

103. Effect of mycorriza and diazotrophic bacteria on the development of oil palm on a reclamation area containing leguminous trees

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The oil palm (*Elaeis guineensis*, Jacq), is a palm tree of African origin. This perennial can produce more than 7 tons of oil per hectare per year and has a useful lifespan of up to 25 years. The oil has great potential for use as a fuel (palm oil-diesel). The experiment was set up in an area where bauxite waste from the Alumar Factory (Consórcio de Alumínio do Maranhão), was deposited. A random block design was used with 8 treatments and 10 replicas in each plot. The treatments consisted of 6 cultivars; C2501, C2301, C2328, C3701, C2801, C7201 and two hybrids: RUC 13 and RUC 87. Initially pre-germinated seeds were planted in a nursery, and then the seedlings were transferred to pots at 4 months and after presented 10 to 12 well developed leaves, the plants were transplanted in the field described above with a spacing of 9 x 9 m. Samples of roots were collected for determination of mycorrhizal and bacterial colonization when the plants were transplanted from the nursery to the field and again 9 months later. A semi-quantitative most probable number analysis of the bacterial present in the roots of the oil palm genotypes was conducted (DOBEREINER, et al., 1995). The presence of mycorrhiza in the roots was determined using microscopic evaluation (KOSKE & GEMMA, 1989). The roots from cultivars C3701, C7201 and C2501 and the hybrid RUC 87 would have increasing populations of diazotrophic bacteria during the 9 month period following transplantation to the field of 65, 136, 54, and 36%, respectively. Before the seedlings were planted in the field, the best result for micorrhizal infection was observed with genotypes C2301, RUC 13 and C2501 where colonization was 10 to 20%. After planting in the field there was a significant increase in the colonization of all of the cultivars reaching an average of 38% with a variation between 20 and 40%. This increase included cultivars C7201 and C3701 which were not colonized in the nursery, however, under field conditions, colonization of these cultivars was 24 and 30%, respectively. The mycorrhizal association is important for the species in the field, such that greater colonization leads to greater development of the plant. This is illustrated by results obtained with C2328 and RUC 87. Using diameter as a measure of performance, C2328 had a diameter of 3.23 cm in the nursery and 7.22 cm in the field and RUC 87 had a diameter of 3.14 cm in the nursery and 7.36 cm in the field. This represents an increase of 124% for C2328 and a 134% increase for RUC 87 between plants cultivated in the nursery and those cultivated in the field. From the results described above it can be concluded that the association of mycorrhiza and diazotrophic bacteria with oil palms favors development of the plant in areas that contain bauxite waste.

References:

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