

Research
Paper

Genetic improvement of yellow onion (*Allium cepa* L.) for bulb development

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ABSTRACT

The present investigation was undertaken during late *Kharif* of 2003-03 with an objective to develop new yellow onion genotypes (from parental population of cv. PHULE SUVARNA by open pollination synthetic lines) variability for all floral and seed character. The study revealed that the rapid bulb development was noticed in selected population at all various crop stages (75-110 DAT) over parental population and showed significant difference in average performance and variability. Similarly, all bulb character of selected population showed improvement over parental population by displaying different performance and variability between two population. More importantly export oriented bulb production of yellow onion was noticed in selected population with mean of equatorial bulb diameter 6.34 cm and mean bulb weight of 206.18 g.

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Key words : Genetic, Genotypes, Hetrozygosity, Plant height, Leaves

INTRODUCTION

Maharashtra is the leading onion (*Allium cepa* L.) growing state accounting for 25 per cent total production (1661.0 thousand tones) and 16 per cent of the total area (84.48 thousand ha). India is the second largest producer of onion with an area of 454.6 thousand ha and production 6034.25 thousand MT (Anonymous, 2005). Onion is predominately a *Rabi* season crop of India but in Maharashtra it can be grown year round under wide range of climatic condition, Phule Suvarna is basically a *Rabi* season variety developed by Mahatma Phule Krishi Vidyapeeth, Rahuri. Especially for exporting yellow onion bulb are generally harvested in the month of March to April (Anonymous, 1997).

However, onion export initiates from December onwards, therefore, *rangda* onion cultivation can be exploited for export. However, cv. PHULE SUVARNA is a moderately susceptible to pre-mature bolting during late *Kharif* season, hence, it was important to manipulate the cv. PHULE SUVARNA genetically so that improved strain can be suitable for late *Kharif* season.

MATERIALS AND METHODS

The investigation was carried out at the Instructional

cum Research Farm, Department of Horticulture, Mahatma Phule Krishi Vidyapeeth, Rahuri (M.S.) during late *Kharif* 2002-03. The plot selected for the experiment had a uniform soil depth and fertility. The soil was light to medium black and well drained. Selection of promising genotypes of yellow onion was done especially suitable to late *Kharif* (*i.e. rangda*) season. Selection pressure was applied at two stages on desirable horticultural traits particularly for *rangda* season such as controlled vegetative growth coupled with rapid bulb development, bigger bulb size and resistance against premature bolting and twin bulbs. Accordingly, initially on the basis of plant growth characters, 250 seed bulbs were selected from plant population of one lakh bulbs and thus, 0.25 per cent selection pressure was applied on original plant population. However, at bulb harvesting stage from 250 initial selection only 25 seed bulb finally selected to advance bulb crop on the basis of desirable bulb character such as natural top fall, thin bulb neck, shape and size of bulb. However, to maintain brode genetically and hetrozygosity of onion crop, random mating of initially selected 250 bulb was allowed during seed production programme.

During late *Rabi* season, these seed bulb were planted on 19th January, 2003 and seed production was undertaken in isolation where random pollination or sib