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ROOTING DEPTH COMPARISON BETWEEN *Phaseolus vulgaris* and *P. acutifolius*

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Previous trials (BIC Ann. Rep. 1980 23:75 and 1981 24:61) indicated that teparies may be more deeply rooted than common beans when each is drought stressed. Additional field and pot tr als were conducted in 1981 to further investigate root depths.

July 27, 1981, white PVC pipe pots, 150 cm tall, 15 cm diam., were planted with two tepary lines, PI 321638 and PI 319443, and two common bean cultivars, Masterpiece and Small White 53, 10 pots of each cv., one plant per pot, and placed outside in full sun. The pots were watered to capacity before planting, then the soil was kept moist by light daily watering until emergence. After that, no more water was applied. On Sept. 24, 1981, the tubes were dismantled and the maximum root length measured *in situ*. There was a highly significant difference in mean maximum root depth for the common beans compared to the teparies. The mean for each line was: PI 321638, 152.00 cm; PI 319443, 156.10 cm; Masterpiece, 120.44 cm; Small White 53, 102.00 cm. In addition, most tepary plants produced pods, but only one common bean plant did.

A second tall pot trial was conducted in the greenhouse from Nov. 9, 1981 to Jan. 6, 1982, using PI 321638, Masterpiece, BC_1F_2 seed from the interspecific hybrid between these two lines, and F_4 seed from the same hybrids. This test showed no significant differences in maximum root length, probably due to lack of sufficient drought and heat stress during the winter months, so that in this trial both species were able to grow well.

1980 field data indicated that tepary roots penetrated at least 180 cm, but common beans succumbed to charcoal rot long before the end of the season. Therefore, a second trial was conducted in 1981 at the same location, but the field was fumigated June 9, with 50:50 methyl bromide:chloropicrin prior to planting.

The field was planted July 9 with 3 tepary lines, PI 321638, L172 and PI 310801, and 3 common bean cultivars, Pinto UI 114, Gloria Pink, and Dark Red Kidney, in a randomized complete block design with 4 reps. The field was irrigated for 48 hours after planting but received no further irrigation and only 0.08 cm rainfall. Measurements were made with a neutron depth moisture probe at 30 cm intervals to 180 cm depth every week for six weeks, then every other week for two more measurements.

Again the common beans did not survive the season, this time they succumbed to lesser cornstalk borer (*Elasmopalpus lignosellus*) infestation. Although the teparies were also infested they had better survival rates than the common beans; 61% of PI 321638, 28% of PI 310801, and 55% of L172 plants survived the season. The surviving plants all showed damage by corn borer, so although they are tolerant, they are not resistant. Rooting depth estimates were again incomplete for the common beans, but the teparies appeared to extract water as deeply as in the previous season, i.e. to at least 180 cm.