adoption of I_2 irrigation level compared to I_1 was 9.6 per cent.

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GENETIC VARIABILITY IN ONION

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ABSTRACT

Studies on genetic variability in onion exhibited significant differences among the ecotypes for most of the characters except for shape index indicating high magnitude of variability. The estimates of phenotypic coefficient of variation were high as compared to genotypic coefficient of variation. Very high values for heritability were observed for the characters, volume of bulb (96.50 %) followed by bulb yield (91.62%). All other characters showed high heritability except for pyruvic acid content (14.99%). The characters like weight of plant, bulb length, bulb diameter, volume of bulb and bulb yield per plant recorded very high heritability estimates coupled with high genetic advance guiding for improvement of these characters by selection.

KEY WORDS : Variability, heritability, genetic advance, onion

Onion (*Allium cepa* L. var. aggregatum Don.) is an important vegetable cum condiment growth throughout the tropical and subtropical belt of the world. The production and demand of onion is relatively high and India is one of the leading exporters of onion. The crop is cultivated in different parts of the country due to its wide genetic diversity. This variability is of immense importance to the onion breeder as well as onion industry. Because of the high degree of cross pollination, such genetic variation exists in this crop and various studies on onion varieties showed that there were significant differences among the varieties with respect to yield and other characters. Partitioning of overall variability into heritable and non-heritable effects will help in developing a suitable breeding programme. Hence the present investigation was undertaken to estimate the magnitude of genetic variability in various onion cultivars.

MATERIALS AND METHODS

The material for the present investigation comprised of 20 onion ecotypes. These were grown

Table 1. Range of phenotypic variation, GCV,PCV, heritability, genetic advance as % of mean, general mean, coefficient of variation (CV), genotypic variance and phenotypic variance for different characters in onion cultivars

Characters	Range	GCV (%)	PCV (%)	Herita-bility (%)	Genetic Advance as % of mean	General mean	Coeffi-cient of variation (%)	Genotypic variation (%)	Pheno-typic variance (%)
Plant height (cm)	33.60 - 49.07	9.25	10.44	78.51	16.89	39.57	4.84	3.66	4.13
Leaf length (cm)	31.61 - 46.84	9.73	11.11	76.62	17.55	37.31	5.37	3.63	4.15
Leaf breadth (cm)	1.58 - 2.43	10.03	13.49	55.26	15.37	2.02	9.02	0.20	0.27
Number of leaves	13.40 - 24.80	9.23	11.19	68.05	15.70	18.73	1.60	3.11	3.77
Weight of plant (g)	35.09 - 75.65	33.89	35.77	89.75	66.21	49.53	1.92	11.75	12.41
Number of bulbs	4.40 - 5.80	7.58	8.46	80.34	14.01	4.96	3.75	0.38	0.42
Bulb length (cm)	2.90 - 4.00	12.30	30.07	88.63	23.88	3.46	4.41	0.43	0.46
Bulb diameter (cm)	1.50 - 2.50	14.23	16.10	78.14	25.94	2.00	7.53	0.28	0.32
Shape index	1.60 - 1.94	7.48	10.06	55.18	11.45	1.73	8.52	0.04	0.06
Volume of bulb (ml)	2.34 - 5.81	29.15	29.81	95.60	58.76	3.81	6.25	1.11	1.14
Days to maturity	82.40 - 89.00	1.73	2.47	49.13	2.51	86.73	1.76	1.50	2.15
Bulb yield (g)	27.57 - 56.20	34.85	36.41	91.62	68.79	37.61	4.62	7.88	8.23
Harvest index	70.95 - 80.97	3.98	4.59	75.49	7.14	76.17	2.12	2.60	2.99
Storage life (days)	17.00 - 23.80	6.57	8.90	54.39	9.98	21.13	6.01	1.39	1.88
TSS (%)	14.60 - 18.20	6.48	9.82	43.57	8.82	16.28	7.38	1.06	1.60
Ascorbic acid (mg/100 g)	7.21 - 8.80	5.50	6.61	69.34	9.45	7.64	3.66	0.42	0.51
Pyruvic acid (moles/g)	2.19 - 2.92	4.84	11.58	14.99	3.58	2.56	10.68	0.12	0.30

in a randomized block design with three replications at the University Orchard, Faculty of Agriculture, Annamalai University, Annamalai Nagar during 1996-97. The crop was raised during March and usual cultural operations were carried out to ensure a good crop. Observations were recorded on plant height, leaf length, leaf breadth and number of leaves at harvest, weight of plant, number of bulbs, bulb yield, bulb length, bulb diameter, shape index, volume of bulb, days to maturity, harvest index, storage life, TSS, ascorbic acid and pyruvic acid. The genotypic and phenotypic coefficients of variation, heritability and expected genetic advance were calculated employing routine methods.

RESULTS AND DISCUSSION

The statistical analysis revealed highly significant differences among the varieties for all characters except shape index. The range of phenotypic variation, general mean, coefficient of variation, genotypic variance, phenotypic variance, genotypic coefficient of variation, genotypic coefficient of variation, phenotypic coefficient of variation, heritability and genetic advance as percentage of mean are presented in Table 1. It was observed that varieties exhibited wide range of variability for morphological characters. However, the range of variability was narrow in respect of biochemical characters. The observations on the variability in respect of bulb yield per plant and TSS were closely related to those reported by Padda *et al.*, (1973), Randhawa *et al.*, (1974), Suthanthira Pandian and Muthukrishnan (1979) and Padmavathy (1995).

It could be inferred from the tabular representation that the highest genotypic and phenotypic coefficients of variation for bulb yield per plant and weight of plant paves way for the improvement of these characters through selection. The phenotypic coefficient of variation was of higher magnitude than that of genotypic coefficient of variation. This is in proximity with the findings of Patil *et al.*, (1986). During the present investigation, values of genotypic coefficient of variation for biochemical characters were comparatively lesser than those for morphological characters.

Heritability studies indicated that pyruvic acid content recorded low estimates of heritability with low genetic advance. The characters like weight of plant, bulb length, bulb diameter, volume of bulb and bulb yield per plant exhibited comparatively high heritability estimates with high value of genetic advance due to additive gene effect leaving

a scope for improvement of these character by adopting suitable selection procedures. Other characters could be worked upon through hybridization as they exhibited high heritability estimates with low genetic advance. The high heritability for TSS as per the present study is in accordance with the earlier reports by Padda *et al.*, (1973) and Patil *et al.*, (1986). The value of heritability for pyruvic acid was observed to be low (14.99 per cent).

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EFFECT OF IRRIGATION LAYOUTS UNDER VARYING IRRIGATION REGIMES ON LABLAB VARIETIES

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ABSTRACT

Field experiments were conducted during monsoon (1991) and summer (1992) at the Tamil Nadu Agricultural University, Coimbatore to study the effect of different irrigation levels and irrigation layouts on lablab varieties (*Lablab purpureus* var. *typicus* (L) sweet) Co. 11 and Co.12 to get maximum returns. The results revealed that the irrigation treatment 0.6 IW/CPE recorded higher number of green pod yield and haulm yield under both the seasons. Among the irrigation layouts, paired (double) row furrow with a spacing of 90/2x15 cm performed better and among varieties, Co.12 was better than Co.11.

KEY WORDS : Irrigation regimes, irrigation layouts, green pod yield, WUE

Protein deficiency is a common phenomenon in India. Majority of people in the country meet their protein requirement from pulses. Irrigation management for water economy is important. The immence need for manifold increase in the yield of pulse vegetables, opens a new vista on efficient water use. Lack of scientific water management practices for pulse vegetables necessitates this study as more valid. Scheduling of irrigation to meet the crop demand will improve the efficiency of this scarce water resource. Finding suitable irrigation layout as well as interval to use the water economically without affecting the yield is essential. Selection of suitable variety to get higher yield and income is also necessary to be evaluated. In this context an attempt has been made to combine the effect of various layout as well as intervals of irrigation to enhance the water use efficiency of lablab.

MATERIALS AND METHODS

The field experiment was conducted during monsoon 1991 and summer 1992 in field No.36 of the Tamilnadu Agricultural University Farm, Coimbatore. The soil of the experimental site was sandy clay loam and sandy loam with less in available nitrogen, medium in available phosphorus and high in available potassium. Experiment was laid out in strip plot design with three replications accommodating irrigation regims in vertical strips