

IMPROVEMENT OF LARGE WHITE SEEDED DRY BEAN CULTIVARS FOR RESISTANCE TO NEMATODES IN THE PERUVIAN COAST¹

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The Root-Knot nematodes are broadly distributed in the Coastal areas of Perú and cause economical losses in beans (*Phaseolus vulgaris* L.). All the existing commercial varieties are susceptible to these nematodes being *Meloidogyne incognita* (Kopoid and White) Chitwook the main species; and less important *M. Javanica* in some bean areas in the Departments of Ica and La Libertad (2). In 1985, a breeding program began at the Chincha Agricultural Experiment Station to incorporate nematode resistance into large seeded yellow, white and brown dry beans (45 g/100 seeds). Three sources of resistances were used: NemaSnap, a variety introduced from the United States whose resistance comes from PI 165426, a Mexican introduction (3,4). G 2587 (PI 313789) and G 6278 (Manoa Wonder), Mexican collections obtained from CIAT. None of these sources were compatible in crosses with local varieties and the plants died in F1; in contrast, they combined easily with improved lines. The populations were planted in naturally infested fields with a population of 45 to 92 larvae/100 cc soil; all the populations were planted replicated twice to insure nematode attack. The number of root-knot galls were used as the selection criterium; and were evaluated at the physiological maturity using the Winstead and Sasser 1-5 scale. In each generation, the plants showing 1-2 reading were massively selected. In F5, individual selections were made based on field and number of root-knot galls; the same were evaluated in F6 and F7 for root-knot nematodes as well as for resistance to bean common mosaic virus, rust and oidium. The best combinations were obtained from the crosses between NemaSnap and the improved lines CIFEM 690 and CIFEM 691 (Now a released variety named "Blanco Laran"). Adaptation and Yield trials of these lines in soils highly infested in several localities of the Central Coast (Cañete, Chincha e Ica), indicated that the best 5 lines (NEMA: 89004, 89014, 89022, 89061, and 89069) were 233% superior in yield to Blanco Larán and this variety suffered a field reduction of 73%. (Table 1). In nematode-free fields theses lines yield as much as Blanco Larán, which has a yield potential of 2500 Kg/ha. In addition, The NEMA lines have resistance to BCMV, rust and oidium. They are white-large-grain-seeded (45-50 g/100 seed), indeterminate bush type (type IIa), and a growing period of 110-115 days to harvest.

Key words: *Phaseolus vulgaris* L; Breeding, Selection, *Meloidogyne*, Resistance.

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Table 1. Grain Yield (Kg/ha) of the best 5 bean white-nematode-resistant genotypes under field conditions in 3 localities in the Central Peruvian Coast - Chincha, Perú

Identification	Without nematodes	With nematodes
	Chincha	Cañete/Chincha
NEMA 89004	1566	1609
NEMA 89014	1650	1631
NEMA 89022	1658	1908
NEMA 89061	1644	1902
NEMA 89069	2015	1621
Average of 5 Best Lines	1687	1734
Variety BLANCO LARAN (Check)	1920	520
Difference with respect to Check(%)	-12	233
Yield Reduction by Nematodes (%)	72.9	