EFFECT OF LEGUME PLANT DENSITY AND INTERCROPPING ON PERFORMANCE OF MAIZE AND MUCUNA

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ABSTRACT
A study was conducted to evaluate the effect of strategic adjustments to the maize-mucuna intercropping system in order to minimize interspecies competition for resources, without significant loss in maize and mucuna yields. The results of the study showed that intercropped mucuna sown two weeks after planting maize produced 72-74% of the legume monocrop yield, irrespective of the legume density. Delaying the planting of mucuna by four weeks led to the reduction of maize grain yield from 30-41% to 1-25% in a maize-mucuna intercrop. However, such a delay would be harmful to mucuna since it was shown to cause a significant loss in legume DM yield, especially under the low legume density of 20,000 plants/ha. All the maize-mucuna intercropping systems had LER > 1 but systems in which the legume was planted at the same time with maize or two weeks later (irrespective of legume density) consistently had LER ≥ 1.5, indicating a greater increase in resource use efficiency than that in systems with late planted mucuna. When a high legume density (40,000 plants/ha) was used, the LER of the maize-mucuna intercropping system was not affected by time of under-sowing the legume. This was probably an indication of stability in resource use by a maize-mucuna intercropping system (i.e. stable LER) across different times of sowing mucuna. Thus, use of the high mucuna density is likely to stabilize the maize-mucuna system in terms of its resource use, irrespective of the relative planting times of the two crops.

From the above results, it is recommended that mucuna be under-sown into maize two weeks after planting the maize since this would ensure less than 30% reduction in the yields of each of the two crops (relative yields > 70%). As evidenced by the results of this study, planting the legume two weeks after planting maize is also likely to maintain suitable resource use efficiency in a maize-mucuna intercropping system across seasons. A mucuna plant density of 40,000 plants/ha is recommended since the results showed that it would ensure stable yield advantage of a maize-mucuna intercropping system over the monocrop systems.

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