

**ABSTRACT****Selection of High Performance  
Onion (*Allium cepa* L.) Cultivars for Barbados****Frances Louise Chandler**

A methodology was developed to test advanced onion germplasm for suitability to the climatic and ambient storage conditions of the Caribbean with the objective of replacing the poor storing cultivars currently grown with high performance cultivars, thereby extending the availability of the locally produced crop. Fifty eight commercially available short and intermediate day cultivars were evaluated, and ten cultivars with year round bulbing potential were selected.

The Israeli hybrid cultivar Grandstand was further selected based on its characteristics of early maturity and favourable yield and storage performance in the two major seasons. This favourable storage performance was not found to be related to high pungency, dry matter and firmness, which are reportedly associated with long storage.

Black mould caused by *Aspergillus niger* was the primary source of bulb losses in storage, and white cultivars were particularly susceptible. Bulbs with well sealed, thin necks showed superior storability to those with thick necks, which were particularly susceptible to soft rot caused by *Erwinia* sp. Losses from

disease were higher than those from desiccation, suggesting that under the climatic conditions of Barbados, it is likely that the regulation of storage conditions to minimize rotting would be more beneficial.

The number of dry outer scale leaves retained during storage was correlated with bulb storability. Small bulbs tended to store better than larger bulbs, and there was some evidence that an optimal bulb size for extended storage life may exist. This needs further investigation.

Solar drying of bulbs in a protected environment was superior to field drying when bulbs were stored for up to eight weeks. Solar drying was particularly beneficial for extending the storage life of larger bulbs.

There are few reports in the literature of growth studies on bulbous crops, particularly under tropical conditions. The current study confirmed the inherently low relative growth rate of the onion plant reported by Brewster (1977), and the rate was lower than that reported under temperate conditions. The technologies developed in the current study have been incorporated into a strategy for the optimisation of commercial onion growing, and have been transferred to other islands in the Eastern Caribbean using the "networking" and "Task Force" approaches. This has resulted in the transformation of the cultivars grown commercially from poor storing cultivars to the high performance cultivars Grandstand and Arad on 90 per cent of the acreage being grown. The availability of locally produced onions in Barbados has been extended from 5 months (1980) to 10 months (1991).