

KNOWLEDGE LEVEL AND EXTENT OF ADOPTION OF NATURAL FARMING AMONG GROUNDNUT GROWERS IN JUNAGADH DISTRICT OF GUJARAT

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Abstract

The present study was carried out in Maliya, Keshod, Mangrol and Mendarda, talukas of Junagadh district, which were selected purposively. Total 120 NF groundnut growers were selected for the study. The primary data were collected through personal interviews with the help of a structured survey schedule. The secondary data were collected from the FPOs brochures, websites, government reports and other related institutions etc. Knowledge level of all the NF groundnut growers (100%) reported that they were very well aware of humus, jeevamrit, seed treatment, khatichhas, weed control and earthworm used in natural farming. Majority of growers had applied mixed cow products. All the (100%) NF groundnut growers used cultural as well as physical method to control the pest and disease. The major constraints faced by groundnut growers in natural farming was the lack of an established market for natural farming products.

Keywords: Groundnut, Knowledge level, Adoption level, Natural farming, Constraints

Introduction

India is one of the top three producing countries of groundnut in the world. It ranks second next to China (34.00 per cent contribution to the world groundnut production). Nearly 19.00 per cent of world groundnut production is contributed by India during 2021. Nigeria ranks third in world groundnut production with a 09.00 per cent contribution. Gujarat ranks 1st in the area of 2162.90 ha with a production of 4133.60 tonnes and yield of 1911.20 kg/ha groundnut in the country. The area under groundnut constitutes approximately 03.30 per cent of the net sown area in India. Planners are concerned about the diminishing area because groundnut is the main crop for edible oil seeds in India. (Gayathri 2018).

Natural Farming (NF) is a one-of-a-kind chemical-free farming approach that is regarded as an agro ecological approach. The core of Natural Farming practices is the application of *Jeevamritha* and *Beejamritha*. *Jeevamritha* is a liquid fermented concoction of cow dung, cow urine, jaggery, pulses flour, and bund soil mixed with water, which contains a large number of beneficial microbes that act as a bio-stimulant promoting the activity of soil microorganisms as well as phyllospheric microorganisms when applied to the field/foilage. *Beejamritha* is also *Jeevamritha* without water that is used for seed treatment. Beneficial microbes are expected to colonize the roots and leaves of germinating seeds, assisting in the healthy growth of the plants (Kumar *et al.*, 2023). The Government of India is promoting natural farming through Bharatiya Prakritik Krishi Paddhati (BPKP) introduced during 2020-21 as a sub-scheme of Paramparagat Krishi Vikas Yojana (PKVY) for the promotion of traditional indigenous practices including natural farming. BPKP aims at promoting traditional indigenous practices, which are largely based on farm biomass recycling with an emphasis on mulching and the use of cow dung and urine formulations.

In Gujarat, total area under natural farming was reported 1,17,518 ha and total 1,22,673 farmers adopted natural farming and 84 FPOs linked with natural farming as per year 2021. In Gujarat, Dang district was announced as a 100 per cent natural farming district where the area under cultivation was reported 58000 ha, with 12000 farmers and a total of 3 FPOs linked with the natural farming in this district. The present study was undertaken to understand the knowledge level, extent of adoption and identification of constraints faced by groundnut growers in natural farming.

Methodology

A multi stage sampling method was adopted as an appropriate sampling procedure for the study. In the first stage, Junagadh district was selected purposively for the study because of a large number of areas sown under groundnut crop. In the second stage, four talukas from Junagadh district (Maliya, Keshod, Mangrol and Mendarda) were selected purposively. In the third stage, from each taluka five villages were selected randomly and from each village six growers were selected randomly. In this way a total of 120 growers were selected from the Junagadh district. To study of the knowledge level and extent of adoption of crop management by the growers, simple tabular analysis method was used. Similar method used by Patel *et al.* 2017 and Ranjit Kumar *et al.* 2019. To identify constraints faced by groundnut growers garrett's ranking method was used. Similar method used by Jalu 2022 and Midame A. and Pyasi V. K. 2020. As per this method, respondents were asked to assign the rank for all factors.

Results and Discussion

Knowledge level of groundnut growers regarding natural farming

The results indicated as per above Table 1 that the all-natural farming groundnut grower's have knowledge regarding humus, *jeevamrit*, seed treatment, *khatichhas*, weed control and earthworm use in natural farming.

Table 1: Distribution of NF groundnut growers according to their knowledge level (n=120)

Sr. No.	Particular	Frequency	Percentage
		Responded in Yes	
1	Do you know about humus	120	100.00
2	Do you know about <i>beejamrit</i>	116	96.67
3	Do you know the methods of making <i>beejamrit</i>	108	90.00
4	Do you know about <i>jeevamrit</i>	120	100.00
5	Do you know the methods of making <i>jeevamrit</i>	112	93.33
6	Do you know about <i>ghanjeevamrit</i>	95	79.17
7	Do you know about methods of making <i>ghanjeevamrit</i>	55	45.83

8	Do you know about weed control in natural farming	120	100.00
9	Do you know about seed treatment	120	100.00
10	Do you know about <i>neemastra</i>	84	70.00
11	Do you know about <i>bhramastra</i>	36	30.00
12	Do you know about <i>agniastra</i>	27	22.50
13	Do you use <i>khatichhas</i>	120	100.00
14	Do you know about <i>dashparni ark</i>	62	51.67
15	Do you know about disease and pest management in natural farming	106	88.33
16	Do you know about earthworm and its useful in natural farming	120	100.00

Other parameters included knowledge about the *beejamrit* (96.67%), growers knew the methods of making *jeevamrit* (93.33%), growers knew about method making of *beejamrit* (90.00%), growers knew about disease and pest management in natural farming (88.33%),

growers knew about *ghanjeevamrit* (79.17%), growers knew about *neemastra* (70.00%), growers knew about *dashparniark* (51.67%), growers knew about methods of making *ghanjeevamrit* (45.83%), growers knew about *bhramastra* (30.00%), and growers knew about *agniastra* (22.50%).

Table 2: Distribution of growers according to their knowledge level about quantity of *jeevamrit* in NF (n=120)

Sr. No.	Quantity of <i>jeevamrit</i> applying by growers in natural farming (litre)	Frequency	Percentage
1	0-400	40	33.33
2	401-450	58	48.34
3	451-500	22	18.33
Total:		120	100.00

Most of the growers (48.34%) applied *jeevamrit* 401-450 litre/ha, (33.33%) growers applied 0-400 litre/ha and only (18.33%) growers

applied 451-500 litre/ha *jeevamrit*. This showed that all the (100.00%) growers applied *jeevamrit* with irrigation water.

Table 3: Distribution of growers according to their knowledge level about application time of *jeevamrit* in NF (n=120)

Sr. No.	Time of <i>jeevamrit</i> application	Frequency	Percentage
1	Apply with irrigation	120	100.00
2	Not applying	00	00.00
3	Any other	00	00.00
Total:		120	100.00

Most of growers 92.50 per cent did not applying *ghanjeevamrit*, (04.17%) growers applied 1501-2000 kg/ha and only (03.33%) growers applied 1000-1500 kg/ha *ghanjeevamrit*.

Table 4: Distribution of growers according to their knowledge level about quantity of *ghanjeevamrit* in NF (n=120)

Sr. No.	<i>Ghanjeevamrit</i> quantity (kg)	Frequency	Percentage
1	0-0	111	92.50
2	1000-1500	04	03.33
3	1501-2000	05	04.17
Total:		120	100.00

Only 07.50 per cent growers applied *ghanjeevamrit* before sowing and majority of (92.50%) growers were not applying *ghanjeevamrit* in their field as preparing *ghanjeevamrit* is more cumbersome job and difficult to store as well.

Table 5: Distribution of growers according to their knowledge about application time of *ghanjeevamrit* in NF (n=120)

Sr. No.	Time of <i>ghanjeevamrit</i> application	Frequency	Percentage
1	Before sowing	09	07.50
2	After sowing	00	00.00
3	Not applying	111	92.50
Total:		120	100.00

All the 100.00 per cent growers preferred to use cultural methods and followed by physical method (96.67%), mechanical method (63.33%) and biological method (55.83%) to control disease and pest management in natural farming.

Table 6: Distribution of growers according to their knowledge level regarding various plant protection measures (n=120)

Sr. No.	Various plant protection measures	Frequency	Percentage
1	Physical method	116	96.67
2	Mechanical method	76	63.33

3	Cultural method	120	100.00
4	Biological method	67	55.83

All the growers use *khaticahas* and cow urine for the control of pest and disease management in natural farming followed by 65.83 per cent of growers applied mixed cow product, 53.33 per cent of growers used herbal plants and 37.50 per cent growers used neem oil for pest and disease management in natural farming.

Table 7: Distribution of growers according to their knowledge regarding indigenous techniques used to control disease and pest (n=120)

Sr. No.	Indigenous technique	Frequency	Percentage
1	<i>Khaticahas</i>	120	100.00
2	Cow urine	120	100.00
3	Neem oil	45	37.50
4	Herbal plant (<i>neemastra</i> , <i>bhrahmastra</i> etc.)	64	53.33
5	Mixed of cow product	79	65.83

All of the (100%) growers were not applied any type of residue mulching in groundnut crops during the natural farming practices.

Table 8: Distribution of growers according to their knowledge on types of residues used in mulching (n=120)

Sr. No.	Types of residues used in mulching	Frequency	Percentage
1	Not using	120	100.00
2	Crop residue	00	00.00
3	Plastic Film	00	00.00
Total:		120	100.00

1) Adoption of natural farming by the groundnut growers

As shown in Table 9 it can be inferred that in crop management, inter cropping was partially adopted by 45.00 per cent growers and fully adopted by 08.33 per cent growers. Mixed cropping was partially adopted by 02.50 per cent growers and never adopted by 97.50 per cent growers.

Table 9: Distribution of growers according to their adoption level of various crop management practices (n=120)

Sr. No.	Crop management	Frequency			Percentage		
		Partially	Fully	Never	Partially	Fully	Never
1	Inter cropping	54	10	56	45.00	08.33	46.67
2	Mixed cropping	03	00	117	02.50	00.00	97.50
3	Crop rotations	44	74	02	36.67	61.67	01.67
4	Weed management without chemical	00	120	00	00.00	100.00	00.00
5	Water management	41	79	00	34.17	65.83	00.00
6	Mulching	00	00	120	00.00	00.00	100.00

Crop rotation was fully adopted by 61.67 per cent growers and partially adopted by 36.67 per cent growers. Weed management without chemical was fully adopted by all the (100.00%) growers. whereas mulching was never adopted by (100.00%) all the growers.

Table 10: Distribution of growers according to various adoption of nutrient management practices (n=120)

Sr. No.	Nutrient management practices	Frequency			Percentage		
		Partially	Fully	Never	Partially	Fully	Never
1	Use of <i>jeevamrit</i>	31	89	00	25.83	74.17	00.00
2	Use of <i>ghanjeevamrut</i>	07	00	113	05.83	00.00	94.17
3	Use of <i>gaumutra</i>	00	120	00	00.00	100	00.00
4	Water management	34	86	00	28.33	71.67	00.00
5	Use of natural minerals	27	93	00	22.50	77.50	00.00
6	<i>Gaukrupaamrit</i>	19	00	101	15.83	00.00	100.00

Table 10 exhibited that in nutrient management, use of *jeevamrit* was partially adopted by 25.83 per cent growers and fully adopted by 74.17 per cent growers. Use of *ghanjeevamrut* was partially adopted by 05.83 per cent growers and never adopted by 94.17 per cent growers. Use of *gaumutra* was fully adopted by 100.00 per cent growers. Water management was partially adopted by 28.33 per cent and fully adopted by 71.67 per cent growers. Use of natural minerals was partially adopted by 22.50 per cent and fully adopted by 77.50 per cent growers. In other method *gaukrupaamrit* was partially adopted by 15.83 per cent and never adopted by 84.17 per cent growers.

Table 11: Distribution of growers according to various adoption level of pest and disease management (n=120)

Sr. No.	Pest/disease management practices	Frequency			Percentage		
		Partially	Fully	Never	Partially	Fully	Never

1	Seed treatment	65	51	04	54.17	42.50	03.33
2	Use of herbal plants for control of pests	28	69	23	23.33	57.50	19.17
3	Use of cow urine	00	120	00	00.00	100.00	00.00
4	Use of <i>neemastra</i>	53	28	39	44.17	23.33	32.50
5	Use of <i>brahmastra</i>	27	04	89	22.50	03.33	74.17
6	Use of <i>dashaparni ark</i>	39	29	52	32.50	24.17	43.33
7	Use of <i>khatichhas</i>	00	120	00	00.00	100.00	00.00
8	Preparing live hedge	73	41	06	60.83	34.17	05.00
9	Sowing trap crop	54	25	41	45.00	20.83	34.17
10	Hand picking of insects	32	21	67	26.67	17.50	55.83

Table 11 presents the various pest and disease management practices use of seed treatment was partially adopted by 54.17 per cent growers and fully adopted by 42.50 per cent growers. Use of herbal plants for control of pests was partially adopted by 23.33 per cent growers and fully adopted by 57.50 per cent growers. Use of cow urine was fully adopted by all 100.00 per cent growers. Use of *neemastra* was partially adopted by 44.17 per cent and fully adopted by 23.33 per cent growers. Use of *brahmastra* was partially adopted by 22.50 per cent and never adopted by 74.17 per cent growers. Use of *dashaparni ark* was partially adopted by 32.50 per cent and fully adopted by 24.17 per cent growers. Use of *khatichhas* was fully adopted by all 100 per cent growers. Preparing live hedge was partially adopted by 60.83 per cent and fully adopted by 34.17 per cent growers. Sowing trap crop was partially

adopted by 45.00 per cent and fully adopted by 20.83 per cent growers. Hand picking of insects was partially adopted by 26.67 per cent and fully adopted by 17.50 per cent growers.

Constraints faced by groundnut growers in adoption of natural farming

It could be noted from above Table 12 that lack of an established market for natural farming products was considered most important constraint followed by inadequate marketing facilities for natural farming crop production, low yield realization, lack of training and technical guidance, lack of awareness regarding natural farming practices, limited support from government, labour intensive, problems related to making natural input and growers perception was chemical fertilizers are more effective than natural products.

Table 12: Distribution of groundnut growers as per (n=120)

Sr. No.	Various constraints faced by growers	Garrett's score	Rank
1	Lack of established market for NF product	74.41	I
2	Inadequate marketing facilities	69.63	II
3	Low yield realization	59.44	III
4	Lack of training/technical guidance	56.98	IV
5	Lack of awareness regarding NF practices	50.98	V
6	Limited support from Government	41.70	VI
7	Labour intensive	37.81	VII
8	Problems related to making natural input	30.31	VIII
9	Farmer perception that chemical fertilizer is more effective than natural products	24.75	IX

Conclusion

Knowledge level of all the NF groundnut growers reported that they were very well aware of humus, *jeevamrit*, seed treatment, *khatichhas*, weed control and earthworm used in natural farming. Result found that all of the NF groundnut growers had used cultural method. All the growers used *Khatichhas*, Cow urine for the control of pests and diseases in natural farming. In crop management, weed management was fully adopted by all the NF groundnut growers. In nutrient management practices, all the growers use of *gaumutra* and *jeevamrit* were also fully adopted by most of the growers. Use of cow urine and *khatichhas* was fully adopted by all the NF groundnut growers and use of herbal plants (*neemastra*, *brahmastra* etc.) for controlling the pest and diseases was also fully adopted by growers. The major constraints faced by groundnut growers in natural farming were the lack of an established market for natural farming products followed by inadequate marketing facilities and low yield realization.

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