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INTERCROPPING

Proceedings of the Second Symposium on Intercropping in Semi-Arid Areas, held at Morogoro, Tanzania, 4-7 August 1980

Editors: C.L. Keswani and B.J. Ndunguru

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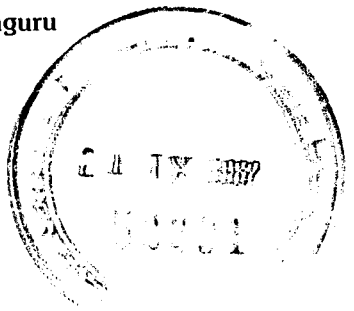

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Postal Address: Box 8500, Ottawa, Canada K1G 3H9
Head Office: 60 Queen Street, Ottawa

Keswani, C.L.
Ndunguru, B.J.

University of Dar es Salaam, Dar es Salaam TZ
Tanzania National Scientific Research Council, Dar es Salaam TZ
International Development Research Centre, Ottawa CA

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cropping, whereas different cultivars formed the subplot treatments. Average disease scores were calculated per experiment; separate for monoculture beans and beans grown in association with maize.

It was observed that compared with monoculture, beans grown in association with maize showed a lower incidence of the following diseases and pests: halo blight, bean common mosaic, anthracnose, common blight, scab, phoma, mildew, bollworm, and, to a lesser extent, angular leaf spot. For white mold and black *Systates*, the opposite was observed. Rust and aphids were erratic in this respect. Apparently, a kind of biological control of the major bean diseases is effected, in Kenya, by growing beans in association with maize.

Discussion

Ayiseni (question): In your paper, you presented the results of disease scores. As you may be aware, the disease scores depend upon the genotypes or cultivars used. In your paper this is not clear. Could you, therefore, specify the genotypes or varieties of beans and maize that you used in these experiments.

Muigai (answer): The variety used in the agronomic experiment was K-74, which had no resistance to diseases and pests. In the breeding trials, there were 12 cultivars and none of them had resistance to any of the diseases. Where we made comparisons, we used the same cultivar.

Effect of Intercropping on Some Diseases of Beans and Groundnuts — Summary

J. K. Mukiibi

Department of Crop Science, Makerere University, Kampala, Uganda

Observations were made on the diseases of beans and groundnuts in an experiment utilizing these crops planted as monocropped beans, two-thirds beans/one-third groundnuts, one-third beans/two-thirds groundnuts, and monocropped groundnuts with three different populations: 11, 22, and 44 plants/m^2.

The incidence of groundnut rosette was considerably lower in the intercrops than in pure stand, especially at higher plant densities. As expected, the incidence of rosette decreased with increasing plant densities irrespective of whether groundnuts were planted as a monocrop or an intercrop.

The severity of the leaf spot disease caused by *Cercospora arachidicola* was somewhat less in the intercrops than in the pure stands during the first 60 days after planting. Later, this difference disappeared. Intercropping seemed to have had no marked effect on the leaf spot disease caused by *Cercosporidium personatum*.

Intercropping groundnuts with beans had no effect on the incidence or severity of leaf rust, angular leaf spot, or white mold in beans because the groundnuts had little influence on the microclimate of the bean component in the intercrop. The beans, however, grew much faster and developed a canopy that was able to cover partially the groundnuts in the intercrop.

Discussion

Mugabe (question): What have you in mind regarding your plan to carry out a series of legume/legume and legume/cereal experiments with regard to the possibilities of disease occurring in your experimental area?

Mukiibi (answer): We are going to move from site to site.

Keswani (comment): Generally, the farmer does not move from one place to another for cultivation. Therefore, it would be advisable to conduct experiments on the same piece of land to simulate the farmers' situation.

Nsemwa (question): I note that Professor Mukiibi preferred to use the number of spots and the number of pustules of rust as the disease indices in his presentation. What advantage does this choice have in preference to disease indices based on infected leaf area? Would he recommend to other workers the use of his method

rather than the more conventional indices, using a scale of 0.5 or 0.9, for example, based on infected leaf area?

Mukiibi (answer): I performed the experiment with groundnut in 1974/1975, comparing different methods of assessing disease. I have come to the conclusion that counting the number of spots is a more sensitive and better method for my own system. It is more laborious, however, and will depend upon the availability of labour.

Mphuru (question): I am wondering why the author decided to intercrop beans and groundnuts? Both are legumes and as such not much interaction would be expected. Was this combination chosen because this is a normal crop combination in Uganda?

Mukiibi (answer): Yes, they are interplanted in Uganda. The tests are also part of a series of experiments that I am conducting to look at the interaction between different crops and diseases. Cereals are also included.

Doto (question): Could you provide some background information as to why relatively high standard errors have been associated with two-thirds beans/one-third groundnuts for angular leaf spot in beans? Secondly, would you advocate increased K use to minimize angular leaf spot disease in beans?

Mukiibi (answer): One explanation is that we had K deficiency with beans and *Isariopsis* was more severe in the plots with K deficiency. Use of potassium to control angular leaf spot would be extrapolating too much.

Effect of Insecticide Spray on Insect Pests and Yield of Sorghum and Simsim in Pure Stand and in Intercropping — Summary

D. Kato, A. K. Karel, and B. J. Ndunguru

Department of Crop Science, Faculty of Agriculture, Forestry and Veterinary Science, University of Dar es Salaam, Morogoro, Tanzania

Intercropping, or mixed cropping, is the traditional cropping system practiced by subsistence farmers in Tanzania. Many researchers have worked on sorghum intercropped with other crops, such as pigeon pea, cowpea, soybean, groundnuts, etc., and have reported greater overall yield per hectare than growing these crops in pure stand. In most of these studies, yield components have been studied to show the yield advantages associated with intercropping but little or no attempts have been made to study insect pests and the damage caused by them to component crops; despite the fact that crop yield depends upon the interaction between plant growth and damage caused by pests. Therefore, experiments were undertaken to study the effect of insecticides on insect pests and the yields of sorghum in pure stand and when intercropped with simsim.

The experiment was conducted in the Horticulture Unit of the Faculty of Agriculture, Forestry and Veterinary Science at Morogoro, located at an altitude of 525 m. Fifty kg/ha of triple superphosphate was applied at the time of land preparation and 100 kg N/ha was applied along the plant rows after seed germination. When the plants were about 15 cm high, they were thinned to 1 plant/hole in both sorghum and simsim. The experimental design used was a split plot with a plot size of 6.3 m × 5 m.

Sorghum variety Serena and simsim variety Morada-2 were used. Pure stand sorghum and simsim were planted at a spacing of 10 cm within the row and 50 cm between the rows, giving a plant population of 200000 plants/ha. For intercropped plots, sorghum and simsim were planted at three different spacings to study the effect of increasing plant population on productivity. The distances between plants within the rows were 10, 7.5 and 5 cm, thus obtaining the following treatments: (1) pure stand sorghum; (2) pure stand simsim; (3) sorghum and simsim, within-row spacing of 10 cm; (4) sorghum and simsim, within-row spacing of 7.5 cm; and (5) sorghum and simsim, within-row spacing of 5 cm.

Didimac 25 (25% DDT) was applied at a rate of 1 kg active ingredient per 600 L of water per hectare at 19, 25, 32, 38, 53, and 76 days after planting (DAP) to all plots in the main plots des-