

Root interactions on sole crop and intercrop give different effects of competition

ABSTRACT

Root interactions on sole crop and intercrop give different effects of competition. Understanding on root interactions is very challenging due to the methodology limits in root studies especially when we intercrop between tree and crop components. The objectives of this study were (1) to measure the aboveground and belowground biomass of intercropped Acacia hybrid with *Beta vulgaris* (red beet) and (2) to determine the rooting pattern at each rhizotron depth. This study involved three (3) types of treatments, Acacia hybrid sole crop, *Beta vulgaris* sole crop, and intercropping of these two species. Root intensity and root biomass were measured. Root growth of red beet was affected by the presence of Acacia hybrid while Acacia hybrid was not affected for both either in sole or intercrop. However, the root intensity of Acacia hybrid was higher in deeper soil layer when intercrop with red beet. For the root biomass, Acacia hybrid was slightly affected when intercrop with red beet. In contrast, red beet was higher when intercrop with Acacia hybrid. In terms of shoot biomass, both crops were not affected when they are in sole or intercrop. The rooting pattern showed that the root length density was dominant in the upper layer for both crops, and intercrop treatment was significantly higher compared to sole crops. In conclusion, Acacia hybrid is the competitor to the red beet in belowground interaction in terms of root growth and rooting pattern. There is no differences in terms of aboveground interactions.