (i.e. shorter main stem and lateral length) would produce increased pod yield (as compared to two runner types with large vines) when planted in greater density (6 seeds/row ft. vs. 12 seeds/row ft.) in 9 inch twin rows. Results showed that the seeding density resulted in different plant stands at harvest (7.6 plants/ft for the 12 seeds/row ft. vs. 4.4 plants/ft for the 6 seeds/row ft.; LSD=0.62 plants/row ft.). Genotypes differed in their final plant stand (LSD 0.33 plants/row ft.) with FloRun™ '331' (7.0 plants/row ft) > TUFRunner™ '297' (6.1 plants/row ft) > 12x23-4 (5.7 plants/row ft) = 12x23-1 (5.4 plants/row ft). In addition to the main effects, there was genotype x seeding density for final plant stand whereby there was no difference in final plant stand among the genotypes when seeding density was 6 seeds/row ft. but when planted at 12 seeds/row ft., each genotype had different final plant stand (LSD=0.47 with the smallest difference among means of 0.51 plants/row ft.). Plant height was greater in the 12 seeds/row ft. compared to 6 seeds/row ft. (16.9 inches vs. 15.2 inches). Genotypes differed in plant height with FloRun™ '331' (19.4 inches) > TUFRunner™ '297' (16.9 inchs) > 12x23-4 (14.1 inches) = 12x23-1 (13.8 inches). Pod yield was largely unaffected by seeding density or genotype with less than 186 pounds/acre pod yield difference on average between the 6 and 12 seeds/row ft. seeding densities. FloRun™ '331' had higher yield (6017 lbs./A) than the other three genotypes (<5676 lbs./A) but there was no difference among the other three (LSD=212 lbs./A). It appears that genotypes with larger vines may not offer higher yield potential than those with much smaller vines. This would indicate that the harvest index of peanut, at least as measured by above-ground biomass is mailable. Even though we did not measure the biomass directly, the main stem length of the largest genotype was 5 inches greater than the two smallest genotypes which is likely to translate into significantly more above-ground biomass in FloRun™ '331' and TUFRunner™ '297'. Peanut genotypes with smaller canopies and competitive pod yield could be beneficial for mechanized agriculture since there is less vine mass to interfere with digging and picking processes. Smaller plant architecture might even speed the digging and harvest processes resulting in a net increase in efficiency of harvesting operations.