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CROP DAMAGE DUE TO CLIMATIC CHANGE: A MAJOR CONSTRAINT OF ONION FARMING IN CHANDWAD AND YEOLA TAHSIL. (NASHIK)

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ABSTRACT :

India is the second largest producer of onion in the world, but far behind of many countries in terms of productivity onion is among the most important horticultural crops grown worldwide for its culinary preparations and spicing food dishes. Besides being used as condiments, the medicinal properties of onion add value to its importance.

Maharashtra is a pioneer state in onion production contributing 25% of country's onion. To ascertain reasons for low productivity of onion, it was thought imperative to find out the constraints faced by farmers in respect of onion production. The data has been collected from total 100 farmers, 10 each from 10 villages from Chandwad and Yeola tahsils. It was found from the study that crop damage due to erratic rainfall at the time of harvesting of kharif onion and nursery

preparation of Rabi onion was the major constraint faced by 73% farmers. In the year 2010, monsoon was delayed by one month and afterwards there was continuous rainfall till November and 200-300 mm rainfall was recorded in onion growing states in the month of Oct-Nov which was unusual. In November, there were unseasonal heavy rains in many onion growing pockets of Maharashtra, which caused damage to onion crop in different stages. The erratic and untimely rains damaged the kharif, late kharif crop as well as rabi onion nursery. The kharif onion ready for harvest was affected by 30-40%, late kharif which was planted in Sept-Oct got affected by 15-20% and rabi nursery damaged by 20-25%. It has been observed that the kharif crop planted in flat beds, which is a regular practice by farmers, gets.affected by Anthracnose disease due to water stagnation. Bulb development was affected due to soil borne diseases like bulb rot, besides foliage damage by Colletotrichum. There is need for mass demonstrations of DOGR developed techniques of planting seedlings on raised bed (BBF) and irrigation through drip or sprinkler.

KEYWORDS:

Constraints; Climatic change; Onion production; Crop damage;

India is the second largest onion producer after China in the world, but far behind of many countries in terms of productivity. The of onion (16 t/ ha) is low as compared to USA (49 t/ha), Netherlands (35 t/ha) and China (22 t/ha). Maharashtra is leading state in area, production, productivity and export of onion. It is a pioneer state in onion production contributing 25% of country's onion. 90% of export augmented from Maharashtra alone amounting to Rs. 800-900 crores. The districts like Nashik, Pune, Ahmednagar, Satara, Solapur, Dhule, Nandurbar, Usmanabad, Aurangabad and Buldhana are leading in onion production. The rural people in these districts of Maharashtra are mainly engaged in onion farming which is

the major source of their income. The rapidly changing global marketeconomy , urbanization and growing need for value added products gradually changing subsistent agriculture to commercial agriculture. Extensive variability in quantity and distribution of rainfall causes severe crop damages and economic losses to farmers.

OBJECTIVES –

To study the climate changed impact on an onion farming in study region.

METHODOLOGY

The chandwad and Yeola two tahsilsof Nashik districts were selected for the study. Five villages were randomly selected from each tahsils. Ten farmers from each village were selected for the study on the basis of randomized sampling method. Questionnaireschedule has been developed by taking experts' views into consideration. The data has been collected with the help of pre-tested interview schedule from total 100 farmers, 10 each from 10 villages viz, Nimbale,Usavad, Daregaon, Vaki (B) and Dugaon from Chandwad and Nilkhede, Patoda, Andarsul, katarani and Deshmane from Yeola tahsil. Respondents were interviewed personally in their respective villages. The collected data was tabulated, statistical tools were applied, and interpretations were made in the light of objectives.

RESULTS AND DISCUSSION

It was revealed from findings (Table 1) that crop damage due to erratic rainfall was the top most problem faced by 76% farmers in chandwad tahsil. Other important constraints faced by onion growing farmers were labour shortage at the time of transplanting (74%), spurious seed supply from various companies (70%), lack of scientific knowledge of farmers (66%), and inability of farmers in maintaining isolation distance during seed production (58%).

Table 1. Constraints in onion production and post harvest management in chandwad tahsil

Sr. No.	Constraints	Freq. (N=50)	%	Rank
1	Inability to maintain isolationdistance during seed production	29	58	V
2	Spurious seed supply from seed companies	35	70	III
3	Weed problem	26	52	VI
4	Labour shortage at the time of transplanting	37	74	II
5	Fertilizer shortage	16	32	X
6	Unavailability of insecticides, pesticides and herbicides in time	9	18	XIII
7	Unable to control pest and diseases	17	34	IX
8	Lack of scientific knowledge about field operations	33	66	IV
9	Crop damage due to erratic rainfall	38	76	I
10	Non scientific way of grading and packaging	7	14	XIV
11	Non scientific storage structure	19	38	VIII
12	More cost involved in transportation	10	20	XII
13	Market price fluctuation	22	44	VII
14	Less marketable share due to bolters, twin bulbs, etc	19	38	VIII
15	Competition in the market	12	24	XI

Source: Tabulated by Researcher

It was observed from findings (Table 2) that heavy rainfall at the time of harvesting of kharif onion and nursery preparation of rabi onion causes crop damage was the major constraint faced by 70% farmers of Yeola tahsil. The problems like labour shortage (68%), supply of spurious seed (66%), poor scientific

knowledge of farmers about field operations (62%) and their inability in maintaining isolation distance while seed production (46%) were the other important constraints.

Table 2. Constraints in onion production and post harvest management in Yeola tahsil

Sr. No.	Constraints	Freq. (N=50)	%	Rank
1	Inability to maintain isolationdistance during seed production	23	46	V
2	Spurious seed supply from seed companies	33	66	III
3	Weed problem	20	40	VI
4	Labour shortage at the time of transplanting	34	68	II
5	Fertilizer shortage	11	22	X
6	Unavailability of insecticides, pesticides & herbicides in time	7	14	XIII
7	Unable to control pest and diseases	11	22	X
8	Lack of scientific knowledge about field operations	31	62	IV
9	Crop damage due to erratic rainfall	35	70	I
10	Non scientific way of grading and packaging	5	10	XIV
11	Non scientific storage structure	14	28	VIII
12	More cost involved in transportation	8	16	XII
13	Market price fluctuation	19	38	VII
14	Less marketable share due to bolters, twin bulbs, etc	13	26	VIII
15	Competition in the market	9	18	XI

Source: Tabulated by Researcher

It was found from the study (Table 3) that crop damage due to erratic rainfall at the time of harvesting of kharif onion and nursery preparation of rabi onion was the major constraint faced by 73% farmers. Labour shortage at the time of transplanting (71%), spurious seed supply from seed companies (68%), lack of farmers' scientific knowhow about field operations (64%) and inability to maintain isolation distance during seed production (52%), etc were also the important constraints faced by the farmers. Beside these, weed problem (46%), market price fluctuation (41%), non scientific storage structure (33%), less marketable share from produce (32%), inability to control pest anddiseases (28%), fertilizer shortage (27%), competition in the market (21%), more cost involved in transportation (18%), unavailability of pesticides in time (16%), and non scientific way of grading and packaging (12%) were the other constraints faced by them.

Table3. Overall Constraints in onion production and post harvest management (N=100)

Sr. No.	Constraints	Percentage (%)	Rank
1	Inability to maintain isolationdistance during seed production	52	V
2	Spurious seed supply from seed companies	68	III
3	Weed problem	46	VI
4	Labour shortage at the time of transplanting	71	II
5	Fertilizer shortage	27	XI
6	Unavailability of insecticides, pesticides and herbicides in time	16	XIV
7	Unable to control pest and diseases	28	X
8	Lack of scientific knowledge about field operations	64	IV
9	Crop damage due to erratic rainfall	73	I
10	Non scientific way of grading and packaging	12	XV

11	Non scientific storage structure	33	VIII
12	More cost involved in transportation	18	XIII
13	Market price fluctuation	41	VII
14	Less marketable share due to bolters, twin bulbs, etc	32	IX
15	Competition in the market	21	XII

Source: Tabulated by Researcher

June to December is the production period for kharif onion, planting of seedlings of late kharif crop and raising nursery for rabi season. In the year 2010, monsoon was delayed by one month and afterwards there was continuous rainfall till November and 200- 300 mm rainfall was recorded in onion growing states in the month of Oct-Nov which was unusual. In November, there were unseasonal heavy rains in many onion growing pockets of Maharashtra, which caused damage to onion crop in different stages. The erratic and untimely rains damaged the kharif, late kharif crop as well as rabi onion nursery. The kharif onion ready for harvest was affected by 30-40%, late kharif which was planted in Sept-Oct got affected by 15-20% and rabi nursery damaged by 20-25% (NHRDF, 2010). Sowing of rabi nursery also got delayed in Maharashtra. It has been observed that the kharif crop planted in flat beds, which is a regular practice by farmers, gets affected by Anthracnose disease due to waterstagnation. Bulb development was affected due to soil borne diseases like bulb rot, besides foliage damage by Colletotrichum. Knowing this critical production gap, DOGR developed techniques of planting seedlings on raised bed (BBF) and irrigation through drip or sprinkler. Many farmers are adopting this practice and enhancing their onion productivity. Gadge, et.al. (2011) found cases of 10-12 tons/ha yield in flat bed, while 20-25 tons/ha was observed in the field of farmers who planted seedlings on raised beds and used micro-irrigation as per DOGR recommendation under same rainfall pattern.

ADAPTATION MEASURES FOR CLIMATE CHANGE IN ONION FARMING:

- Agronomic management of date of planting to escape periods of high rainfall.
- Planting on broad bed furrow (BBF) instead of traditional flat beds may reduce losses from flooding in kharif season.
- BBF planting coupled with drip irrigation can help to overcome drought and salinity conditions.
- Irrigation by micro-sprinklers can avert the micro temperature in summer season by reducing effect of high temperature on bulb development.
- Integrated pest management system control measures to the observed problem and also take a range of influencing factors including weather into account to cut cost on pesticides.
- Introduction of water saving techniques such as irrigation coupled with fertigation. Studies showed savings of 40% water, 30% labour, 30% nitrogen with yield increase of 15% by drip irrigation (NRCOG, 2003).
- Mulching with organic waste and bicolour polythene not only conserves moisture but control weed population and maintain soil temperature.

CONCLUSION

It was inferred from the study that crop damage due to erratic rainfall at the time of harvesting of kharif onion and nursery preparation of rabi onion was the major constraint faced by 73% farmers. Agricultural/ horticultural output gets directly or indirectly affected due to change in rainfall pattern. Aberrant weather conditions have always been unpredictable and often impairing realizable crop yields. Extensive rainfall, cloudy weather in kharif and late kharif season reduce crop yield up to 60-70%. The soil-borne and fungal disease build-up is very high during kharif season. Excessrainfall associated with poor drainage enhances soil- borne diseases. Developing varieties resistant/tolerant to aberrant weather conditions would be crucial in future. Innovative agronomic practices, viz., raised bed planting; micro-irrigation, fertigation, mulching, etc arepossible adaptation measures to climate change in onion. There is

need for mass demonstrations of these technologies by development departments to increase yield level of onion crop even in adverse climatic conditions.

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