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**Jyoti M Patil**  
 PhD Scholar, Dept. of Extension  
 Education, PGI, Dr. PDKV,  
 Akola, Maharashtra, India

**NR Koshti**  
 Professor, Office In-Charge,  
 ARIS, PGI, Dr. PDKV, Akola,  
 Maharashtra, India

**VS Tekale**  
 Head, Dept. of Extension  
 Education, PGI, Dr. PDKV,  
 Akola, Maharashtra, India

**Corresponding Author:**  
**Jyoti M Patil**  
 PhD Scholar, Dept. of Extension  
 Education, PGI, Dr. PDKV,  
 Akola, Maharashtra, India

## Study on adoption of recommended organic soybean practices by the organic growers of Akola district

**Jyoti M Patil, NR Koshti and VS Tekale**

### Abstract

Vidarbha leads the way for organic farming. The present study was undertaken in four purposively selected talukas of Akola district of western Vidarbha. The data were collected from 200 organic soybean growers were selected randomly by following proportionate stratified random sampling method with the help of pre tested interview schedule. The basic input for achieving higher productivity is the adoption of recommended organic farm practices. It is generally observed that all respondents do not adopt all recommended organic soybean practices. Therefore, an appropriate understanding of the adoption level of the organic soybean growers about recommended organic farm practices would help to arrive at appropriate extension and research strategies to increase the knowledge level.

**Keywords:** Organic farming, soybean, organic farm practices, adoption

### Introduction

India has tremendous potential, largely untapped; for a major breakthrough in organic agriculture. India's organic area in 2005 was 0.186 million hectares and number of organic producers were 48,846 that has increased to 1.49 million hectare and organic producers were 5,85,200 in 2016. It is clear that the growth rate of organic agricultural area has increased.

In Maharashtra state development of agriculture has launched a massive program to popularize the organic farming practices in cereals, pulses and oilseed crops. The major emphasis of agriculture development is on transfer of technology of organic farming to the farmers land and adopted by them. The knowledge and adoption of innovation involve the farmers' capacity to acquire and understand information about technologies and the abilities to translate this knowledge into action.

In real perspective, organic farming is an ancient are of Indian agriculture practices, which is relevant even in this modern era of chemical dominated agriculture. The art of organic aims at judicious and scientific use of natural phenomena and resources for not only immediate gain but also for preserving them for the posterity.

Organic farming is gaining gradual momentum across the world. Growing awareness of health and environmental issues in agriculture has demanded production of organic food which is emerging as an attractive source of rural income generation. Organic agriculture has made a credible performance during the past ten years. Both, the 11<sup>th</sup> plan document on organic sector and the report of the National Commission on farmers have recommended it as a tool for second green revolution in the country in particular for agro-eco zones comprising rainfed areas, hilly areas and areas experiencing ecological backlash of green revolution. Organic agriculture can become low cost, sustainable option of farming in the country, particularly by the small farmers in rain fed areas and helps to improve their food and income security. It helps to produce and supply adequate safe and nutritious food to the producers and consumers of the nation. Environmental benefits, health aspects and farmers empowerment are other important factors influencing farmers to shift to organic agriculture. Some of the important benefits of organic farming are Organic fertilizers are completely safe and does not produces harmful chemical compounds.

Soybean (*Glycine max*) is known as the Golden bean and Miracle crop of the 20<sup>th</sup> century because of its varied uses. Maharashtra and Madhya Pradesh are the two major soybean producing states and currently contribute more than 80 per cent to the total area and production of soybean in India (Anonymous, 2012) [1].

**Objective**

To study the extent of adoption possessed by the organic soybean growers regarding recommended organic farm practices.

**Methodology**

The present study was undertaken in purposively selected Akola districts of Vidarbha region of Maharashtra state due to more number of farmers engaged in organic farming and especially in organic soybean cultivation. The study was conducted in four talukas in this district namely Patur, Akola, Murtijapur and Barshitakali selected purposively for deep study having highest concentration of organic soybean cultivators involved in organic soybean production. The data were collected from 200 organic soybean growers were selected randomly by following proportionate stratified random sampling method by conducting field survey and applied diagnostic research design of social research. The

researcher collected the information on knowledge and adoption of recommended organic soybean practices by the organic growers of Akola district with the help of pre tested interview schedule.

**Result and Discussion**

Rogers (1995) defined adoption as the decision to make full use of innovation in the best course of action available. Adoption is operationally defined as the degree of acceptance and use of the standardised organic soybean cultivation practices by the respondents.

The adoption level of respondents with respect to standardize organic soybean cultivation practices was studied through a structured interview schedule. The different categories and data of the farmers in context with practicewise adoption of standardize organic soybean cultivation practices are presented in the Table 1.

**Table 1:** Distribution of the organic soybean growers according to the practicewise adoption of standardize organic soybean cultivation practices

Sl. No.	Cultivation practices	Adoption		
		CA (2)	PA (1)	NA (0)
A. Soil				
i)	Type of soil in which you have sown soybean during last year	190 (95.00)	07 (03.50)	03 (01.50)
ii)	Type of soil is recommended for cultivation of Soybean (Medium to heavy soil having adequate drainage and pH range 6.5 to 7.5)	181 (90.50)	05 (02.50)	14 (07.00)
B. Land preparation				
i)	Adoption of tillage operations (Two to three harrowing after ploughing)	189 (94.50)	03 (01.50)	08 (04.00)
ii)	First harrowing before sowing of soybean (Jambhulwahi). (Beneficial for weed control)	195 (97.50)	02 (01.00)	03 (01.50)
iii)	Adoption of Summer ploughing in each year to destroy resting pest of soybean and exposing this stage to hot sunlight and predating bird	180 (90.00)	05 (02.50)	15 (07.50)
iv)	Adoption of rotation of soybean crop with other crops to avoid mono cropping	186 (93.00)	05 (02.50)	09 (04.50)
v)	Adoption of rotation with Soybean crop (Cereals Wheat)	193 (96.50)	03 (01.50)	04 (02.00)
C. Seed rate and variety				
i)	Names of improved varieties of Soybean recommended for cultivation in this area (JS-335, TAMS-38, TAMS-98-21, AMS-99-24, NRC-1)	187 (93.50)	05 (02.50)	08 (04.00)
ii)	Recommended seed rate per/ha for Soybean (75kg/ha) (Have you conducted seed germination test)	181 (90.50)	07 (03.50)	12 (06.00)
D. Time of sowing				
i)	Recommended time of sowing for Soybean crop (Last week of June to 15 July)	189 (94.50)	05 (02.50)	06 (03.00)
E. Sowing method				
i)	Adoption of proper method of sowing is recommended for Soybean (Drilling and Dibbling)	185 (92.50)	06 (03.00)	09 (04.50)
ii)	Best depth of sowing for Soybean (4cm.)	183 (91.50)	04 (02.00)	13 (06.50)
F. Spacing				
i)	Adoption of recommended spacing for Soybean (Row to plant distance is 30 x 8 cm. or 45 x 5 cm.)	184 (92.00)	07 (03.50)	09 (04.50)
ii)	Optimum plant population of Soybean (4 to 4.5 lakh/ha)	179 (89.50)	05 (02.50)	16 (08.00)
G. Seed treatment				
i)	Recommended biofertilizers for seed treatment ( <i>Rhizobium japonicum</i> , PSB, <i>Trichoderma</i> , etc)	197 (98.50)	02 (01.00)	01 (00.50)
ii)	Quantity of biofertilizers required for 10 Kg Soybean seed (250 gm/ 10 kg seed)	187 (93.50)	03 (01.50)	10 (05.00)
iii)	Seed treatment of soybean with Beejamrut	193 (96.50)	02 (01.00)	05 (02.50)
iv)	Any other method used for seed treatment (Eg. Chemical S-9)	198 (99.00)	01 (00.50)	01 (00.50)
H. Inter cropping				
i)	Crop recommended for intercrop in Soybean (Soybean and Red gram with 3:2 ratio)(4:2, 8:2, 10:2)	191 (95.50)	03 (01.50)	06 (03.00)
I. Intercultivation				
i)	Intercultivation practices related to soybean cultivation (Hoeing, hand weeding, etc)	185 (92.50)	04 (02.00)	11 (05.50)
ii)	Appropriate period required for weed free condition in Soybean (Up to 30 days)	178 (89.00)	02 (01.00)	20 (10.00)
iii)	Cleanliness of Soybean field to destroy weed which may act as collateral host of certain pest	172 (86.00)	05 (02.50)	23 (11.50)
iv)	Bio-herbicides recommended for control of weeds in Soybean crop (Most of time use preventive measures for weed control)	146 (73.00)	02 (01.00)	52 (26.00)
J. Manure/Compost application				
i)	Manure/compost used for application (Regular compost or Biodynamic compost)	184 (92.00)	06 (03.00)	10 (05.00)
ii)	Recommended dose of manure/compost per hectare (Apply FYM @ 5 to 7 tonnes/ha or Compost@ 5 to 7 tonnes/ha or Poultry manure @ 5 tonnes/ha or biogas slurry @ 12.5 tonnes/ha)	180 (90.00)	05 (02.50)	15 (07.50)
K. Water requirement				
i)	Most critical stages of irrigation for Soybean crop	180 (90.00)	09 (04.50)	11 (05.50)

	(It is a Kharif crop and hence largely dependent on rains If required give irrigation at the time of flowering and pod filling stage)			
ii)	Method of irrigation for use of water and recovery of Soybean crop (Sprinkler irrigation)	192 (96.00)	03 (01.50)	05 (02.50)
L. Plant protection				
i)	Major pests of Soybean (Girdle beetle, Stem fly, hairy caterpillar etc.)	180 (90.00)	04 (02.00)	16 (08.00)
ii)	Bio-pesticide recommended for control of pests (Spray 5% NSKE or spray Dashparni ark or spray Chilli-Garlic solution @ 75 gm/liter or spray cow urine, ash and dung mixture or 2 foliar sprays of BD 501)	170 (85.00)	05 (02.50)	25 (12.50)
iii)	Major diseases of Soybean (Bacterial Blight, Yellow mosaic virus, Rust, Wilt (Pod), etc)	189 (94.50)	04 (02.00)	07 (03.50)
iv)	Biological measure recommended for control of above disease (Disease control from sowing time is most important. Apply 1 kg Trichoderma mixed with compost per acre during field preparation, 2 foliar sprays of BD 501 and apply BD 500 at the time of field preparation, etc)	155 (77.50)	08 (04.00)	37 (18.50)
v)	Uprooting of unhealthy and viral disease plants and buried them in soil	182 (91.00)	05 (02.50)	13 (06.50)
vi)	Stage of infection of Girdle beetle and stem fly (Destruction of infested plant along with larval stage of girdle beetle and stem fly)	160 (80.00)	07 (03.50)	33 (16.50)
vii)	Stage of <i>Hairy caterpillar</i> and <i>Spodoptera litura</i> feeds gregariously (Their larva should be destroyed early by plucking infested leaves and destroy the egg masses of <i>Hairy caterpillar</i> and <i>Spodoptera litura</i> )	165 (82.50)	07 (03.50)	28 (14.00)
viii)	Setting of light trap	191 (95.50)	03 (01.50)	06 (03.00)
ix)	Setting of Pheromone trap (For early monitoring and controlling of <i>Spodoptera litura</i> @ 10 traps/ha)	198 (99.00)	02 (01.00)	00 (00.00)
x)	Conservation of biological control agents such as spider, lizard, praying mantid, tachnid fly, dragon fly, chrysoperla and grass hopper	174 (87.00)	06 (03.00)	20 (10.00)
xi)	Use of bio-pesticides ( <i>Nomouraera rileyi</i> and <i>Beauveria bassiana</i> )	163 (81.50)	07 (03.50)	30 (15.00)
xii)	Setting the erect bird perches @ 4-5/ha depend on pest population	197 (98.50)	03 (01.50)	00 (00.00)
M. Harvesting and Yield				
i)	Appropriate stage of harvesting of Soybean (When leaves start falling after yellowing and pod colour becomes brownish)	193 (96.50)	03 (01.50)	04 (02.00)
ii)	Best method of harvesting & storage of seed which is better for better germination	176 (88.00)	10 (05.00)	14 (07.00)
iii)	Speed (RPM) of machine used for threshing (Threshing with 3000 rpm)	168 (84.00)	15 (07.50)	17 (08.50)
N. Storage				
i)	Requirement moisture percentage for stored soybean seed (Not more than 10 to 12%)	185 (92.50)	05 (02.50)	10 (05.00)

Distribution of organic soybean growers according to the practice wise adoption about the standardized organic soybean cultivation practices in Table 1 revealed that majority of the organic soybean growers (99.00%) had adopted the other than regular method for seed treatment (Eg. Chemical S-9) and setting of Pheromone trap (for early monitoring and controlling of *Spodoptera litura* @ 10 traps/ha), followed by 98.50 per cent had adopted the recommended biofertilizers for seed treatment i.e. *Rhizobium japonicum*, *PSB*, *Trichoderma*, etc and setting the erect bird perches @ 4-5/ha depend on pest population, followed by 97.50 per cent had adopted the first harrowing before sowing of soybean i.e. also known as Jambhulwahi which is beneficial for weed control, followed by 96.50 per cent had adoption of rotation with Soybean crop, seed treatment of soybean with Beejamrut and appropriate stage of harvesting of Soybean i.e. when leaves start falling after yellowing and pod colour becomes brownish, followed by 96.00 per cent had adopted the method of irrigation for use of water and recovery of Soybean crop i.e. sprinkler irrigation. Majority of the organic soybean growers showing medium to high level of adoption to certain practices might be due to middle to young age, high education level, semi medium land holding, their experience in organic farming, medium extension orientation, etc. In the same manner respondents also shows low adoption towards certain practices might be due to less family members, more farming experience in traditional farming practices than organic farming practices, less frequency of training undergone and medium to low risk taking ability, etc.

The acceptance of a new idea is not a unit act but a complex process which involves a sequence of thoughts and actions. In other words, it can be stated as it is the mental process through which an individual passes from first hearing about an innovation to final adoption. Responses of the organic

soybean growers about their extent of adoption regarding fourteen major and forty two minor standardized organic soybean cultivation practices were collected. Practices wise right response were counted and converted in to score. These were finally summed up and on the basis of total score obtained by each of the organic soybean grower categorized as low, medium and high level of adoption. The different categories and data of the organic soybean growers according to their adoption are presented in the Table 2.

**Table 2:** Distribution of the organic soybean growers according to their level of adoption

Sl. No.	Adoption Category	Respondents (N=200)	
		Frequency	Percentage
1	Low (Up to 82.40)	15	07.50
2	Medium (82.41 to 95.76)	159	79.50
3	High (Above 95.76)	26	13.00
	Total	200	100.00

Mean = 89.08, SD = 06.68

The data presented in Table 2 clearly indicated that majority of the organic soybean growers (79.50%) had medium level of adoption followed by high (13.00%) level of adoption and low (07.50%) level of adoption.

Hence, from the results, it could be inferred that majority of the organic soybean growers (79.50%) had medium level of adoption about standardize organic soybean cultivation practices. The probable reason of this finding might be their middle to young age, higher education, medium experience in organic farming, medium level of extension orientation and different motives behind the organic farming.

The finding gets support to the research work done by Kanel (2005) [7], Patel (2005, b) [10], Singh (2005) [12], Sidram (2008) [11], Garg *et al.* (2009) [4], Jaganathan *et al.* (2009) [5], Pandya

(2010)<sup>[9]</sup>, Osari (2011)<sup>[8]</sup>, Badgujjar (2012)<sup>[2]</sup>, Jaiswal (2012)<sup>[6]</sup>, Chouhan (2013)<sup>[3]</sup> and S. Prasanth (2016)<sup>[13]</sup>.

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