

GUAYULE RESPONSE TO PLANT POPULATION
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Optimum plant population is critical for guayule (*Parthenium argentatum* A. Gray) commercial production and varies with genotypes. Two plant population studies with five plant populations and two distinctly different guayule genotypes were planted at Eloy, AZ in April, 2018 and at Tucson, AZ in September, 2018. With row spacing of 101 cm, five in-row spacings (76, 46, 30, 15, and 7.5 cm) correspond with five targeted plant population, 12916, 21527, 32291, 64582, and 129162 plants/ha. The two genotypes were tall and spreading AZ-2 and short and compact Sel-1. After stand establishment and thinning, NDVI (normal differential vegetation index), canopy width, canopy height, and canopy temperature were measured weekly at Eloy using phenotyping platform build by Bridgestone. For all measurements, the differences between AZ-2 and Sel-1 were significant. AZ-2 had wider and taller canopy as well as higher NDVI value. Because of higher biomass and higher transpiration, canopy temperature of AZ-2 were also lower than Sel-1. The effects of plant population treatment on NDVI, canopy width, and canopy temperature can also be seen clearly. Biomass sampling at 7 months and 11 months at Eloy showed that biomass increased with higher plant population and tall genotype AZ-2 had significantly higher biomass compared to Sel-1. Plant size decreased as plant population increased, and AZ-2 plant size was much larger than Sel-1 plant size. Both rubber and resin content did not respond to plant population treatment in the first two samplings. However, AZ-2 genotype had lower rubber content and higher resin content according to NIR measurements. More samplings will be conducted in fall 2019 and final harvest will be conducted in spring 2020 to compare the effects of plant population and genotype on biomass yield and rubber yield.

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