INTERCROPPING
in semi-arid areas

Report of a symposium held at the
Faculty of Agriculture, Forestry
and Veterinary Science,
University of Dar es Salaam,
Morogoro, Tanzania,
10-12 May 1976

Editors:
J.H. Monyo, A.D.R. Ker,
and Marilyn Campbell

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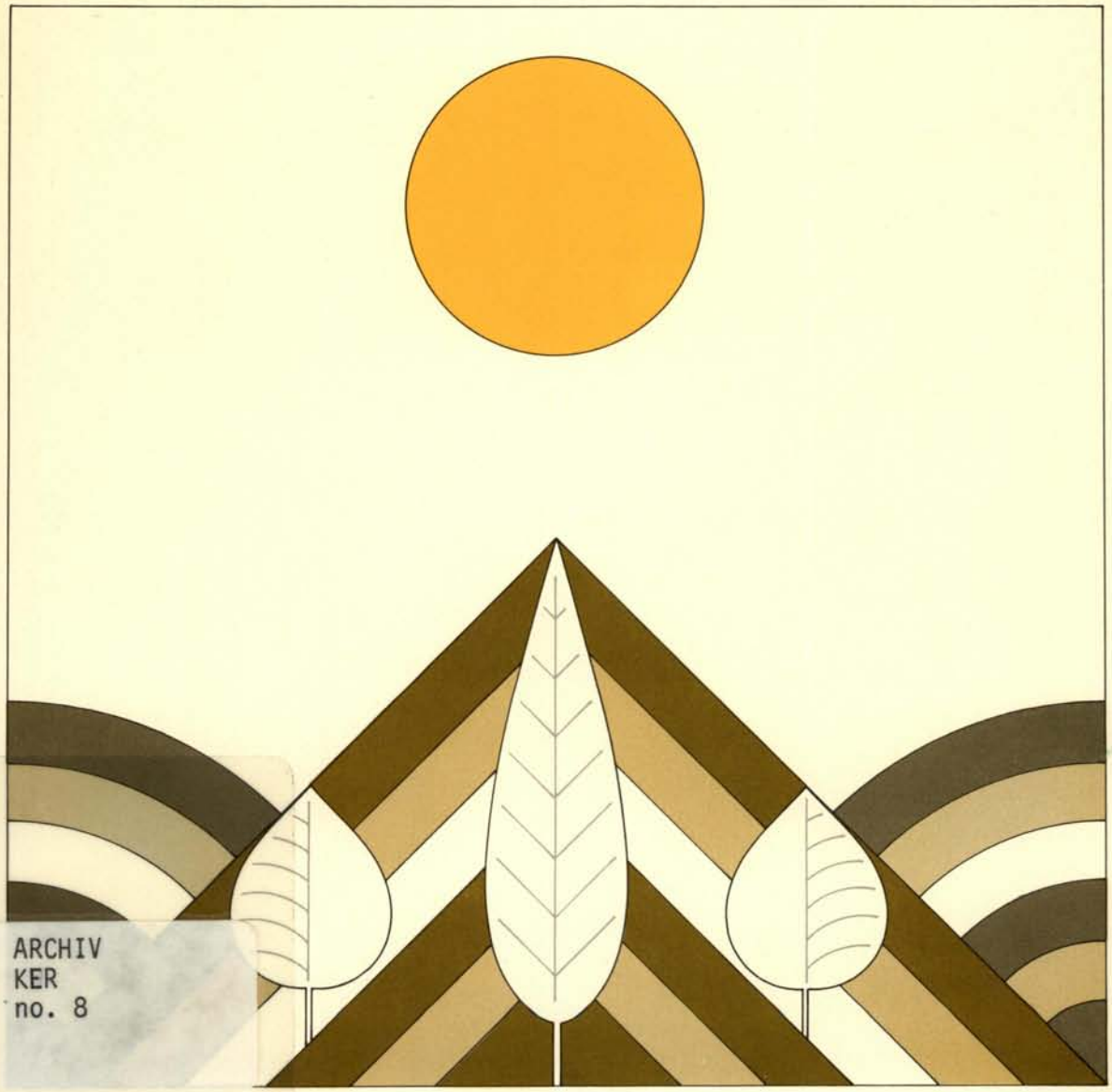

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Farmer's field near Ibadan, Nigeria, showing intercrop of cowpea under maiz

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Contents *(concluded)*

Preliminary Results of Intercropping Trials in Zaire with Maize and Certain Legumes

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Practically without exception, maize farms throughout Zaire are planted on raised beds, about 40–50 cm high with an interbed (interrow) spacing of approximately 1 metre. Maize hills usually consist of two to four plants at about 50 cm spacing along the bed. Even amongst the most progressive farmers, this laborious practice of hoeing-up beds for maize culture exists.

Following harvest, farmers put the current season's maize fodder together with various weeds and other crop residues (squash vines, tomato vines, peanut tops) on the surface of the ground in the bottom of furrows between the current season's beds. These furrow bottoms become next year's beds, and the residues, mainly maize fodder, act as the new year's fertilizer supply.

Although the system as described above seems ingenious on the one hand, because (1) the raised beds would improve soil drainage if drainage were a problem; (2) owing to the raised culture, each maize plant probably has access to more topsoil than on flat culture and thus more fertilizer via the mineralization of organic matter; and (3) the system provides a means of putting under next year's fertilizer supply, viz., the maize fodder, other crop residues, weeds, etc.; on the other hand, there are at least as many arguments against the system as for it. In the first place, growing maize on poorly drained areas should be avoided, particularly since the maize crop is very sensitive to "wet feet," especially in countries like Zaire where there is no squeeze due to land pressure, either to a lack of arable land or the privilege of being able to farm it. Secondly, preparing such beds requires tremendous quantities of human physical energy; energy that could be spent on much more productive things. Though farmers will often say that flat culture is much more work than their traditional farming method, the bold fact remains that insofar as land preparation is concerned, such is just not the case in spite of the fact that any method of land preparation using the hoe prior to planting is by far the hardest phase of maize farming. That weeding, sidedressing, and hoeing-in of fertilizer urea are viewed as extra work in flat culture by farmers is another matter that should not be confused with land preparation, and the farmers need to be taught and convinced that their failure to weed or sidedress fertilize their maize fields, as they traditionally do not do, is not in their best interest, though at present, they often simply view the practice as unnecessary or unprofitable expenditures of work and money. Thirdly, little benefit is actually derived in terms of nitrogen and phosphorus from using last year's maize fodder as the fertilizer source for next year's maize crop. The extremely wide C:N in dry maize stalks adds but a trifle of useful fertilizer elements and therefore the fodder is also of little or no value in contributing to soil humus either.

Since the use of raised beds will doubtless be in practice for years to come, a trial was conducted to evaluate the effectiveness of maize stalks as the fertilizer source now generally used by many maize farmers in Zaire. Additionally, the potential of *Crotalaria caricea* and *Vigna unguiculata* intercropped with maize was anticipated to augment the following year's maize yield when used as a crop residue like maize fodder is now used by farmers.

All cropping systems studied in the trial were done with and without fertilizer and with and without crop residues.

Important highlights from the results reveal that:

(1) fertilized plots highly significantly outyielded plots that received no fertilizer;

(2) plots that received maize stalk residues or those intercropped with a legume (*C. caricea* the previous year 1973–74 and *V. unguiculata* during the season for which the results are presented, viz., 1974–75) highly significantly outyielded plots that received no residues or legume intercrop;

(3) plots intercropped with a legume highly significantly outyielded those plots that were not legume intercropped, but received only maize fodder residues.

(4) plots intercropped with a legume on the same day as maize was planted significantly outyielded plots where the legume was planted after maize. (N.B.: For the 1973–74 season, *Crotalaria* was planted 19 days after maize sowing, and for the 1974–75 season, *Vigna* was planted 12 days after maize sowing.)

Thus far the results of the still-ongoing intercrop trials on two soil types are very encouraging, particularly on yellow clay soil. Maize yields are clearly augmented dramatically when maize is grown on ridges that were furrows grown to a legume the previous year. The trial has also shown that *C. caricea* competes too severely with maize if planted at the same time as maize whereas the converse is true when *V. unguiculata* is the legume intercropped with maize.