

## EFFECT OF POPULATION SIZE AND SPATIAL ARRANGEMENT IN A NEW ERECT COMMON BEAN GENOTYPE (*Phaseolus vulgaris* L.)

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In breeding projects, erect type genotypes have been systematically eliminated in competition with prostrated type genotypes. This happened because erect and prostrated types have been tested with the same population size and spatial arrangement whatever plant ecotypes.

The aim of this project is to maximize yield on a new erect genotype (type II) with closed angle in branches insertion stem.

A factorial field experiment was carried out in split randomized blocks with five replicates. The treatments were: distance between rows: 45 or 22,5 cm; seed density: 10 or 20 seeds per linear meter; fertilization: 500 or 1000 kg/ha (8-28-16).

The erect genotype was developed by the brazilian company "FT-Pesquisas e Sementes Ltda" (FT -Research and Seeds Ltd).

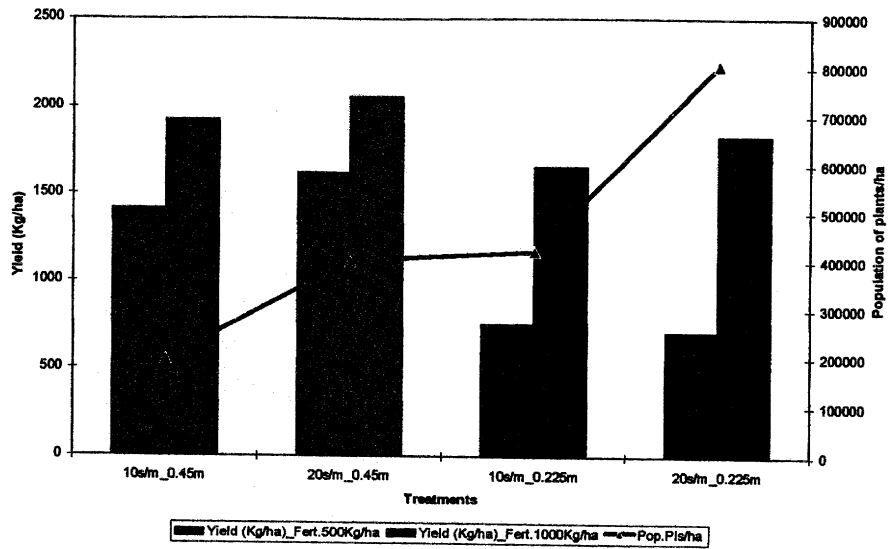
According to Table 1, fertilizer was the main limiting factor, mainly at 22,5 cm between rows, because of the competition among plants.

**Table 1.** Seed density, distance between rows, fertilizer level, yield and weight of 100 seeds of an erect genotype of common.

Treatment	Seed density (Seed/meter)	Distance between Rows (meter)	Fertilizer level (Kg/ha)	Yield (Kg/ha)	Weight of 100 seeds (g)
1	10	0.45	500	1416	18.1
2	10	0.45	1000	1928	17.8
3	20	0.45	500	1621	17.7
4	20	0.45	1000	2060	18.4
5	10	0.225	500	753	14.4
6	10	0.225	1000	1662	18.4
7	20	0.225	500	704	14.9
8	20	0.225	1000	1832	18

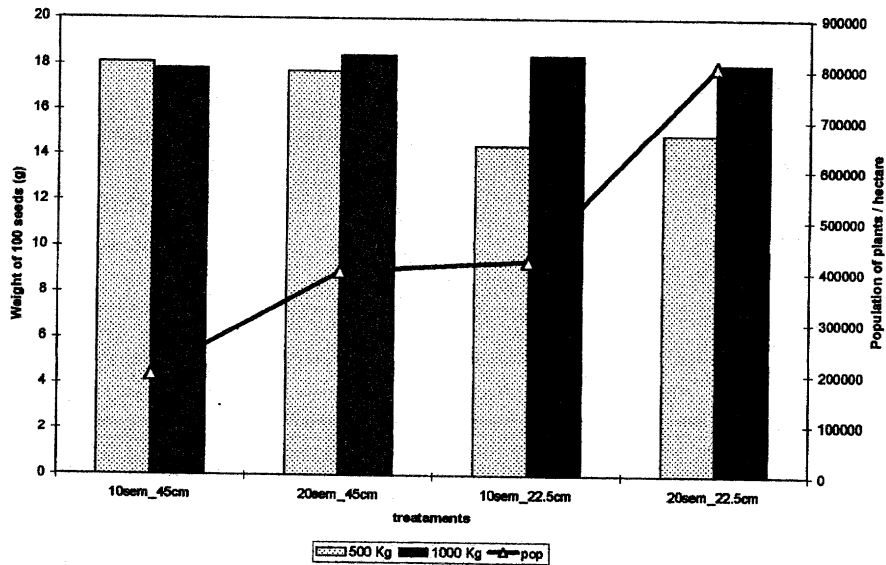
Considering the same population size with about 400.000 plants per hectare (treatments 3, 4, 5 and 6), it is possible to maximize yield changing spacial arrangement. The maximal yield was obtained with 20 seeds per meter and 45 cm between rows. This means that, beside fertilization level, the productivity is linked to the number of seeds sowed per linear meter. The lowest productivity was obtained with low distance between rows and low fertilization level (Figure 01).

Yield (Kg/ha) of Erecta Genotype with diferents fertilizer levels, seed density and distance between rows.



Whatever the spatial distribution, the weight of 100 seeds was the same for highest fertilization (Figure 2). Similarly to yield, the low distance between rows decreased the weight of 100 seeds (Figure 2).

Effect of distance between rows, seed density and fertilizer levels in Weight of 100 seeds (g)



According to the results, in the environmental conditions tested, the new erect genotype produced more with high level of fertilization and 20 seeds per linear meter. However, additional spatial arrangement must be tested for this genotype.