

KNOWLEDGE AND ADOPTION BEHAVIOUR OF WAL (*DOLICHOUS LABLAB*) GROWERS IN RAIGAD DISTRICT OF MAHARASHTRA STATE

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Abstract: Pulses, called as a legume, constitute an important component in Indian agriculture from long time. The pulses are mini fertilizer factory which increases the soil fertility and also fix the atmospheric nitrogen in the soil. Wal (*Dolichous lablab*) is one of the important pulse crop cultivated in Konkan region. The study was undertaken to know the adoption behaviour of wal growers in Raigad district of Konkan region in Maharashtra state. Total 120 wal growers were selected through purposive sampling method from the selected district. The study revealed that more than fifty per cent cultivation practices were known to farmers in the study area. The adoption behaviour was found to medium level which can be increase by way of educating and motivating the farmers along with arrangements for supply of required inputs, proper techniques and implements/ machineries.

Keywords: Adoption behaviour, Wal growers, production technology

INTRODUCTION

Agriculture is a way of life of rural Indians. The development of agriculture depends upon the diffusion, knowledge and adoption of recent technological advances in agriculture. Pulses constitute an important component in Indian agriculture from long time. It is also called as a legume. The pulses also called as a mini fertilizer factory which increases the soil fertility and also fix the atmospheric nitrogen in the soil. Pulses are consumed as *Dal*, which is a cheap source of plant protein. These are consumed because of body building properties due to presence of various amino acids. These also have medicinal properties. By products of pulses like leaves, pod coats and bran are fed to animals in the form of dry fodder.

In Konkan region of Maharashtra wal (*Dolichous lablab*) crop cultivated in a *rabi* season. Raigad district has the highest area

under the this crop. In Raigad, the improved variety and package of practices of this crop were demonstrated through various Front Line Demonstration programmes by Dept. of Agriculture and Krishi Vigyan Kendra, Raigad. Therefore, a topic entitled "A study on adoption behaviour of wal growers in Raigad district" was planned to know practice wise knowledge and adoption of wal cultivation and adoption behaviour of wal growers.

METHODOLOGY

The present study was conducted in the Raigad district in Konkan region of Maharashtra state. From Raigad district, Mangaon division was selected on the basis of highest area under wal crop. Out of four tahsils of this division, Roha, Mangaon and Sudhagad-Pali tehsils were selected purposively because of the technology transfer programme implemented by the Dept. of Agriculture and KrishiVigyan Kendra of

the district. In consultation with Officials and extension personnel of the Mangaon division and KVK scientist, 4 villages from each tahsil and 10 farmers from each village were selected. The total sample size was 120 respondents. Data were collected by personal interview technique. The data were analysed, tabulated and result were interpreted in light of the objectives of study. The adoption behaviour was calculated on the basis of formula mention below.

$$\text{Adoption Index Score (AIS)} = \frac{\text{Total score obtained by the respondents}}{\text{Maximum score that could be obtained}} \times 100$$

RESULT AND DISCUSSION

With a view to find out the adoption behaviour of recommended wal production technology, the respondents were asked to give information about knowledge about package of practices and adopted technology. Data regarding this aspect given in Table 1 and Table 2.

The data regarding practice-wise knowledge of wal production technology presented Table 1 revealed that, majority of the respondents (83.33 per cent) were knowing about the improved variety 'Konkan wal-1' and 90.83 per cent respondents knowing the 'Konkan wal-2' variety. Majority (65.00 per cent) of the respondent had used the variety of 'Konkan wal-1'. Whereas, 'Konkan wal-2' variety had used by 89.17 per cent respondents.

Maximum (96.67 per cent) respondents knowing about the preparatory tillage operations 'one ploughing after harvesting of *kharif* crop' and more than three fourth of the respondents (79.16 per cent) knowing 'application FYM or compost 5 tons/ha'. Whereas, the tillage operation of 'collection of a residues of weed and stubbles of a previous crop' was known by 86.66 per cent respondents. The 59.17 per cent of the respondents were not doing 'one ploughing after harvesting of *kharif* crop' and 'Application FYM or compost 5 tons/ha'. Further it was seen that fifty per cent of respondents were doing the operation of 'collection of a residues of weed and stubbles of a previous crop' fully, whereas 27.50 per cent following it partially.

All the respondents were knowing about the 'use of quality seed', more than fifty (54.17 per

cent) respondents knowing the 'dibbling method of sowing'. Majority of the respondents (92.50 per cent) were knowing about the 'sowing behind the plough furrow method'. With respect to spacing, it was observed that 65.83 per cent respondents not knowing the 'spacing for dibbling method'. Whereas, 70.00 per cent respondents knowing the 'spacing for behind plough sowing'. Regarding seed rate for dibbling it was observed that 63.33 per cent respondents not knowing the seed rate for dibbling, but 77.50 per cent were knowing the seed rate for 'behind plough sowing'. In case of seed treatment 54.17 per cent respondents were known about the treatment with 'thiram and *rhizobium* culture'. The 83.33 per cent respondents not using dibbling method whereas 60.80 per cent respondents following behind plough sowing method which was in line with the knowledge level. In case of spacing 83.33 per cent respondents not following spacing for dibbling method. However, 37.50 per cent and 21.6 per cent respondents following spacing fully and partially for behind plough sowing method, respectively. Regarding seed rate, maximum (83.33 per cent) respondents not following seed rate for dibbling but 50.83 per cent respondents following seed rate for behind plough method. The data regarding seed treatment shows that 50.00 per cent respondents following seed treatments fully as per the recommendations whereas 15.83 per cent following partially.

Majority of the respondents (91.66 per cent) were knowing about the 'relay cropping method'. With respect to adoption of 'relay cropping' *i.e.* sowing should be done before the 15-20 days of harvesting of rice crop'. It was observed that 59.16 per cent of the respondent had 'fully' adopted. The 62.50 per cent respondents had not knowing this practice Regarding 'zero tillage sowing' *i.e.* after the harvesting of rice crop destroy the weed by spraying glyphosate @ 5 ml in one lit water 91.66 per cent of the respondents had not adopted. Majority of the respondents (85.00 per cent) were known about the 'recommended dose *i.e.* 25 kg N / ha and 50 kg P / ha at the time of sowing'. It was observed that 89.17 per cent of the respondent had not adopted and only 8.33 per cent respondents adopted the fertilizer dose partially.

Majority (60.00 per cent) of the respondents were knowing about the irrigation time *i.e.* 'first irrigation at flowering stage' and 54.17 per cent of the respondents were knowing about the 'second irrigation *i.e.* at the time of grain filling stage'. With respect to adoption of water management practices it was found that maximum (95.83 per cent) of the respondent had not followed it.

Majority (70.00 per cent) of the respondents were not knowing regarding 'spreading the layer of glyricidia as a mulching after the emergence of wal crop', whereas, only 30.00 per cent were knowing. The mechanical control *i.e.* 'hoeing should be done after 15 days of sowing' was known by 69.20 per cent respondents. 'Spraying of oxy-diazol (*Raft*) @ 120 gm in 600 lit of water as a pre emergence weedicide' and 'after the spraying of *Raft* the 2nd hoeing should be done after 25 to 30 days interval in two hoeing' were known by 66.67 per cent and 69.20 per cent respondents, respectively. Regarding *Cuscuta spp.* 50.00 per cent respondents having knowledge about deep ploughing followed by spreading of pendimethalin @ 1kg on the surface of soil by mixing with fine sand. The 25.00 per cent respondents partially following the practice of spreading the layer of glyricidia as a mulching @ 5 ton/ha and 22.50 per cent respondents partially following mechanical control. The adoption of chemical control measures for weed management was 2.50 per cent to 18.33 per cent full and partially respectively.

The 80.83 per cent of the respondents had knowledge about the 'collection and destruction of infested pod for control of pod borer'. In case of fruit borer and pod bug 55.83 per cent of the respondents knowing the 'use of light traps for control of fruit borer and pod bug', 23.33 per cent of the respondents were known about the 'use of H.N.P.V Virus', and only 40.00 per cent of respondents had knowledge about 'use of insecticides *i.e.* at the flowering stage spraying the crop with monocrotophos 36% E.C. 500ml or quinalphos 25% E.C. 1 lit or methyl parathion 2% wsp 25kg/ha. It was found that 43.33 per cent of the respondents had 'fully' adopted the technique of destruction of infested pod infested by pod borer. Only 20.83 per cent of the respondents had used light traps, and 8.33 per cent of the respondents had 'use of H.N.P.V virus for control of fruit borer and pod bug,

whereas 9.16 per cent and 36.66 per cent of the respondents had followed spraying technique fully and partially, respectively for control of fruit borer and pod bug.

All of the respondents knowing about the 'uprooting the infected plants', 95.83 per cent of the respondents knows about the 'seed treatment with thiram @ 2.5gm/kg of seeds' and 35.00 per cent of the respondents knowing about the 'drenching plant with 1per cent bordo mixture for the control of root rot'. In case of wilt disease, 45.00 per cent of the respondents knowing about the 'seed treatment with 0.1% carbendezim for 4 hours and drying in shade' and 34.17 per cent respondents knowing about the 'seed treatment with *Trichoderma harzianum* @ 25gm/kg of seeds'. The 58.33 per cent of the respondents had 'fully' adopted the technique of 'uprooting the infected plant' for control of root rot. Further 62.50 per cent of the respondents had followed 'seed treatment with thiram @ 2.5gm/kg'. However majority (90.00 per cent) of the respondents had not adopted the control measures 'drenching plant with 1per cent bordo mixture' for control of root rot. In case of wilt 76.67 per cent of the respondents had not followed 'seed treatment with carbendazim' and 95.83 per cent of the respondents had not followed 'seed treatment with *Trichoderma harzianum* @ 25gm/kg of seeds for control of wilt disease.

The cent per cent of the respondents well aware about its harvesting technique which is unique and easy to adopt. Majority (62.50 per cent) of the respondents had knowledge about the 'mechanical thresher'. And, all the respondents knows about the manual threshing followed after harvest of the crop. No any respondents had used mechanical thresher whereas threshing by manual way was done by all the respondents. All the respondents had knowledge about 'winnowing by hand' and majority (70.83 per cent) of the respondents knowing about 'winnowing by machine'. Only 12.50 per cent of the respondents used machine for winnowing the grains. Whereas cent per cent of the respondents had done winnowing by hand. All respondents had knowledge about the storage of grains *i.e.* sun drying of grains for 3 to 4 days and 91.67 per cent of the respondents were knowing about use of the ash in storage

Table 1: Distribution of the respondents on the basis of practice wise knowledge and adoption of wal production technology

Sl. No	Statements	Knowledge		Adoption		
		Yes	No	Full	Partial	No
1	Use of high yielding improved variety developed by DBSKKV, Dapoli					
1.1	Konkan Wal 1	106 (88.33)	14 (11.67)	78 (65.00)	00 (00.00)	42 (35.00)
1.2	Konkan Wal 2	109 (90.83)	11 (09.17)	107 (89.17)	00 (00.00)	13 (10.83)
2	Preparatory Tillage					
2.1	One ploughing after harvesting of <i>kharif</i> crop.	116 (96.67)	04 (03.33)	39 (32.50)	10 (08.33)	71 (59.17)
2.2	Application of FYM or Compost 5 ton / ha.	95 (79.16)	25 (20.83)	14 (11.67)	35 (29.16)	71 (59.17)
2.3	Collection of a residues of weed and stubbles of a previous crop.	104 (86.66)	16 (13.83)	60 (50.00)	33 (27.50)	27 (22.50)
3	Seed and Sowing					
3.1	Use of quality seed	120 (100.00)	00 (00.00)	120 (100.00)	00 (00.00)	00 (00.00)
3.2	Method of Sowing- Dibbling	65 (54.17)	55 (45.83)	19 (15.83)	01 (00.83)	100 (83.33)
	Behind plough furrow	111 (92.50)	09 (07.50)	73 (60.80)	29 (24.20)	18 (15.00)
3.3	Spacing For dibbling-30x15cm OR 30x20cm OR 30x30cm	41 (34.17)	79 (65.83)	18 (15.00)	02 (01.66)	100 (83.33)
	For behind plough sowing-30x15cm OR 30x20cm OR 30x30cm	84 (70.00)	36 (30.00)	45 (37.5)	26 (21.67)	49 (40.83)
3.4	Seed Rate For dibbling-30 to 45 kg /ha.	44 (36.67)	76 (63.33)	18 (15.00)	02 (01.66)	100 (83.33)
	For behind plough furrow- 50 to 60 kg /ha.	93 (77.50)	27 (22.50)	61 (50.83)	29 (24.16)	30 (25.00)
3.5	Seed Treatment 1-Treat the seed with thirum @ 3gm/kg of seed. 2-After that treat the seed with <i>Rhizobium</i> culture @ 25gm / 1 kg of seed.	65 (54.17)	55 (45.83)	60 (50.00)	19 (15.83)	41 (34.17)
4	Relay cropping Sowing should be done before the 15-20 days of harvesting of rice crop.	110 (91.66)	10 (08.33)	71 (59.16)	08 (06.67)	41 (34.17)
5	Zero tillage sowing After the harvesting of rice crop destroy the weed by spraying of glyphosate (@ 5 ml in one lit of water).Then sowing should be done by dibbling method.	45 (37.50)	75 (62.50)	00 (00.00)	10 (08.33)	110 (91.66)
6	Use of Fertilizer dose Apply 25 kg N and 50 kg P /ha at the time of sowing.	102 (85.00)	18 (15.00)	03 (02.50)	10 (08.33)	107 (89.17)
7	Water Management					
7.1	Give first irrigation at flowering stage.	72 (60.00)	48 (40.00)	05 (04.17)	00 (00.00)	115 (95.83)

7.2	And the second irrigation at the grain filling stage.	65 (54.17)	55 (45.83)	05 (04.17)	00 (00.00)	115 (95.83)
8	Weed Management					
8.1	After the emergence of wal crop spreading the layer of glyricidia as a mulching @ 5 ton / ha.	36 (30.00)	84 (70.00)	00 (00.00)	30 (25.00)	90 (75.00)
8.2	Mechanical control 1-Hoeing should be done after 15 days of sowing.	83 (69.20)	37 (30.80)	03 (02.50)	27 (22.50)	90 (75.00)
8.3	Chemical control Spraying of oxy-diazol (Raft) @ 120 gm in 600 lit of water as a pre emergence weedicide	80 (66.67)	40 (33.33)	03 (2.50)	22 (18.33)	95 (79.17)
8.4	After the spraying of Raft the 2 nd hoeing should be done after 25 to 30 days interval in two hoeing.	83 (69.20)	37 (30.80)	03 (02.50)	06 (05.00)	111 (92.50)
8.5	For the control of <i>Cuscuta spp.</i> deep ploughing followed by spreading of pendimethalin @ 1 kg on the surface of soil by mixing with fine sand.	60 (50.00)	60 (50.00)	12 (10.00)	12 (10.00)	96 (80.00)
9	Pest and their control measures					
A	Pod borer					
9.1	CM- In low infestation collection and destruction of infested pod.	97 (80.83)	23 (19.17)	52 (43.33)	28 (23.33)	40 (33.33)
B	Fruit borer and Pod bug					
9.1	CM- Using of light traps	67 (55.83)	53 (44.17)	25 (20.83)	00 (00.00)	95 (79.17)
9.2	CM- Using of H.N.P.V Virus	28 (23.33)	92 (76.67)	10 (08.33)	00 (00.00)	110 (91.66)
9.3	CM- In flowering stage spraying crop with monocrotophos 36% E.C. 500 ml or quinolphos 25% E.C 1 lit or methyl parathion 2% wsp 25kg/ha.	48 (40.00)	72 (60.00)	11 (9.16)	44 (36.66)	65 (54.16)
10	Diseases and their control measures					
A	Root rot					
10.1	CM- Uprooting of the infected plants	120 (100.00)	00 (00.00)	70 (58.33)	00 (00.00)	50 (41.67)
10.2	CM- Seed treatment with thirum @ 2.5 gm/kg.	115 (95.83)	05 (4.17)	75 (62.50)	30 (25.00)	15 (12.50)
10.3	CM- Drenching plant with 1% bordo mixture.	42 (35.00)	78 (65.00)	12 (10.00)	00 (00.00)	108 (90.00)
B	Wilt					
10.1	Soak the seeds in 0.1% solution of carbendezim for 4 hours then drying in shade and used for sowing.	54 (45.00)	66 (55.00)	18 (15.00)	10 (08.33)	92 (76.67)
10.2	Treat the seeds with <i>Trichoderma harzianum</i> @ 25gm/kg of seeds and used for sowing.	41 (34.17)	79 (65.83)	05 (04.17)	00 (00.00)	115 (95.83)
11	Harvesting					
11.1	Crop should be mature within 100 to 110 days after sowing.	120 (100.00)	00 (00.00)	120 (100.00)	00 (00.00)	00 (00.00)
11.2	Harvesting should be done by uprooting the crop. Or cutting the crop with the help of sickle close to the ground level.	120 (100.00)	00 (00.00)	120 (100.00)	00 (00.00)	00 (00.00)
12	Threshing					
12.1	Mechanical thresher.	75 (62.50)	45 (37.50)	00 (00.00)	00 (00.00)	120 (100.00)
12.2	Manual threshing	120 (100.00)	00 (00.00)	120 (100.00)	00 (00.00)	00 (00.00)
13	Winnowing					

13.1	By hand	120 (100.00)	00 (00.00)	120 (100.00)	00 (00.00)	00 (00.00)
13.2	By machine	85 (70.83)	35 (29.17)	15 (12.50)	00 (00.00)	105 (87.50)
14	Storage					
14.1	Before storage, sun drying the grains for 3 to 4 days.	120 (100.00)	00 (00.00)	120 (100.00)	00 (00.00)	00 (00.00)
14.2	Add/ use of ash in storage bin.	110 (91.67)	10 (08.33)	85 (70.84)	25 (20.83)	10 (08.33)

bins. The adoption of storage technique revealed all the respondents had 'fully' used the technique sun drying the grains for 3-4 days. Whereas 70.84 per cent of the respondents had used ash in grain storage bins.

Adoption behaviour of wal growers

The 'adoption behaviour' is a mental process through which an individual pass from first hearing of an innovation to its final adoption, while adoption is a decision to continue the full use of an innovation. Generally, the farmers do not adopt the package of practise fully. There is partial adoption also found in use of the technology. As a result, the gap is always appearing between the recommended production technology and their use at farmer's field. The 'adoption behaviour' of wal growers is presented in Table 2.

Table 2: Distribution of respondents according to their adoption behaviour

Sl. No.	Adoption behaviour (Score)	Respondents (N=120)	
		Number	Percentage
1	Low (Up to 39)	20	16.67
2	Medium (40 to 48)	85	70.83
3	High (49 and above)	15	12.50
Total		120	100.00
Mean= 44 (Score) S.D= 5			

The data presented in Table 2 revealed that, 70.83 per cent of the respondents had medium adoption behaviour of the selected agricultural technologies of wal crop, while 16.67 per cent and 12.50 per cent of the respondent had 'low' and 'high' adoption behaviour, respectively.

The average adoption score was 44. The findings were in line with the findings of Bhimawat and Gupta (2005), Sharma (2005) and Solanki (2009).

CONCLUSION

It could be concluded that most of the respondents had used Konkan wal-2 variety. All farmers were used the quality seed for sowing purpose. Most of the farmers used the Relay cropping method for sowing. All farmers have the knowledge of harvesting of wal crops in that most of the farmers has knowledge of manual threshing and adoption was found maximum. Wal growers had medium level of adoption behaviour of the selected agricultural technologies of wal crop. In other words, it can be said that there is scope to increase the adoption behaviour by way of educating and motivating the farmers along with arrangements for supply of required inputs, proper techniques and implements/ machineries.

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