

## ADOPTION LEVEL OF MODERN SORGHUM PRODUCTION TECHNOLOGY IN HARYANA

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### SUMMARY

In India sorghum is the fifth most important cereal crop after wheat, rice, maize and barley. It is mainly grown in the region of Peninsular and Central India. Maharashtra is leading state in sorghum production followed by Karnataka while Andhra Pradesh, Madhya Pradesh, Gujarat, Rajasthan, Uttar Pradesh, Tamil Nadu and other states grow sorghum in small areas mainly for fodder. In Haryana, sorghum is grown as fodder crop and area of sorghum in Haryana is 40.3 thousand hectare, and total production of sorghum is 21.3 thousand tones with average yield of 528 kg per hectare (DOA, Haryana). The objective of the study was to find out the adoption level of modern sorghum production technology in Haryana on various parameters. In Gurugram district, two blocks were selected and out of these two blocks, eight villages were selected randomly for the study (Four villages from each block). 120 sorghum growers were selected from these eight villages and interviewed with the help of a well structured interview schedule on different independent and dependent variables. The collected data was analyzed with various statistical tools. The results of the study revealed that in case of recommended cultivars majority of respondents belong to full adoption category. Majority of respondents had partial level of adoption in recommended seed rate, time of planting, manure and fertilizers, intercultural operations, irrigation and disease and their control. To overcome the partial adoption, there are some strategies we should follow, like need to highlight the sorghum production to bridge the gap in demand and availability of fodder in the area. Regular trainings of sorghum growers should be organized related to fodder and animal sciences. Agriculture Officers must be given trainings through various refresher courses on sorghum and other fodder production technologies.

**Key words :** Adoption, schedule, forage sorghum, intercultural, cultivar

Sorghum is related to the grass family Poaceae. It is also known as *Jowar*, *Chari* and *durra*, in many parts of India. Centre of origin of sorghum [*Sorghum bicolor* (L.) Moench] is generally believed to be around the present day Ethiopia in Africa. Sorghum has come from Africa to India during the first millennium in India. Sorghum is the fifth most important cereal crop after wheat, rice, maize and barley. It is mainly grown in the region of Peninsular and Central India. Maharashtra is leading state in sorghum production followed by Karnataka while Andhra Pradesh, Madhya Pradesh, Gujarat, Rajasthan, Uttar Pradesh and Tamil Nadu, are the other states which grow sorghum in small areas mainly as fodder crop. In Haryana, sorghum is grown as fodder crop mainly. Total area of sorghum in Haryana is 40.3 thousand hectare, and total production of sorghum is 21.3 thousand tons with average yield of 528 kg/ha. India has 16 per cent of the total livestock population of the world with respect to only 2.6 per cent of the

world's geographical area. Though, India accounts for high cattle population, the productivity of cattle is the lowest mainly due to unavailability of good quality fodder in sufficient quantity. India has 512.05 million livestock population but the area under fodder crops remained static about 4.4 % of the total cultivated area mainly due to focus on the cereal, horticultural crops and cash crops after green revolution. Till now, more than 100 varieties of sorghum crop have been developed; further suitable multi-cut varieties for lean periods with good quality fodder should be developed. Keeping in view the aforementioned facts, the study was proposed to be undertaken with the specific objective to study the farmers' adoption level in sorghum production technology.

The study was conducted in Gurugram district of Haryana. Out of twenty two districts of Haryana state, Gurugram was selected purposively. There is a huge demand of fodder crops from dairy point of view and sorghum has emerged as an important fodder crop

among the entire fodder crops. Keeping in view that, the study was undertaken in Gurugram district. Sorghum fodder is one alternative to feed the milch animals. It was necessary to assess the knowledge and adoption level of the sorghum growers or dairy farmers for scientific cultivation of sorghum fodder in Gurugram to enhance the production of sorghum fodder.

### Selection of respondents

After selection of district, next step was to locate the block under the study. There are four blocks (Farrukhnagar, Gurugram, Pataudi, Sohna) in Gurugram district; two blocks (Farrukhnagar, Pataudi) were selected randomly. After selection of blocks, four villages from each block were selected randomly. Allimuddinpur, Mushaidpur, Kaliyawas, and Dabooda selected from Farrukhnagar block and Unchamajra, Mirzapur, Baspadmaka, Narhera from Pataudi block. Fifteen farmers from eight villages were randomly selected. Thus, a total number of 120 farmers were selected as a sample for present study. Thus, a list of sorghum growers was prepared with the help of Agriculture Development Officer (ADO), head of the panchayats (Sarpanch) and key persons of these villages.

### Collection and analysis of data

A well-structured interview schedule was developed with regard to the selected dependent and independent variables for the present study. The most important tool is personal interview schedule. Therefore, the data were collected through personal interview schedule. Adoption was the dependent variable for this investigation to find out the adoption level among the farmers about the recommended production technologies of sorghum. 3, 2, 1 scores were given on full, partial and non adoption, respectively on adoption of sorghum production technologies. The level of adoption was calculated with the help of statistical tools like total score, mean score, and percentages.

The recommended cultivars which were SSG 59-3, HC 136, HC 171, HJ 513, HJ 541 and the analyzed data revealed that adoption level found 71.3 per cent for recommended cultivars of sorghum among the respondents and ranked III. Weighed mean score of the adoption level of recommended cultivars was 2.14. Regarding seed rate, adoption level was found 68.0 per cent among the respondents and assigned V rank with 2.04 weighted mean score. The seed rate of forage sorghum according to the recommended package of practices 50-60 kg /hectare and for SSG

TABLE 1  
Adoption level about the recommended package of practices for sorghum production technology

S. No.	Practices	Adoption level			Total score	Weighted mean score	Percentage	Rank order
		Full (3)	Partial (2)	Nil (1)				
1.	<b>Recommended cultivars :</b> SSG 59-3, HC 136, HC 171, HC 308, HJ 513, HJ 541	54 (45.0)	29 (24.2)	37 (30.8)	257	2.14	71.3	III
2.	Seed rate: 50-60 kg/ hectare	34 (28.3)	57 (47.5)	29 (24.2)	245	2.04	68	V
	<b>A. Time of planting :</b>							
	i. Summer crop (From 20 March to 10 April) ii. Kharif (From 25 June to 10 July)	53 (44.2)	57 (47.5)	10 (8.3)	283	2.35	78.3	I
	<b>B. Planting distance: Row to Row: 25cm</b>	1 (0.8)	48 (40.0)	71 (59.2)	170	1.41	47	VIII
3.	<b>Manure and fertilizer :</b> Organic manure used FYM, compost, ash etc.	34 (28.3)	71 (59.2)	15 (12.5)	259	2.15	71.6	II
4.	<b>Intercultural operations: Weeding</b>	40 (33.3)	58 (48.3)	22 (18.3)	258	2.15	71.6	II
5.	<b>Irrigation: No. of irrigations in different seasons</b> Summer (March-June) : 5 Kharif: 1-2 (Depending upon rainfall)	32 (26.7)	66 (55.0)	22 (18.3)	250	2.08	69.3	IV
6.	<b>Insects-pests and their control :</b> Shoot fly : - Early sowing (During mid May to June) Stem borer: 400 g Carbaryl 50% SP in 200 L water 20 DAS, Grass hopper: - 500 ml Malathion 50 EC or 750 g Carbaryl 50 WP in 250 L Water.	5 (4.2)	50 (41.7)	65 (54.2)	180	1.5	50	VII
7.	<b>Diseases and their control :</b> Grain smut diseases <b>Control :</b> Seed treatment with 2 g Emisan per kg of seed	15 (12.5)	58 (48.3)	47 (39.2)	208	1.73	57.6	VI

59-3 was 30-35 kg/hectare. In case of time of planting, highest adoption level was found *i.e.* 78.3 per cent. It ordered 1st rank with highest weighted mean score 2.35. Regarding planting distance *i.e.* row to row 25 cm, lowest adoption level was 47.0 per cent among the respondents with 1.41 weighted mean score and VIII rank order. The adoption level about the manures and fertilizers among the respondents found 71.6 per cent with weighted mean score of 2.15 and II rank order. In case of intercropping operation, weeding was the main intercropping operation for removing the unwanted plants from the fields. Adoption level 71.6 per cent found among the respondents about the intercropping operation with 2.15 weighted mean score and II rank order. In case of irrigation, five irrigations were recommended in package of practices for summer season and 1-2 irrigation for *kharif* season crop. Adoption level of 69.3 per cent was found among the respondents with 2.08 weighed mean score and IV rank order. With regard to insects –pest and their control, adoption level was found 50.0 per cent with 1.5 weighted mean score and VII rank order. Most common insects-pests were shoot fly, stem borer and grasshopper and these insects-pests were controlled by early sowing and using pesticides *viz.* carbaryl and malathion. In sorghum most common disease was grain smut. Adoption level of control of grain smut was 57.6 per cent among the respondents with 1.73 weighted mean score and VI rank order. Grain smut controlled by seed treatment with 2g emisan per kg of seed.

Study shows that recommended cultivars which were SSG 59-3, HC 136, HC 171, HJ 513, HJ 541, that adoption level was found 71.3 per cent of recommended cultivars of sorghum among the respondents as these cultivars are most suitable for plain area. Regarding seed rate, adoption level was found 68.0 per cent among the respondents because of seed was cheaply available. For SSG 59-3 seed rate was 30-35 kg/hectare. Highest adoption level was found in the time of planting *i.e.* 78.3 per cent with highest weighted mean score 2.35. It was found because of non-availability of green fodder at that time. Regarding planting distance *i.e.* row to row 25 cm, lowest adoption level was 47.0 per cent among the respondents because most of the farmers using broadcasting method for sowing of sorghum. It was observed that the adoption level for manures and fertilizers among the respondents found 71.60 per cent. They know the ill effects of excessive use of chemical fertilizers and fertility of soil was in good condition. Recommendation of the fertilizers for single cut and multi-cut varieties were different. Recommendation of urea is 108.75kg/hectare and SSP

@ 100 kg /hectare according to package of practices. While in case of intercropping operation adoption level was found 71.6 per cent among the respondents because there was no serious problem of weeds in the study area. While in case of irrigation, adoption level 69.3 per cent was found among the respondents because of sufficient irrigation water was available in the study area. With regard to insects-pest and their control, adoption level was found 50.0 per cent, most common insects-pests were shoot fly, stem borer and grasshopper in the study area.

### CONCLUSION

The adoption level of modern sorghum technology in Haryana, the highest level of adoption *i.e.* 78.30 per cent was found for time of planting and lowest level of adoption was found for planting distance *i.e.* 47 per cent. For full adoption of sorghum production technologies *viz.* adoption of multi-cut varieties, recommended doses of manure and fertilizer, number of irrigations, integrated pest and disease management practices etc., regular organizing the trainings regarding fodder production were very useful. To enhance the adoption rate, there are some strategies we should follow like need to highlight the sorghum production to bridge the gap in demand and availability of fodder in the area. Regular farmer trainings and farmer-scientist interaction meets should be organized related to fodder production and livestock management. Agriculture Development Officers must be given trainings regarding fodder production technology and seed production technology of sorghum crop.

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