

DETERMINATION OF PHYSICAL SUITABILITY OF ADVANCED DROUGHT TOLERANT BEAN LINES FOR CANNING

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Abstract (C2010)

Water uptake, percent volume increase and cookability after soaking are critical characteristics of dry beans destined for the canning industry. New dry bean varieties released, should possess good canning qualities to ensure uniform and complete water uptake in order to prevent further expansion of beans in the can. This study determined the physical suitability of 8 new lines for the canning process. These were randomly selected from 150 new advanced drought tolerant dry bean lines. The physical attributes evaluated were the initial moisture content, bulk density, water uptake, volume increase and cookability. The 8 bean genotypes of diverse market classes were screened for water uptake by soaking the beans for 16 hours at room temperature ($20.5 \pm 0.5^\circ\text{C}$). The effect of soaking on volume change was determined by heptane displacement method in a graduated container. Cookability was determined by the cooking time using a 25-well Mattson pindrop cooker. All experiments were replicated three times. Mexican 142, a popular canning bean variety, was used as the control. Analysis of 8 market classes showed that there were significant differences ($P < 0.05$) in initial moisture content, bulk density and cooking time among the genotypes. Initial moisture content varied from $10.00 \pm 0.10\%$ (DNB 11-10) to $11.87 \pm 0.12\%$ (Kenya Early); bulk density from $0.710 \pm 0.003 \text{ g/cm}^3$ (DNB 11-10) to $0.769 \pm 0.003 \text{ g/cm}^3$ (DSS 11-04) and cooking time from 30.31 ± 5.60 minutes (DPC 11-05) to 51.29 ± 13.6 minutes (DNB 11-10). However, there were no significant differences in water uptake and volume change. All genotypes took up at least 90% water and qualify for canning purposes, with six of them picking up water and cooking faster than the control.

Key words: Dry bean, canning, water uptake, cooking time, genotypes