attack (4.83 larvae 20-twigs^{-1} with coriander and 6.83 larvae 20-twigs^{-1} with marigold, compared to 12.5 larvae 20-twigs^{-1} in sole pigeonpea during 1994/95).

Similarly, there is scope to introduce postrainy season pigeonpea as a companion crop to black gram under rice fallows. Collaboration with ICRISAT can identify genotypes suitable for late sowing in postrainy season which can establish and grow rapidly under high initial soil-moisture conditions.

Effect of Plant Population on Yield and Yield Components in Main and Ratoon Crops of Pigeonpea in Sri Lanka

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An optimum plant population is one of the most important components of any production package to optimize yield. In Sri Lanka, both determinate and indeterminate pigeonpea cultivars are becoming popular among farmers, and the production package recommended in India has been adopted. Since the two environments differ widely in temperature, photoperiod, and rainfall, and pigeonpea phenology is known to be influenced by these factors, it is necessary to determine an appropriate plant population for optimizing yield in the dry areas of Sri Lanka. This paper reports the results of population response study of an indeterminate cultivar ICPL 2.

The experiment was conducted during 1990/91 maha (rainy), and yala (postrainy) seasons. Eight plant populations of the following densities and spacings were established: 4 plants m^{-2} (60 × 40 cm), 8 (60 × 20), 11(45 × 20), 17 (30 × 20), 22 (45 × 10), 33 (45 × 20), 44 (30 × 10), and 66 plants m^{-2} (30 × 5 cm) spacings. The experiment was sown on a flat seed bed in RCBD with two replications on 22 Nov 1990. Each plot measured 20 m^2 in area. One plot of the treatment (44 plants m^{-2}) was severely affected by waterlogging at the seedling stage and, was deleted from the experiment. Within each plot five healthy plants were randomly selected for recording data from main (rainy season) and ratoon (postrainy season) crops. Data on grain yield, plant height, pod weight, and number of primary branches, clusters, pods and nodes were collected from single plants while data on plot yield and plant mortality were recorded from whole plots. The main crop was harvested on 14 Mar

Table 1. Yield and yield components of pigeonpea cultivar ICPL 2 in varying plant populations in main (M) and ratoon (R) crops, Maha Illuppallama, Sri Lanka, rainy and postrainy seasons 1990/91.

		Population (plants m^{-2})									
Trait	Crop	4	8	11	17	22	33	66	x	SE	CV (%)
Yield (t ha^{-1})	M	1.55	1.40	1.44	1.77	1.71	1.86	1.68	1.630	± 0.28	17.1
	R	1.01	0.91	1.29	1.93	1.03	0.91	1.10	1.168	± 0.44	37.3
Yield (g plant^{-1})	M	31.60	17.00	18.70	16.70	18.40	8.00	6.60	16.700	± 2.22	13.3
	R	38.30	22.20	26.60	22.60	27.20	14.20	13.70	23.820	± 7.70	32.3
Primary branches	M	9.80	8.60	8.90	8.80	11.00	8.60	5.70	8.470	± 1.32	15.6
	R	6.50	5.30	4.30	5.30	4.20	3.00	3.60	4.600	± 0.85	18.5
Clusters plant^{-1}	M	91.90	53.20	47.80	40.20	45.10	21.40	16.20	45.100	± 7.71	17.1
	R	91.50	90.00	62.50	58.00	47.50	37.00	46.00	61.800	±14.77	23.8
Pods plant^{-1}	M	141.00	86.00	84.00	77.00	76.00	37.00	25.00	74.800	±18.70	25.0
	R	220.00	113.00	177.00	132.00	130.00	72.00	54.00	127.900	±44.60	34.9
Plant height (cm)	M	160.00	161.00	164.00	168.00	181.00	159.00	165.00	165.400	± 5.60	3.40
	R	125.00	141.00	147.00	149.00	136.00	145.00	126.00	138.400	±22.00	15.90
Nodes plant^{-1}	M	33.60	33.70	29.80	32.20	33.30	26.40	25.50	30.640	± 2.64	8.60
	R	21.10	26.10	22.90	22.40	26.50	30.30	25.90	25.310	± 4.49	22.30
Plant stand	M	39.00	68.00	93.00	159.00	198.00	305.00	336.00	171.100	±59.70	34.90
	R	35.00	46.00	79.00	111.00	143.00	136.00	203.00	107.200	±27.30	25.50
Pod mass (g)	M	57.40	31.70	36.50	32.20	33.40	18.30	15.10	32.070	± 7.80	24.30
	R	67.50	35.00	49.30	40.50	34.20	22.10	21.10	38.520	±11.40	29.70
Plant mortality (%)	R	10.60	33.40	16.20	30.30	29.00	55.80	39.00	30.590	± 8.63	28.20

1991 by pod picking and at the onset of postrainy season rains it was ratooned at a height of 45 cm. Four sprays of Lannate® (18 EC) were applied to control pod-boring insects in the main crop while in the ratoon crop three sprays of monocrotophos were given to control podfly and pod borers. The main crop received one inadvertent irrigation while the ratoon crop was grown under rainfed conditions. The ratoon crop was harvested on 13 Jul 1991.

Data recorded on yield and yield components in different treatments are summarized in Table 1. The coefficient of variation for all traits studied was higher for ratoon crop than for the main rainy-season crop. Mean yield of the main crop (1.68 t ha^{-1}) was higher than that of ratoon yield (1.17 t ha^{-1}). In each season, however, the differences among the populations were nonsignificant suggesting a high degree of plasticity in cultivar ICPL 2. At the recommended spacing (33 plants m^{-2}) the main crop yield was 1.86 t ha^{-1} followed by 1.77 t ha^{-1} at 17 plants m^{-2}. In the ratoon crop highest yield of 1.93 t ha^{-1} was recorded at 17 plants m^{-2}. Lower yield in the ratoon crop was found to be related to the plant mortality. In general, high plant populations suffered higher plant mortality. This could be due to competition for moisture in the postrainy season. Individual plant yield in the main crop was lowest (6.6 g $plant^{-1}$) at the highest plant population, and highest (31.6 g $plant^{-1}$) at the lowest population. Between 8–22 plants m^{-2}, variation for plant yield was very low. Mean individual plant ratoon crop yield was higher than the main crop yield. The variation in the ratoon crop for yield $plant^{-1}$ among the populations was nonsignificant. At higher plant populations, where individual plant yields were 6–8 g $plant^{-1}$ in the main crop, a considerable increase was observed in their ratoon crop yield. This could be associated with the ability of plants to grow bigger in size than the main crop due to more space available in the ratoon crop because of plant mortality. Although the yield in the ratoon crop was higher than the main crop on a plant basis, the loss caused by plant mortality could not be fully compensated.

Plants in the main crop were taller than the ratoon crop, though the differences among the populations for plant height were nonsignificant in both the seasons. Similar trends were observed for the number of nodes on the main stem of the plants. Mean and the variation for the number of primary branches was higher in the main crop than the ratoon crop. The number of pods, number of pod-bearing clusters, and pod mass were higher in the ratoon crop, and these factors directly contributed to higher individual plant yield recorded in the ratoon crop.

Considering the importance of ratoon crop in the production package recommended for dry areas of Sri Lanka it appears that a plant population of 17 plants m^{-2}, on about 50% fewer plants per unit area than currently recommended, would be optimum for realizing high yield in the main as well as ratoon crop in indeterminate cultivars like ICPL 2.

Effect of Pigeonpea Genotypes, Plant Population, and Sowing Pattern in Pigeonpea/Rice Intercropping under Rainfed Conditions in Orissa, India

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In Orissa, upland constitutes about 45% of the total arable land. Seventy percent of such land is rainfed, on which rice is the principal crop during the rainy season. In spite of considerable precipitation, the crop is often exposed to intermittent dry spells of varying duration during the active period of crop growth, resulting in low yield. Many researchers working on dryland farming strongly suggest that upland rice be substituted by some other crop. However, most of the farmers are not willing to stop growing upland rice, because of habit.

Recently, intercropping of pigeonpea with rice has been recognized as a potentially beneficial system of crop production. Besides many agroeconomic advantages, intercropping is considered advantageous in the context of increasing demand and because it provides better and regular employment to family labor (Koshta and Karanjkar 1986). Success of an intercropping system depends on a judicious combination of plant populations of the component crops, and the adoption of an appropriate sowing pattern. But information is scarce on these aspects, especially under the agroclimatic conditions of Orissa. Hence, the effect of pigeonpea genotypes, plant population, and sowing patterns in pigeonpea/rice intercropping system was studied.

The trial was conducted at the Central Research Station of the Orissa University of Agriculture and Technology, Bhubaneswar, Orissa, India, during the 1993 rainy season. The soil was sandy loam with 5.8 pH, 0.46% organic carbon; 20.5 kg ha^{-1} available P_2O_5; and 162.5 kg ha^{-1} K_2O. Fifteen treatments consisting of one sole crop of rice (cv Parijat), two sole crops of pigeonpea (cv UPAS 120 and ICPL 87), and two sowing patterns of pigeonpea (uniform and paired) along with 3 row ratios of rice for each cultivar of pigeonpea were