

## Effect of bees on seed yield and components in pigeon pea

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Pigeon peas (*Cajanus cajan*) are a traditional pulse crop of India, South-East Asia and East Africa. Varieties have recently been developed for Queensland and New South Wales, but yields have been unreliable indicating that improvements in both varieties and agronomy are needed. The crop is considered self-pollinated, yet cross-pollination can be effected by honey bees (*Apis mellifera*) (1). Bees may therefore be needed to maximize pollination, which could improve yield stability. In the experiment reported here, we assessed the contribution of honey bees to seed yield under field conditions

### Methods

The genotypes Quantum, Hunt and B15B were sown in the field at the Agricultural Research Centre, Tamworth on 27/11/87. Main plots were genotype, split into sub-plots "bees"; there were four replications. Bee treatments comprised plots enclosed by tents (2 m x 2 m x 2 m), fabricated from shade cloth (32%). Nucleus hives of bees were placed in half the tents, and bees were excluded from the remainder. Treatments were applied from 16/2/88 to 13/4/88. At maturity, 1.44 m<sup>-2</sup> of each plot was hand-harvested from within each tent, and seed yield and its components determined.

### Results and discussions

The presence of bees increased yield significantly in the genotype B15B, but had no effect on the other two (Table 1). Its higher yield resulted from more pods and seeds per pod although seed size was less. Seeds per pod was increased significantly in all varieties by bees, indicating higher ovule fertilization rates. However, the contribution of more seeds per pod was diminished by reductions in seed size.

The data demonstrate that genotypes vary in response to bees; in order to maximize yield, future plant breeding should take this into account. It seems reasonable to propose that new varieties should show little or no response to bees, as bee populations in dryland farming areas are often low.

**Table 1. influence of bees on seed yield and components in pigeon pea.**

Genotype	Bees	Yield	Pod no.	Seed no.	Seed size
	(+/-)	(kg/ha)	(m <sup>-2</sup> )	(/pod)	(g/100)
Hunt	-	1603	788	2.57	8.75
	+	1481	698	3.17	7.41
Quantum	-	1774	743	3.31	8.05
	+	1949	774	3.75	7.47
B15B	-	1135	458	2.42	11.07
	+	2086	712	3.35	9.64
S.E.D.		205	77	0.22	0.34

1. McGregor, S.E. (1976). in "Insect Pollination of Cultivated Crop Plants". USDA Agriculture Handbook No. 496.