

**EFFECTS OF VARIOUS SORGHUM - COWPEA CROPPING SYSTEMS
ON YIELDS OF COWPEAS AND SORGHUM CROPS**

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Growing two or more crops together on the same land during the same season is a traditional cropping system that is widespread on subsistence farms in developing countries in the tropics, in Africa, India and Latin America. This type of agricultural system is known as intercropping or mixed cropping, depending on whether the crops are planted in separate rows or mixed within a row.

Although many crops are intercropped, legume intercropping is common because legumes have the potential of biological nitrogen fixation, which may be an important factor in conserving soil nitrogen. As mentioned in the literature some merits of intercropping include: increase in yield per land area and increase in economical returns as compared to sole crops or component crops. Despite these benefits intercropping has been shown in some environments to reduce nodulation and biological nitrogen fixation. In addition, legume yields tend to be reduced due to the competition for light.

An experiment was carried out in summer 1983 at the Campus Agricultural Center, Tucson, Arizona, to observe the effects of cropping systems of two tropical crops, sorghum and cowpeas. The following parameters were studied.

1. Effect on cowpeas dry matter production.
2. Effect on nodule fresh and dry weight, and activity.
3. Effect on yields of sorghum and cowpeas.
4. Effect on residual soil N.

The following results were obtained (Table 1) from samples harvested 70 days from planting.

Table 1. Cowpea biomass production as affected by three cropping systems.

Cropping system	Vegetative production dry weight plant ⁻¹ (gm)	Root dry weight plant ⁻¹ (gm)	Nodule fresh weight plant ⁻¹ (gm)	Nodule dry weight plant ⁻¹ (gm)	Nodule activity mole plant ⁻¹ hour ⁻¹
Monocrop	35.745 _a	2.0250 _a	0.6125 _a	0.1775 _a	134.9575 _a
Intercrop	13.545 _b	1.1050 _b	0.3300 _b	0.1175 _b	127.1025 _{ab}
Mixed crop	7.080 _b	0.6850 _c	0.2400 _b	0.0875 _b	108.275 _b
LSD (.05)	8.0476	0.2613	0.1920	0.0491	23.0188

From the above results we can conclude that intercropping reduces the vegetative production, nodule dry and fresh weight while there was no significant difference in the nodule activity between monocropping and intercropping.

Table 2. Effects of three cropping systems on yields of sorghum and cowpeas.

Cropping system	Sorghum yield plant ⁻¹ (gm)	Cowpea yield plant ⁻¹ (gm)	Land equivalent ratio
Intercrop	60.7500a	1.5800b	2.29
Monocrop	27.6875b	16.1175a	1.0
Mixed crop	56.8525a	1.5325b	2.15
LSD (.05)	10.0032	2.0928	----

Sorghum yields were increased by intercropping and mixed cropping. Meanwhile, the cowpea yield was greatly reduced by intercropping and mixed cropping. The overall yield as measured by land equivalent ratio (LER) is higher in intercropping and mixed cropping than monocropping.