ROOT SYSTEM OF FORAGE PEANUT GENOTYPES UNDER TWO LEVELS OF WATER AVAILABITILY

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Forage peanut (*Arachis pintoi* and *Arachis repens*) is cultivated in regions of the humid tropics, subject to four months of drought, when forage yield decreases. Field studies have shown that there is genetic variability for drought tolerance in forage peanut. However, morphophysiological responses of different genotypes are poorly understood under water deficit conditions. The objective of this study was to evaluate the root system of different genotypes of forage peanut under two levels of water availability.

Nine genotypes of forage peanut (BRA015253, BRA034100, BRA040894, BRA042170, BRA042242, V1(59) and E5 F1 hybrids, Belmonte and BRS Mandobi), with different dry matter yield in the dry season of Rio Branco, AC, Brazil, were evaluated in a greenhouse at two levels of water availability. The design was completely randomized, with treatments arranged in a 9x2 factorial, with four replications. Rooted stolons were transplanted into acetate tubes of 95 cm in length by 9.5 cm in diameter. At the irrigated level, 95% of field capacity was maintained and in the non-irrigated level, irrigation was suspended 10 days after transplanting. When 50% of the genotypes were under 50% of the field capacity (25 days after the irrigation suspension), the experiment was interrupted and shoot dry mass (SDM), root dry mass (RDM), root system length (RSL) and root system density (RSD) were evaluated. RSD was measured at depths of 0-15; 15-30; 30-45; 45-60; 60-75; and 75-90 cm, considering a split plot design. Data were submitted to analysis of variance, Scott Knott and Tukey tests, at 5% of probability.

No significant interaction ($p>0.05$) between genotypes and water availability was observed. The effect of genotypes was significant ($p<0.05$) for RSL. There was an effect of water availability for RDM and RSL ($p<0.01$). For RSD, significant interaction ($p<0.01$) between depth and water availability was observed. The mean of RSL was 47.1 cm. V1(59) and BRS Mandobi showed the largest root length (62.8 and 53.1 cm, respectively), whereas Belmonte presented the smallest one (37.2 cm). RDM and RSL showed higher mean values for the non-irrigated level (1.26 g and 60.6 cm) when compared to the irrigated one (0.91 g and 33.7 cm). RSD was higher for the irrigated level only at depth of 0-15 cm (788.1 mg dm^{-3} for irrigated versus 677.8 mg dm^{-3} for non-irrigated). At the irrigated level, 86.2% and 96.5% of the roots were concentrated in the first 15 and 30 cm, respectively, and did not reach the deeper layers. At the non-irrigated level, 53.4% and 93.6% of the roots were allocated up to 15 and 60 cm deep, respectively.

Root system of forage peanut can be adequately study using long acetate tubes. However, to identify more drought tolerant genotypes, it is necessary to impose a more severe water deficit. BRS Mandobi and V1(59), classified as less drought tolerant in the field, have higher growth of root system, regardless of water availability. Forage peanut presents plasticity of the root system, whose growth is stimulated under moderate water availability.

PRESENTER BIO: Dr. Giselle Assis is a researcher at Embrapa, where she has been since 2005. She is also a postgraduate professor at UFAC. Her area of expertise is forage breeding. She coordinates the *Arachis pintoi* Breeding Program and collaborates in *Stylosanthes*, *Brachiaria* and *Panicum* genetic evaluation for the Brazilian humid tropics.