above period. The compound growth rates estimated for quantity and value of total marine product and prawn export showed a decrease of 2.47 per cent and 2.01 per cent respectively. This reduction may be attributed to the competition from other exporting countries and/or satisfying the quality standards prescribed by United States of America.

CONCLUSION:

Shrimp continues to be India's main stay of foreign exchange earnings. India's percentage contribution of world export of fish and fishery products in terms of value increased to 1.7 per cent in 1986 from 1.2 per cent in 1973. This indicates that there is considerable scope to expand the export trade. Hence moderniation of processing plants by liberalising import policies to import sophisticated machineries and providing tax concessions to processors to encourage them to stay in the business will boost up the export trade of fishery products.

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INFLUENCE OF SEASON ON YIELD AND QUALITY ATTRIBUTES OF SEED IN CHILLI (*Capsicum annum* L.)

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ABSTRACT

The number of seed per fruit was more in rabi that kharif. Among the pickings the number of seed per fruit was higher in third and first pickings respectively in rabi and kharif. The recovery of large size seed (G_1) was more in kharif than rabi. Among pickings the highest recovery of G_1 was from the third picking and small size seed (G_3) was from last picking. The mean weight of seed obtained from the rabi season was higher than krarif. Seeds from the first picking recorded the maximum weight and that from last picking was minimum. The influence of season on germination was significant only in G_1. In general earlier pickings recorded higher germination than those from later pickings.

INTRODUCTION

Environment influences will be different on different characters of a seed. Low temperature may influence seedlessness (Charles *et al.*, 1979). Highest temperature during seed production exerted profound influence on fruit set and seed quality. Significant correlation was obtained between fruit size and number of seeds per fruit under high and low temperature (Rylski, 1973). Fruit set in capsicum was not affected by RH levels whereas increasing RH increased the seed set. The general seed yield and seed weight were greater from plants grown in short days (Studencova, 1965). Hence, it is imperative to undertake studies on the seasonal influence on fruit length, seed number, seed weight and seed quality in chillies.

Table 1. Influence of season on length of fruit (cm) and number of seeds per fruit from six pickings in cv. K 2 Chilli

		Length of fruit in cm				No. of seed per fruit			
		S_1	S_2	S_3	Mean	S_1	S_2	S_3	Mean
Pi.	I	5.5	5.7	6.1	5.8	55.2	53.2	65.9	58.1
Pi.	II	5.7	6.5	6.0	6.1	57.2	50.6	60.4	56.1
Pi.	III	6.5	6.9	6.9	6.7	60.2	50.8	51.6	54.1
Pi.	IV	6.1	6.5	5.9	6.2	55.4	54.3	50.5	53.4
Pi.	V	5.1	5.8	5.4	5.4	54.3	52.5	51.6	52.8
Pi.	VI	5.0	5.1	5.3	5.1	53.5	50.2	50.4	51.4
Mean		5.7	6.1	5.9		56.0	51.9	55.1	
			S	Pi.	S x Pi.		S	Pi.	S x Pi.
SEd			0.02	0.04	0.06		0.75	1.06	1.83
CD (P = 0.05)			0.05	0.07	0.12		1.50	2.12	3.80

MATERIALS AND METHODS

During rabi, 1984 (S_1) and kharif 1985 (S_2) and 1986 (S_3) Genetically from cv. K 2 chilli seeds were raised in a nursery. In a well prepared field of 0.2 ha in each season constituting five replications the 35 days old chilli seedlings were transplanted adopting an uniform spacing of 45 x 30 cm. Recommended packages of practices were adopted. The red ripened fruits were harvested in six pickings (Pi. I to PI. VI) with an interval of 15 days starting from 90th day after planting.

At the time of each picking 10 fruits were picked at random in each replication and the length of the fruit was measured and number of seeds per fruit was counted and the mean value was constituted.

The seeds were extracted manually from dried fruits and were size grades using 9/64" and 8/64" round per forated sieves to obtain three grades large seeds (G_1) ratained by 9/64", medium (G_2) retained by 8/64" and small (G_3) passed through 8/64", percentage of recovery was counted and the seeds were germinated from each grade as per ISTA (1985).

RESULTS AND DISCUSSION

Length of fruit: The mean length was longest in S_2 followed by S_3 and S_1. The fruit length was significantly less in rabi than kharif season.

The mean length increased from Pi. I to Pi. III and thereafter decreased. In all the pickings excent Pi. I and Pi. VI the length was longer in S_2 than S_3 or S_1. In all the seasons Pi. III and Pi. VI recorded the longest and shortest fruits respectively.

Number of seeds per fruit: The mean number of seed was significantly more than S_1 than S_2 or S_3. The number decreased gradually from Pi. I to Pi. VI than the differences between in two apparent pickings were not significant. In S_1 the number of seeds increased and then decreased. All the pickings excent Pi. III were on par. In S_2, the number of seed was highest in Pi. IV and lowest in PI. VI. In S_3, Pi. I recorded the highest number and was significantly superior to other pickings.

Recovery of size grades of seeds

Among the seasons, the recovery of G_1 and G_2 was significantly high in S_3 and S_1 respectively in all the pickings. The recovery

ble 2. Influence of season on the percentage recovery of size grades of seeds from six pickings in cv. K 2 Chilli

	G_1				G_2				G_3			
	S_1	S_2	S_3	Mean	S_1	S_2	S_3	Mean	S_1	S_2	S_3	Mean
I	45.3 (42.3)	58.2 (49.7)	66.2 (54.4)	56.6 (48.7)	45.3 (42.3)	23.6 (29.0)	28.1 (32.0)	32.3 (34.6)	9.4 (17.8)	18.2 (25.2)	5.7 (13.8)	11.1 (19.4)
II	48.2 (43.9)	61.3 (51.5)	66.8 (54.8)	58.8 (50.7)	47.0 (43.2)	23.3 (28.8)	27.7 (31.8)	32.7 (31.8)	4.3 (12.6)	15.4 (23.1)	5.5 (13.5)	8.6 (17.0)
III	44.6 (41.9)	70.5 (57.1)	73.9 (59.2)	63.0 (52.5)	36.3 (37.0)	23.5 (30.3)	20.6 (26.9)	26.8 (32.7)	19.1 (25.9)	6.0 (14.1)	5.5 (13.5)	10.2 (18.6)
IV	30.1 (33.2)	56.1 (48.5)	60.4 (51.0)	48.9 (44.3)	50.8 (45.4)	26.0 (30.6)	28.0 (31.9)	34.9 (36.2)	19.1 (25.9)	17.9 (25.0)	11.6 (19.9)	16.2 (23.7)
V	25.9 (30.5)	50.0 (45.0)	54.2 (47.4)	43.4 (41.2)	45.3 (42.5)	36.2 (36.9)	41.0 (39.8)	40.2 (39.3)	28.3 (32.1)	13.8 (21.8)	11.0 (19.3)	17.7 (24.8)
VI	24.5 (29.6)	30.4 (33.4)	32.4 (34.7)	29.1 (32.6)	45.1 (42.1)	39.7 (39.0)	52.0 (46.1)	45.6 (42.4)	30.4 (33.4)	33.3 (35.2)	15.6 (23.2)	27.4 (31.5)
an	36.4 (37.1)	54.4 (47.5)	59.0 (50.1)	90.0 (45.0)	44.6 (41.9)	28.7 (32.3)	31.8 (34.3)	35.0 (36.0)	19.0 (25.8)	17.4 (24.6)	9.2 (17.6)	15.2 (22.9)

	S	Pi.	G	S x G	S x Pi.	Pi. x G	S x Pi. x G
	0.35	0.49	0.35	0.60	0.85	0.85	1.48
(P = 0.05)	0.71	0.97	0.71	1.39	1.67	1.67	2.90

e 3. **Influence of season on 100 seed weight (mg) of size grades of seeds from six pickings in cv. K 2 Chilli**

	G_1				G_2				G_3				Mean
	S_1	S_2	S_3	Mean	S_1	S_2	S_3	Mean	S_1	S_2	S_3	Mean	
I	667.8	580.3	628.5	625.5	637.5	561.3	603.0	600.6	502.3	461.8	486.3	483.5	569.9
II	633.3	540.3	593.8	589.1	617.5	521.3	527.0	555.3	478.5	421.3	442.3	447.4	530.6
III	613.5	529.5	576.3	575.1	580.5	511.0	534.0	541.7	452.5	415.5	422.3	430.1	515.6
IV	614.8	520.5	573.8	569.7	572.3	493.3	492.8	519.5	438.3	397.8	421.8	419.3	502.8
V	595.5	503.8	554.8	551.4	540.3	451.5	462.5	484.8	418.3	361.5	407.8	395.9	487.4
VI	583.3	482.3	533.5	553.0	524.8	440.0	448.5	471.1	402.3	355.0	377.8	378.4	460.8
ean	619.0	526.6	576.9	574.2	578.8	496.4	528.0	534.4	448.7	402.2	426.4	425.8	

	S	Pi.	G	S x Pi.	S x G	Pi. x G	S x Pi. x G
Sd	1.27	1.80	1.27	3.12	2.21	3.12	5.40
D (P = 0.05)	2.50	3.53	2.50	6.12	4.32	6.12	10.59

able 4. Influence of season on germination (%) in size grades of seeds from six pickings in cv. K 2 Chilli

	G_1				G_2				G_3				Mean
	S_1	S_2	S_3	Mean	S_1	S_2	S_3	Mean	S_1	S_2	S_3	Mean	
i. I	94.5 (76.4)	85.5 (67.6)	91.0 (72.5)	90.3 (71.8)	91.0 (72.5)	87.3 (69.1)	89.5 (71.0)	89.3 (70.9)	80.3 (63.6)	78.8 (62.5)	80.0 (63.4)	79.7 (63.2)	86.4 (68.3)
i. II	93.3 (75.2)	84.0 (66.4)	92.5 (74.1)	89.9 (71.4)	92.0 (73.5)	82.5 (65.2)	90.5 (72.0)	88.3 (70.0)	82.3 (65.1)	79.0 (62.8)	80.8 (64.0)	80.7 (63.9)	86.3 (68.2)
i. III	93.5 (75.2)	82.0 (64.9)	85.5 (67.6)	87.0 (68.8)	82.0 (64.9)	78.8 (62.5)	77.0 (61.3)	79.3 (62.9)	78.5 (62.3)	77.2 (61.4)	75.2 (61.4)	77.0 (61.3)	81.1 (64.2)
i. IV	92.3 (74.1)	77.0 (61.3)	80.0 (63.4)	83.1 (65.7)	79.2 (62.8)	74.8 (59.8)	76.0 (60.6)	76.7 (61.1)	76.0 (60.6)	71.8 (57.9)	73.3 (58.8)	73.7 (59.6)	77.8 (61.8)
. V	85.3 (67.4)	75.3 (60.2)	75.3 (60.2)	78.6 (62.4)	79.0 (62.7)	72.0 (58.0)	73.0 (58.6)	74.7 (59.8)	73.2 (58.8)	70.0 (59.6)	71.0 (57.4)	71.4 (57.6)	74.9 (59.9)
. VI	81.3 (64.3)	73.3 (58.8)	74.3 (59.5)	76.3 (60.8)	75.0 (60.0)	72.3 (58.2)	72.3 (58.2)	73.2 (58.8)	72.0 (58.0)	69.8 (56.6)	71.0 (57.4)	70.9 (57.3)	73.5 (58.0)
ean	90.0 (71.5)	79.5 (63.0)	83.1 (65.7)	84.2 (66.5)	84.7 (66.9)	78.0 (62.0)	79.7 (63.2)	80.8 (64.0)	77.1 (61.4)	74.4 (59.6)	75.2 (60.1)	75.6 (60.4)	

	S	Pi.	G	S x Pi.	S x G	Pi. x G	S x Pi. x G
Ed	1.27	1.80	1.27	3.12	2.21	3.12	5.40
D (P = 0.05)	2.50	3.53	2.50	6.12	4.32	6.12	10.59

igures in parenthesis are transformed values)
= Non-significant

of G_3 was significantly low in S_3. The recovery of G_1 increased from Pi. I to Pi. III and then decreased. In all the seasons recovery of G1 recorded the highest in Pi. III and lowest in Pi. VI.

100 seed weight: The mean weight of G_1 and 7.4 per cent more than G_2. The weight of G_2 was 27.8 per cent more than G_3. Generally seed weight of different size grades was significantly more in S_1 than S_3 and S_2.

Irrespective of grades and seasons the weight was highest in Pi. I and lowest in Pi. VI. The weight showed a decreasing trend as the picking advanced.

The difference in 100 seed weight between grades of seeds among pickings was more between S_1 and S_2 than S_2 and S_3. The difference was high in G_1, less in G_2 and least in G_3.

Germination: Significant differences were obtained for G_1 alone in all the three seasons. Seed produced in S_1 recorded the highest germination than those from other two seasons. Among all pickings the germination grades Pi. I, Pi. II and Pi. III was on par in all the seasons and significantly more than Pi. II and Pi. VI.

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Germination: Significant differences were obtained for G_1 alone in all the three seasons. Seed produced in S_1 recorded the highest germination than those from other two seasons. Among all pickings the germination grades Pi. I, Pi, II and Pi. III was on par in all the seasons and significantly more than Pi. II and Pi. IV.

The length of fruit was more in the kharif than in the rabi season whereas the number of seed per fruit was more in the latter than in the former.

In the rabi season, number of seeds per fruit increased upto third picking and then decreased while the seed weight of all grades of seeds declined from the first picking onwards.

In the kharif season, the fruit length and the recovery of large size seed were more but the number of seed per fruit and the seed weight were less than the rabi indicating that more quantities of nutrients were utilized for the build up of seed size in the kharif whereas it was for seed weight in the rabi season. Environmental factors can greatly influence seed weight (Hodgkin, 1980). It is interesting to note that more the recovery of large size seed, the greater the 100 seed weight in all grades. And also, since seed size has exhibited positive association with seed weight, size grading of bulk seed will table care of weight grading also in this cron as has been reported in carrot (Austin and Longdon, 1967).

The recovery of G_1 was more in the first three pickings from the rabi cron than G_2 and vice versa in the remaining three pickings. Whereas in the kharif season, except the last picking, the recovery of G_1 was highest in all the pickings. Seed size variation within a plant has been reported in cotton (Thiagarajan, 1977) and carrot (Longdon, 1960). Variation in 100 seed weight in all the size grades were more in the kharif than the rabi season.

Seeds from rabi season recorded better germination than those from kharif. Differences in germination observed within large as well as small size seeds between seasons may be due to variations in material variations.

Abdalla and Vanderlipe (1972) and many other research workers reported positive association between seed size and germination. The difference in germination between G_1 and G_3 was not in proportion to that observed in seed weight between them. Therefore it becomes apparent the seed size and weight of seed are really depending upon the nutrition to mother plant whereas seed germination upon many factors of which nutrition may be one. In the present investigation germination was commparitively more in all size grades collected from the earlier than latter pickings. The early formed seeds may have the competitive advantage over the later formed ones (Hardesty and Elliot, 1956). This may be due to the environment in which the seeds developed and matured or due to the differences in the maturity of fruit at different pickings (Surilote and Rampal, 1967).

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PRE-TREATMENT METHODS TO CONTROL SEED DETERIORATION IN GINGELLY (*Sesamum indicum* L.) Cv. TMV 3

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Gingelly seeds stored under ambient conditions in cloth bag commenced deterioration at the fourth month of storage. Pre- treatments such as i) Hydration by soaking in water for 0.5 to 8.0 h. ii) Moisture equilibration in a saturated atmosphere for 2 to 96 h and iii) Iodine permeation in an iodine saturated atmosphere for 10 to 17 h were given to 4-month-old seeds followed by drying back to their original moisture in each case. The acceleratedly aged seeds (90% RH, 40°C for 15 days) revealed that 2 h soaking-drying, 24 h moisture equilibration-drying and 12h. iodine permeation- drying effectively controlled the further deterioration in seeds and registered high germination and vigour.

Viability studies in several crop seeds have shown that a low moisture content and

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