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### K competition between crops and young oil palm in agroforestry systems in the Allada plateau smallholdings, Benin

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Beninese smallholders associate food or cash crops with young oil palm stands to reduce field maintenance costs and gain income before the oil palm comes into production. However, little is known about the effects of these agroforestry systems on nutritional and growth status of the tree at end of its juvenile phase although it is well known that the tree production could be affected by the management in juvenile phase. We selected 15 plantations where the crop succession associated with the trees was mostly based on maize, cassava, tomato and pineapple respectively. Nutrient contents in soil and tree leaves, and the vegetative growth of the tree were examined at end of juvenile phase. We found that N and P nutrition of young palms was satisfactory but K nutrition was deficient in all systems especially in tomato and pineapple ones. There was a significant correlation between K contents in soil and palm tree leaves. In the pineapple- and tomato-based systems, the amount of K fertilizer did not compensate the exportations by the crop. We concluded that competition for K are particularly important in pineapple- and tomato-based systems although fertilizer inputs were the highest. Trade-offs between profitability of these associated crops and the productive performance of the tree could be sought. A better adaptation of mineral fertilization could help in satisfying these compromises.



Figure: Main oil palm agroforestry systems developed by smallholders in the Allada region (Southern Benin). Oil palm tree associated with: A (top-left), Pineapple; B (top-right), Tomato; C (bottom-left), Maize; D (bottom-right), Cassava. The annual crops are maintained no longer than the immature period of the trees. © H. Koussihouédé

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