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Knowledge level of farmers on No-till Maize Technologies in Guntur district of Andhra Pradesh

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ABSTRACT

Maize is the third most important cereal crop in India after rice and wheat. A study was conducted to know the knowledge level of farmers on no-till maize cultivation in Guntur district of Andhra Pradesh. The primary data was collected from 120 no-till maize farmers based on proportionate random sampling method representing 12 villages of three mandals during the year 2015-16 using structured interview schedule. The study revealed that majority (59.17%) of the no-till maize farmers had medium level of knowledge followed by high (25.83%) and low (15.00%) level of knowledge. Many of the no-till maize farmers had correct knowledge about the sowing practices, weed management, nutrient management and pest management practices.

Key words*: Knowledge level, No-till maize farmers, Technologies.*

In India, maize is cultivated in about 9.4 million ha with a production of 24.4 million tonnes and its productivity is 2.5 million tonnes per ha. Whereas in Andhra Pradesh maize is cultivated in 9.72 lakh ha area with a production and productivity of 48.13 lakh tonnes and 4951 kg/ha respectively. (2013-14). In Andhra Pradesh, Guntur district is one of the largest maize growing areas. The area and production under maize crop in this district is 82,043 hectares and 5.96 lakh tonnes respectively during 2013-14. (*Agricultural Action Plan, 2013-14).* Maize is the third most important cereal crop in India after rice and wheat. Rice (*Oryza sativa* L.) - Maize (*Zea mays* L.) is one of the pre-dominant cropping system of both command and non-command areas of Andhra Pradesh. The concept of zero-tillage is gaining momentum in traditional areas under rice-maize sequence. This technique aids in overcoming planting difficulties in rice fallow, reduce weed competition and improves fertilizer and water use efficiency and reduces the capital investment in machinery for land preparations and intercultural operations and improve maize yields (DMR Technical Bulletin, 2009). In Guntur district of Andhra Pradesh, due to late release of water in canals, timely sowing of subsequent black gram as a relay crop is getting delayed. In addition to this severe YMV problem in black gram also forced the farmers to switch over to non-traditional crop like maize in rice-fallows as an alternative to black gram. The farmers of Guntur district have evolved zero-till maize technology during 2000's to address the problems related to paddy-pulse cropping system. This technology was developed by the farmers of Guntur district themselves due to non-profitability of paddy-pulse crop sequence. Due to concentration of all efforts, on enhancement of productivity of maize, cost of cultivation of maize has drastically increased and leads to less net profit for the farmers. In addition to that, soil health has deteorated due to over usage of fertilizers and pesticides. The existing situation has prevailed due to lack of knowledge about the negative effects of over usage of fertilizers and pesticides. With this back drop the study was designed to know the knowledge level of no-till maize farmers.

MATERIAL AND METHODS

The study was carried out in Guntur district of Andhra Pradesh. Ex-post-facto research design was followed for the study. Guntur district was purposively selected because of its largest area and production under maize crop in all the districts of Andhra Pradesh. Out of fifty seven mandals in district, three mandals are selected purposively because of highest acreage of maize crop in the district. From each of the selected mandal, four villages were selected based on random sampling, the respondents were selected based on

proportionate random sampling thus constituting a sample size of 120 respondents. The data was collected with a well structured interview schedule and obtained data was coded, classified, and tabulated. Finally statistical tools such as mean, standard deviation, frequency and percentage, were used.

RESULTS AND DISCUSSION

For studying the knowledge level of farmers about no-till maize technologies, mean and standard deviation were used and the respondents respondents were classified as low, medium and high categories. The distribution of respondents according to their knowledge level on the recommended no-till maize cultivation practices is presented in Table 1.

The data in Table 1 revealed that majority (59.17%) of the no-till maize farmers had medium level of knowledge, followed by the rest with high (25.83%) and low (15.00%) level of knowledge. It is quite interesting to observe from the results that overall knowledge of no-till maize farmers was medium to high. This might be due to that majority of the no-till maize farmers were middle and old aged, high school to middle school education, with 4-6 years of farming experience in no-till maize cultivation, medium level of innovativeness, scientific orientation, risk orientation, economic orientation, mass media exposure and extension contact. The other reason for this trend could be due to their involvement and interest in acquiring the needed technical matter for cultivating the no-till maize.

Content Analysis of Level of Knowledge on Selected Production Technology of no-till maize farmers

To give more insight in to the knowledge of the respondents with respect to no-till maize cultivation, an item wise knowledge level analysis was carried out and the results were furnished in the Table 2.

Results furnished in the table 2 revealed that 75 to 100 per cent of the farmers had knowledge about selected production technology of no-till maize in the percentage rank order of their decreasing importance are; recommended seed rate for no-till maize crop (91.66%), popular sowing method for no-till maize (90.00%), recommended spacing for no-till maize crop (89.17%), recommended fungicide for seed treatment of no-till maize (87.50%), optimum depth of sowing for no-till maize (85.00%), recommended quantity of fungicide for treating 1 kg of maize seed (78.33%) and pre-emergence herbicide used for weed control in no-till maize (76.67%).

A glance at the table 2 revealed that knowledge was high with respect to simple agronomical practices like seed rate, dibbling, seed treatment and depth of sowing which do not involve much technical expertise.

It was also revealed that 50 to 75 per cent of the farmers had knowledge about selected production technology of no-till maize in the percentage rank order of their decreasing importance are; recommended dose of Carbofuran 3G granules for the control of stem borer (73.33%), recommended combination of herbicides recommended for control of weeds in no-till maize (71.67%), sprouting of rice stubbles can be controlled by spraying post-emergence herbicide (70.00%), recommended quantity of Nitrogen for no-till maize (69.17%), recommended days for sun drying of maize cobs before shelling (67.50%), recommended quantity of Potassium for no-till maize (65.00%), important insect that occur on no-till maize (64.17), recommended quantity of Phosphorus for no-till maize (62.50%), total crop period for long duration varieties (60.84%), sucking pests responsible for low yields in no-till maize (59.17%), recommended post-emergence herbicide for control of broad leaved weeds and nut sedge in no-till maize (57.50%), recommended chemical for management of stem borer (56.67%), schedule of irrigation for cultivation of no-till maize under black soils (55.83%), recommended quantity of Paraquat required to control weeds (55.00%), most critical stage for moisture stress in no-till maize (54.16%), top dressing in no-till maize (53.33%), turcicum leaf blight control (52.50%) and recommended dose of NPK as basal application in no-till maize (50.83%).

An over view of the table 2 implies that majority of the no-till maize farmers had medium knowledge with respect to weed management, nutrient management and pest management aspects which involves technical skills and expertise and require comprehensive knowledge on the operational aspects.

It is also revealed that 25 to 50 per cent of the farmers had knowledge about selected

Table 1. Distribution of no-till maize farmers according to their level of knowledge (n=120)

S.No.	Category	No-till maize farmers	
		Frequency	Percentage
1.	Low (< 20.57)	18	15.00
2.	Medium (20.58 to 27.09)	71	59.17
3.	High (> 27.09)	31	25.83
	Total	120	100.00
	Mean = 23.83		SD = 3.31

production technology of no-till maize in the percentage rank order of their decreasing importance are; Nitrogen fertilizer is applied at an interval of every 20 days (45.83%), chemical used for control of Sheath blight (41.67%), quantity of $ZnSo_4$/acre required to control Zn deficiency (40.83%), recommended method of fertilizer application for no-till maize cultivation (38.33%), recommended bio-fertilizers in no-till maize (36.67%), cutoff date for sowing of no-till maize (35.83%), suitable time for inter-cultivation (31.67%), recommended hybrids suitable for your area (30.83%), time of soil application of Urea solution (28.33%), recommended sweet corn varieties (25.00%)

From the table 2 it is clear that less per cent of the no-till maize farmers about bio-fertilizers, methods of application of fertilizers and names of the recommended hybrids. The possible reason for this may be lack of exposure on new technologies like bio-fertilizers.

It is also, further revealed that less than 25 per cent of the farmers had knowledge about selected production technology of no-till maize in the percentage rank order of their decreasing importance are; purple leaf in maize (21.17%), baby corn varieties (18.33%) and recommended dose of Azotobacter, Azospirillum and PSB (12.50%).

The table 2 shows that very less per cent of the farmers were having knowledge about nutrient deficiency symptoms, dosage of bio-fertilizers. It might be due to lack of interest of the respondents towards bio-fertilizers as they not showing immediate results.

The results regarding the level of knowledge of farmers on selected production technology of no-till maize reveals the importance of organization of seasonal long training programmes, demonstrations, exposure visits, farmer-scientist interactions for further enhancement of knowledge of the respondents on good agricultural practices related to no-till maize cultivation. So the Department of Agriculture, Krishi Vigyan Kendras (KVK), District Agricultural Advisory Transfer of Technology Centre (DAATTC) should organize the above extension activities for enhancement of knowledge of the farmers and thereby increasing the adoption rate of recommended no-till maize production technologies.

CONCLUSION

Knowledge level of the farmers about no-till maize technologies was found to be medium. Knowledge of most of the farmers was high in the practices like sowing practices, weed management, nutrient management and pest management. Less per cent of the no-till maize farmers were having knowledge about bio-fertilizers, methods of application of fertilizers, names of the recommended hybrids, nutrient deficiency symptoms and dosage of bio-fertilizers. The possible reason for this may be lack of exposure on new technologies like bio-fertilizers. lack of interest of the respondents towards bio-fertilizers as they not showing immediate results. The results regarding the level of knowledge of farmers on selected production technology of no-till maize reveals the importance of organization of seasonal long training programmes, demonstrations, exposure visits, farmer-scientist interactions for further enhancement of knowledge of the respondents on good agricultural practices related to no-till maize

Table 2. Content analysis of level of knowledge on selected production technology of no-till maize farmers. **(n=120)**

S.No	Particulars	Knowledge				Rank
		Correct		Incorrect		
		F	%	F	%	
1.	Cutoff date for sowing of no-till maize (2nd week of January)	43	35.83	77	64.17	31
2.	Recommended seed rate for no-till maize crop (8 kg/ acre)	110	91.66	10	8.33	1
3.	Recommended spacing for no-till maize crop (60 x 20 cm)	107	89.17	13	10.83	3
4.	Optimum depth of sowing for no-till maize (4 -5 cm)	102	85.00	18	15.00	5
5.	Recommended fungicide for seed treatment of no-till maize (Captan or Thiram or Mancozeb)	105	87.50	15	12.50	4
6.	Recommended quantity of fungicide for treating 1 kg of maize seed (2.5-3 gms)	94	78.33	26	21.67	6
7.	Schedule of irrigation for cultivation of no-till maize under black soils (once in 20 days)	67	55.83	53	44.17	20
8.	Pre-emergence herbicide used for weed control in no-till maize (Atrazine)	92	76.67	28	23.33	7
9.	Recommended quantity of Paraquat required to control weeds (1 lit/acre)	66	55.00	54	44.00	21
10.	Recommended dose of Azotobacter, Azospirillum and PSB per acre (1 kg)	15	12.50	99	87.50	38
11.	Recommended quantity of Nitrogen for no-till maize (100 kg/acre)	83	69.16	37	30.83	11
12.	Recommended quantity of Phosphorus for no-till maize (32 kg/acre)	75	62.50	35	37.50	15
13.	Recommended quantity of Potassium for no-till maize (32 kg/acre)	78	65.00	42	35.00	13
14.	Recommended combination of herbicides for control of weeds in no-till maize (Atrazine 1	86	71.67	34	28.33	9
15.	kg + Paraquat 1 lit) / acre	49	40.83	71	59.17	28
	Quantity of $ZnSo_4$ required to control Zn deficiency (400 gms/acre)					
16.	Recommended dose of Carbofuran 3G granules for the control of stem borer (6 kg/	88	73.33	32	26.67	8
17.	acre)	50	41.67	70	58.33	27
	Chemical used for control of Sheath blight (Propiconazole)					
18.	Recommended days for sun drying of maize cobs before shelling (3-4 days)	81	67.50	39	32.50	12
19.	Recommended hybrids suitable for your area (Pioneer 30V92, Godrej 105)	37	30.83	83	69.17	33

Table 2 cont....

S.No.	Particulars	Knowledge				Rank
		Correct		Incorrect		
		F	%	F	%	
20.	Recommended sweet corn varieties (Sugar75, Priya)	30	25.00	90	75.00	35
21.	Mention two baby corn varieties (G5414, Gold 999)	22	18.33	97	81.67	37
22.	Time of soil application of Urea solution (15 DAS)	34	28.33	86	71.67	34
23.	Most critical stage for moisture stress in no-till maize (Pre-flowering)	65	54.16	55	45.83	22
24.	Suitable time for inter-cultivation (30 DAS)	38	31.67	82	68.33	32
25.	Important insect that occur on no-till maize (pink stem borer)	77	64.17	43	35.83	14
26.	Turcicum leaf blight can be controlled by spraying with Mancozeb @ 2.5 g/lit	63	52.50	57	47.50	24
27.	Recommended dose of NPK as basal application in no-till maize per acre (33-32-16)	61	50.83	60	49.17	25
28.	Recommended dose of N and K as top dressing in no-till maize (33-16)	64	53.33	56	46.67	23
29.	Recommended bio-fertilizers in no-till maize (Azotobacter, Azospirillum and PSB)	44	36.67	76	63.33	30
30.	Sprouting of rice stubbles can be controlledby spraying post-emergence herbicide Paraquat @ 1 lit/acre	84	70.00	36	30.00	10
31.	Recommended chemical for management of stem borer (Monocrotophos 320 ml/acreor Chloratraniliprole 60 ml/acre)	68	56.67	52	43.33	19
32.	Popular sowing method for no-till maize (Dibbling)	108	90.00	12	10.00	2
33.	Important sucking pests responsible for low yields in no-till maize (Mites and Aphids)	71	59.17	49	40.83	17
34.	Recommended method of fertilizer application for no-till maize cultivation (Pocketing)	46	38.33	74	61.67	29
35.	2,4 –D Sodium salt can be used for the control of broad leaved weeds and nut sedge in no-till maize	69	57.50	51	42.50	18
36.	Purple leaf in maize is caused due to the deficiency of Phosphorus	26	21.17	94	78.33	36
37.	Nitrogen fertilizer is applied at an interval of every 20 days	55	45.83	65	54.17	26
38.	Total crop period for long duration varieties is 100-120 days	73	60.84	47	39.16	16

cultivation. So the training institutions, NGOs and extension functionaries, Department of Agriculture, Krishi Vigyan Kendras (KVK), District Agricultural Advisory Transfer of Technology Centres (DAATTC) who are in constant contact with farming community need to take into account the profile characteristics while planning and executing the agricultural development programmes as these characteristics were found to influence their knowledge about no-till maize production technologies.

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