

**RESEARCH ARTICLE :**

# Knowledge and adoption of recommended onion cultivation technologies by the onion growers in Buldhana district of Vidarbha region

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**SUMMARY :** Constraints Analysis is essential to induce knowledge and adoption of any growers. The present study was therefore, designed to ascertain the Constraint Analysis of Onion growers in Buldhana District. Result of this study revealed that near about half (46.67%) of the respondents comes under medium level of constraints severity index.. Similarly in case of the practice wise knowledge and adoption of the onion growers it was observed that there are various practices of onion crop about them respondents analysis of constraints like spraying of mallic Hydrazide, to identify major diseases of onion crop, plant protection measures against onion diseases, improved storage practices of onion, important intercultural operation recommended for onion crop, different storage methods of onion, plant protection measures against onion pests, irrigation water management and identification of major pests of onion crop. Hence, the study imply that the extension functionaries should arrange farm field school, Krishi melawa, training programme about onion crop production as well as result demonstration and cover the above explained constraints analysis areas of onion crops, that will also help for raising knowledge and adoption of this practices. While the studying the constraints majority of the respondents reported that they got low prices in market after immediate harvest and non availability of improved storage methods of onion bulb as well as irregular supply of electricity hence, the study suggest that Govt. should provide storage facilities near the vicinity and also provide remunerative prices as well as regular supply of electricity to the onion growers.

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## **BACKGROUND AND OBJECTIVES**

Onion is one of the most important bulbus vegetable and it is commonly grown in India from ancient time. It belongs to genus: *Allium* species: *Cepa*.

Total area under vegetable in Maharashtra is 611000 hectares and production is 7504 metric tones. Maharashtra has the largest area under onion and have a bumper production. The area under onion

cultivation is 415 lakh ha total production is 4905 metric tonnes. The per cent share in production of all India is 33 per cent. In Maharashtra, Nashik, Jalgaon, Ahmednagar, Pune, Sangli, Satara and Solapur are the major onion growing districts. The Nashik region in Maharashtra account 30 per cent of the total production (National Horticulture Board: 2010-11).

In case of Vidarbha region, it is considered as major vegetable crop. Total area under onion in Vidarbha region is 0.96 lakh ha and total production is 1.57 lakh tonnes. In Vidarbha region Amravati stands first in total production of onion. In case of Buldhana total area under onion cultivation is 2433.6 ha and total Production of 73 metric tonnes. (District Agricultural Office Buldhana: 2010-11)

The present storage capacity for onion is about 4.6 lakh tonnes. This is quite inadequate compared to our total production. Even most of the structures available are traditional and unscientific. If 40 % of the stocks are earmarked for scientific storage the potential for new storage structures is about 12.6 lakh tonnes. However, it has been projected by the Expert Committee on Cold Storage and Onion Storage that about 1.5 lakh tonnes on-farm capacity in production areas and 3.0 lakh tonnes capacity at APMCs and other market places are required in next 5 years. Thus, there remains a vast potential to be tapped.

Most of the farmers bring onion directly to the market after harvest as proper storage facilities are not available with them. The present storage capacities are quite inadequate and most of the available units are traditional and unscientific. Fearing losses, farmers usually unload their entire stock within a month of harvest. As a result, during this period prices rule very low due to glut situation. Thereafter, the rise in prices is quite rapid and sometimes wide fluctuations occur leading to dissatisfaction amongst the producers as well as consumers. To improve the situation, GOI desired to create appropriate storage structures for onion, both at farm level as well as at market places. It drew a capital subsidy programme for the infrastructure development in which a pivotal role has been assigned to NABARD for its successful implementation. It has been planned to create a storage capacity of 4.5 lakh tonnes of onion during 1999-2000 and 2000-2001 through capital investment subsidy programme. Subsidy to the extent of 25% of the investment cost subject to a maximum of Rs. 500 per tonne has been proposed to be routed through NABARD for the credit delivery system.

Maharashtra state produces 25-30 % onion of the total production of the country. Maharashtra state contributes about 80-85 % in the total onion export. Out of the total onion production in the state, 10-15% onion production is in Kharif season, 30-40% production is in Late *Kharif* and 50-60% production is in Rabi/Summer season.

The cultivation of onion, in Vidarbha region, is mostly concentrated in six districts *viz.*, Akola, Buldhana, Nagpur, Amravati and Yavatmal. Different varieties and technologies in onion, suiting to the need of the farmer of the region are evolved and recommended by the university to boost up the yield of onions.

## RESOURCES AND METHODS

The present study was carried out in Buldhana district of Vidarbha region in Maharashtra state. Out of thirteen Panchayat samiti three Panchayat samiti namely Khamgaon, Buldhana and Nandura were purposively selected because of larger area under onion crop in Buldhana district with exploratory design of social research. The list of villages having cultivation of onion crop was obtained from the office of three Panchayat samiti. Out of the villages included in the list of five villages per Panchayat samiti were selected purposively based on the criterion of maximum area under onion crop. The selected villages were namely Pimprigavali, Pimpalgaonraja, Palashbudruk, Dhorapgaon, Poraj, Deulghat, Ruikhed, Sakhali budruk, Padali, Birsingpur, Nimgaon, Dhanora budruk, Isabpur, Wadali and Narkhed.

From these selected villages, the list of onion growers who grew onion for last three years were obtained from village level worker and from the list obtained proportionate number of farmers per village was selected by adopting proportionate random sampling method. Thus, in all 150 onion growers were selected as respondents who constituted the sample for the purpose of present study.

Data were collected by contacting the selected farmers personally on their farms and homes, as per their convenience by using interview schedule. With the help of Sarpanch and village leader was taken for approaching to farmers. The data were collected from all the 150 farmers.

### Measurement of knowledge:

English and English (1961) defined knowledge as a

body of understood information possessed by an individual. Operationally knowledge has been defined as the body of understood information, possessed by respondents about various Onion cultivation practices. A teacher made knowledge test was developed to measure the knowledge of an individual respondents about the Onion cultivation practices, responses of the respondents were taken on two point continuum *i.e.* yes/no and numerical score of 1 and 0 was assigned, respectively. Obtained knowledge raw score were converted into knowledge index by using following formula :

$$\text{Knowledge index} = \frac{\text{Knowledge score actually obtained}}{\text{Maximum obtainable knowledge score}} \times 100$$

The respondents were categorized according to obtained knowledge index score with equal interval method as low (Upto 33.33), medium (33.34 to 66.66) and high (Above 66.66) level of knowledge of Onion growers.

**Measurement of adoption:**

Rogers (1983) defined adoption as the decision to make full use of innovation as the best course of action available. Adoption in present study was defined as actual use of various Onion cultivation practices by the selected farmers in Onion crops.

**OBSERVATIONS AND ANALYSIS**

The results obtained from the present study as well as discussions have been summarized under following heads :

**Farmers according to knowledge and adoption of recommended onion cultivation technologies by the onion growers :**

*Knowledge :*

The result of distribution of the farmers according to their level of knowledge about recommended onion cultivation practices.

It indicates from table 1 that majority of the farmers (80.67) belonged to medium category of knowledge. Only 10.66 per cent of the farmers were included in high knowledge level and 8.67 per cent were in low knowledge category. The farmers in general were thus, found to be in medium category in possession of knowledge about onion cultivation, storage and marketing practices. The above findings are in line with the observations Rathod (1999), Dudhate and Wangikar(2003).

**Table 1: Distribution of the respondents according to their knowledge level about recommended onion cultivation practices of onion**

Sr. No.	Category	Respondents (n=150)	
		Frequency	Percentage
1.	Low	13	8.67
2.	Medium	121	80.67
3.	High	16	10.66
		150	100.00

It is evident from table 2 that the distribution of the farmers were found to be completely aware about preparatory tillage operation like one ploughing and two harrowing and curing of bulb produced followed by knowledge about recommended time of planting of onion *i.e.* 1<sup>st</sup> week of January (97.33%), preparation of flat bed for planting of the onion seedlings in main field (98.00%), intercultural operations like weeding (96.00%), storage of onion bulb (93.33%), irrigation requirement (87.33%), occurrence of pests like thrips, jassida, aphids etc. (78.66%), age of seedlings for transplanting *i.e.* 6 to 7 weeks (75.33%) and harvesting stage (70.66%). A sizeable percentage of the farmers have knowledge about recommended FYM application *i.e.* 20-25 cartload/ha. (32.66%), seed rate /ha. *i.e.* 10-12 kg. (32.00%), recommended raised bed for raising seedling (22.66%), occurrence of diseases like Downey mildew, black mould etc. (19.33%), onion as intercrop (18.00%). it is noted that meager percentage of the farmers have knowledge about recommended spacing *i.e.* 12.5 cm\*10 cm (8.00%), recommended varieties like PKV selection, Phule safed, Agrifound dark red, Agrifound light red, Phule suvarna, Arka pitambar, etc. (06.00%), weedicide application like 2,4-D, baseline (16.66%), tip cutting of onion seedlings (1.33%), recommended biofertilizer treatment of *Azotobacter* for onion seedling (0.66%) and application of recommended fertilizer dose *i.e.* 100:50:50 kg NPK/ha (0.66%)

*Adoption :*

Adoption shows the present status of actual use of onion cultivation, storage and marketing practices by the onion growers. The distribution of the farmers according to the level of adoption of onion cultivation, storage and marketing practices.

It reveals from table 3 that majority of the farmers (73.33%) were included under medium category of adoption of onion cultivation, storage and marketing

**Table 2: Distribution of the respondents according to practice wise knowledge level of recommended cultivation practices of onion**

Sr. No.	Recommended cultivation practices	Respondents (n=150)	
		Frequency	Percentage
1.	Preparatory tillage operation(one ploughing, two harrowing)	150	100.00
2.	FYM application (20 to 25 cartload/ha)	49	32.66
3.	Recommended varieties (PKV selection, Agrifound dark red, Agrifound light red, Phule suvarna)	9	06.00
4.	Seed rate 10-12 kg/ha	48	32.00
5.	Recommended time of planting of onion (1 <sup>st</sup> week of January)	146	97.33
6.	Recommended biofertilizer treatment for seedling ( <i>Azotobacter</i> )	01	00.66
7.	Recommended seedbed for raising seedling (Raised bed)	34	22.66
8.	Age for seedling for transplanting (6-7 weeks)	113	75.33
9.	Preparation of bed for planting of onion seedlings in main field (Flat bed)	147	98.00
10.	Recommended spacing (12.5 cm* 10 cm)	12	08.00
11.	Tip cutting of onion seedlings	02	01.33
12.	Recommended irrigation requirement	131	87.33
13.	Weedicide application (2,4-D)	25	16.66
14.	Application of recommended fertilizer dose (100:50:50 kg NPK/ha)	1	00.66
15.	Intercultural operation (weeding)	144	96.00
16.	Onion as a intercrop	27	18.00
17.	Occurrence of the onion pests(thrips, jassida, aphids)	118	78.66
18.	Occurrence of the onion diseases (Downey mildew, Black mould)	29	19.33
19.	Harvesting stage(2 <sup>nd</sup> to 3 <sup>rd</sup> week of April)	106	70.66
20.	Curing of bulb produce	150	100.00
21.	Storage Practices on floor, on string, in Kandachal and Nashik method)	140	93.33

**Table 3: Distribution of the respondents according to their adoption level of onion cultivation practices**

Sr. No.	Category	Respondents (n=150)	
		Frequency	Percentage
1.	Low	17	11.33
2.	Medium	110	73.33
3.	High	23	15.34
	Total	150	100.00

practices. Whereas, 15.34 per cent in high and 11.33 per cent in low adoption category.

The adoption of various practices connected with onion cultivation, storage and marketing practices of onion growers were further ascertained practice wise.

It is observed from table 4 that majority of the respondent 53.33 per cent, 02.00 per cent, 98.00 per cent, 44.66 per cent, 09.33 per cent, 26.66 per cent, 0.66 per cent and 98.00 per cent, 03.33 per cent respondents have completely adopted the cultivation practices about seed rate per hectare, recommended time and dose of fertilizer application, recommended intercultural operation, plant protection measures against onion pests, FYM application, gradation of onion, spacing recommended for

onion crops, irrigation water management, plant protection measures against onion disease, respectively.

It is also interesting to note that not a single respondent were completely adopted spraying of malice hydrazine before 15 days of harvesting and adoption of improved storage practices for onion.

99.33 per cent, 80.00 per cent and 20.00 per cent of the onion growers were partially adopted the onion cultivation practices like spacing, FYM application and gradation of onion produce, respectively.

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**Table 4 : Distribution of the respondents according to practice wise adoption level about recommended cultivation practices of onion**

Sr. No.	Recommended cultivation practices	Adoption					
		CA	%	PA	%	NA	%
<b>A</b>	<b>Land preparation</b>						
1	Ploughing, harrowing	144	96.00	06	04.00	00	00.00
<b>B</b>	<b>Variety</b>						
2	White varieties : Akola safed, Pusa white flat, Phule Safed, Red Varieties : Basvant-780, Agrifound dark red, N-53, Yellow varieties : Phule- Suvarna, Arka-Pitambari	07	04.66	00	00.00	143	95.33
<b>C</b>	<b>Raising of seedlings</b>						
3	raising of onion seedlings in the month of October- November on Flat bed/BBF	0	00.00	150	100.00	00	00.00
<b>D</b>	<b>Seed rate</b>						
4	9-10 kg/ha	80	53.33	70	46.67	00	00.00
<b>E</b>	<b>Transplanting of seedlings</b>						
5	Seedling with 10-15 cm height and 6 to 8 week old probably 1 <sup>st</sup> forth night of January.	144	96.00	6	04.00	00	00.00
<b>F</b>	<b>Spacing</b>						
6	10 x 10 cm or 15 x 10 cm	01	0.67	149	99.33	00	00.00
<b>G</b>	<b>Intercultural operation</b>						
7	3 to 4 weeding or Before transplanting the seedlings on in main field spraying of Trifluralin @ 1 kg/ha with one weeding after 45 days of transplanting.	147	98.00	01	00.67	02	01.33
<b>H</b>	<b>Organic manure</b>						
8	40-50 cart load of FYM /ha.	14	09.00	120	80.00	16	10.67
<b>I</b>	<b>Fertilizer Application</b>						
9	100Kg N and 50kg P / Ha. Out of this 50kg N and 50kg P should be applied at the time of transplanting and remaining 50 kg N should be applied 30 days after transplanting.	3	02.00	119	77.33	28	18.67
<b>J</b>	<b>Irrigation water management</b>						
10	According to soil type, weather, crop stage irrigation should be given with 8-12 days interval.	147	98.00	03	02.00	00	00.00
<b>K</b>	<b>Plant protection</b>						
11	Protection from Pest: 1. Thrips: Spraying of Quinolphos 25EC, 12ml + 50 ml Triton/ Sandovit in 10 lit water after 2-3 weeks of seed sowing. 2. Jassids: Application of 20ml Dimethoate in 20 lit water for 1 ha. Area. area. 3. Onion fly: Mixing of Phorate 10EC @10kg/ha. at the time of tillage operations.	67	44.67	3	02.00	80	53.33
12	Protection from Diseases: 1. Wilt : Application of Thiram/ Captain @ 2gram/lit of water, 20-30 days after Sowing. 2. Blight: Mancozeb 2.5 gram/lit of water should be applied 10-20 days interval of sowing seed. 3. Onion rot: Mixing of Tricoderma 1250 gram/ 125kg of FYM at the time of last harrowing.	5	03.33	0	00.00	145	98.67
<b>L</b>	<b>Harvesting</b>						
13	Neck fall stage, yellowing of leaves, bulb stage, 180 days from seed sowing on main field.	113	75.33	37	27.67	0	00.00
14	Spraying of Malic Hydrazide 2000 PPM before 15 days of harvesting for avoiding sprouting in storage of onion.	00	00.00	00	00.00	150	100.00
<b>M</b>	<b>Curing</b>						
15	10-15 days for curing.	146	97.33	00	00.00	4	2.67
<b>N</b>	<b>Grading</b>						
16	Size(mm) Grade 55 to 60 Very large 45 to 55 Large 35 to 45 Medium 20 to 35 Small	40	26.67	30	20.00	80	53.33
<b>O</b>	<b>Storage Practices</b>						
17	Adoption of improved storage practices like on floor, on string, on Kandachal and Nashik method	146	97.33	0	00.0	4	2.67

CA=Complete Adoption, PA=Partial Adoption, NA=No Adoption

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