Dithane M-22. Seed size was also significantly greater for these treatments over unsprayed plots. The Top Cop treatments significantly reduced rust but did not result in a significantly higher yield over the control. A single early application of Bravo 500 or Dithane M-22 reduced disease severity similar to three applications beginning 1 week later, but only the Dithane three application treatment resulted in significantly higher yields.

Treatment and rate (f)/A	Number of weekly sprays	Yield (lb/A)	Seed Size (#seeds/lb)	Total Leaf Area with Rust (%)
Control..........0	-	1558	1394	45
Top Cop w/sulfur..1 qt	1*	1471	1394	36
Top Cop w/sulfur..1 qt	3**	1681	1370	27
Bravo 500.........2 pt	1*	1753	1290	25
Bravo 500.........2 pt	4*	2031	1263	7
Bravo 500.........2 pt	3**	1778	1313	22
Bravo 500.........2 pt	4**	1759	1301	22
Dithane M-22 80W..2 lb	1*	1848	1339	30
Dithane M-22 80W..2 lb	4*	2113	1264	8
Dithane M-22 80W..2 lb	3**	2093	1273	24
Dithane M-22 80W..2 lb	4**	1871	1282	18
LSD (P = 0.05)............................		386	68	7

*application at first sign of rust
**application began 1 week after first sign of rust

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THE EFFECT OF INSECTICIDE APPLICATION AND PLANT POPULATIONS ON INSECT PESTS AND YIELD OF INTERCROPPED MAIZE AND BEANS

A. K. Karel and R. D. R. Matary

Department of Crop Science

University of Dar es Salaam

P. O. Box 643, Morogoro, Tanzania

Intercropping of beans with cereals is a traditional practice among peasant farmers in Tanzania. Beans are more commonly intercropped with maize than any other cereals. Although speculations have focused on the possibility that there are fewer insect pests on these crops when intercropped, there has been little empirical work. An attempt was therefore made to study the effect of insecticide applications and plant populations, on the insect pests and yield of monocultured and intercropped maize and bean.

Material and Methods: The experiment was conducted at Morogoro (Lat. 5.8, altitude 525 m, oxisol) during 1982 cropping season. The experiment was set out in a split-split plot design with two main treatments (sprayed and unsprayed regimes). Both possible combinations of one third/two third of the component crops were formed. Thus four crop combinations of pure maize, two third maize/one third beans, one third maize/two third beans, and pure beans, were used as subtreatments. The sub-sub treatments were three plant populations (half the optimum, optimum and double the optimum) of both crops:

Maize (Ilonga composite)	Beans (Selian Wonder)
P_1 = 75 x 60 cm (22,222 plants/ha)	P_1 = 37.5 x 40 cm (66,666 plant/ha)
P_2 = 75 x 30 cm (44,444 plants/ha)	P_2 = 37.5 x 20 cm (133,333 plants/ha)
P_3 = 75 x 15 cm (88,888 plants/ha)	P_3 = 37.5 x 10 cm (266,666 plants/ha)

Thus there were in all 24 population treatment in the experiment.

In the "sprayed" plots, gamma HCH was sprayed at 600 g a.i./ha in 400 litres of water to control bean pests at 10, 24 and 38 days after planting. For the control of maize pests, especially stalk barers, aldrin dust was applied in maize fannels at 20 DAP.

Results and Discussion:

Pest incidence and damage: The incidence of pests, and damage caused by these insects to beans and maize were recorded both in intercroped and pure stands. The damage caused by foliar beetle *Ootheca bennigseni* was higher in intercropped than pure stand beans. The incidence of flower thrips (*Taeniothrips sjostedti*) was low both in pure stand and intercropped beans. It was observed that the higher plant populations had less infestation by flower thrips. The incidence of "American" bollworm (*Heliothis armigera*) was higher in pure stand than intercropped beans. The number of *Heliothis* larvae decreased with the increasing bean plant populations in all crop combinations. The incidence of pod borer (*Manica testulalis*) larvae was, however, generally low in both pure stand and intercropped beans. The insecticide applications effectively controlled the insects in all plant populations. The infestation of maize by stalk borers was more or less the same in pure stand and intercropped maize with all plant populations.

Seed yield: A significant seed yield increase was recorded following application of insecticides in "sprayed" plots. The highest yield was realized at population 2 for both species in monoculture. The bean yield in the mixtures followed a similar trend. However, maize had higher yields at two thirds maize/one third bean combination at all populations.

Maize in both mixtures gave higher yield than if it was grown separately. This trend was found at all plant populations except sprayed population 2 in two third maize/one third beans. This suggests that maize suffers less competition in the mixture than if grown in pure stand indicating that interspecific competition was less than intraspecific competition. In other words both species suffered less competition from each other.

Replacing one third maize by beans in all populations sprayed with insecticide resulted in an increase in maize yield, which was as high or higher than that realized by pure maize. Thus the combined yield of the two species produced an "Over Complementation" effect. A similar effect was also obtained when two third maize was replaced by beans in population 2 and 3 sprayed with insecticide and unsprayed plots of population 2.

Relative Yield Total: The relative yield total (RYT) was used for indicating whether the intercropping is beneficial or not. It was observed that both the mixtures (2/3 maize/ 1/3 beans and 1/3 beans / 2/3 maize) gave yield advantage at all populations. A yield advantage of as much as 80% at population 3 was observed. This is apparently higher than the optimum plant population for both component crops. In general, the yield advantage as a result of intercropping beans with maize was appreciably high.

The yield advantage may have occured due to morphological differences in the maize and bean crop plants. The component species were partially utilizing different parts of the environmental resources, both below and above the ground. As a result the intraspecific competition may have been greater than the interspecific competition. Further, there was a difference in maturity of the two species. Beans matured in 92 days whereas maize in 135 days. Thus the difference in exerting maximum pressure on the available resources at different times may give a yield benefit. The beans thus stand a better chance of utilizing the earlier part of the environment while maize the later part. This high yield advantage may have been also due to low insect pest infestation in higher population mixtures.

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The Influence of Irrigation Frequency, Soil Preparation, and Row Spacing on the Quality of Snap Beans, *Phaseolus vulgaris*

S. R. Drake, M. J. Silbernagel, and R. L. Dyck

Irrigation frequency influenced the quality of fresh, canned and frozen snap beans. Subsoiling influenced the quality of fresh snap beans. The seed index of fresh snap beans was reduced with optimal irrigation and subsoiling as compared to marginal irrigation and no subsoiling. Optimal irrigation resulted in a darker fresh snap bean with a high moisture and ascorbic acid content and lower shear values. Subsoiling resulted in fresh snap beans that were high in H_2O and low in shear values. Canned and frozen snap beans that were optimally irrigated were low in shear values, drained weight and drip losses. Under the conditions of this study, snap beans from optimally irrigated plots did have quality advantages over snap beans from marginally irrigated plots.

This study was conducted to determine the influence irrigation in conjunction with different soil preparation and row spacing may have on the quality of 'Blue Mountain' snap beans. 'Blue Mountain' is a new blue lake-type snap bean resistant to curly top virus.

These studies were conducted at the Washington State University Irrigated Agriculture Research and Extension Center, Prosser, WA. Snap beans 'Blue Mountain' grown under two irrigation rates and two row spacings were compared in subsoiled and non-subsoiled plots. Snap beans were planted in mid-May and harvested in late July. Prior to planting, one-half of the plots were subsoiled to a depth of 51 cm every 56 cm across the plots. Plant populations were constant with 21 seeds/m in 56-cm rows, and 15 seeds/m in 28-cm rows. The plots were irrigated two weeks after planting, and subse-