

Adoption of drip irrigation in potato crop by the farmers of Banaskantha District

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Received: 02 March, 2019

Accepted: 26 August, 2019

ABSTRACT

The present study was conducted purposively in Banaskantha district, because of more area under Potato and more adoption of MIS as compared to other districts of North Gujarat Agro Climatic Zone. Among, 14 talukas of Banaskantha district 3 talukas i.e. Deesa, Vadgam and Palanpur having more area under Potato cultivation were selected, Five villages from each selected talukas were selected randomly. From each selected village, 8 farmers were selected randomly making a sample of 120 respondents. Majority of farmers had knowledge about the practices viz., seed treatment for control of the pest and diseases (96.66 %), sowing distance (91.66 %) and selection of variety for table purpose (90.00 %). Majority of farmers adopted the practices viz., installation of liquid fertilizer tank for drip system (91.66 %), use of filters to avoid clogging of the system (87.50 %) and cleaning of filters, nozzle etc. to remove impurities (70.66 %).

Potato has emerged as fourth most important food crop in India after rice, wheat and maize. Now, it becomes as an essential part of breakfast, lunch and dinner worldwide and grown by more than 100 countries. Nutritional point of view, potato is a wholesome food and deserves to be promoted as a potential high quality vegetable cum food crop in the country. Last year in 2016-17, due to the bumper crop of about 439 lakh tones in the country and lack of post harvest management, glut situations was raised in the market due to surplus yield which ultimately resulted in decline in the prices drastically. In 2016-17 in Gujarat, the potato acreage is estimated more about 1.24 lakh ha. against 1.10 lakh ha in 2015-16.

Among the total area Banaskantha (52000 ha) having highest potato cultivation next to sabarkantha 21,400 ha. In current year Banaskantha is having a highest cultivation i.e. 78000 ha. than other district.(source: DAO, Palanpur)

Drip irrigation has helped the arid region of Banaskantha to be on top in water saving campaign for the year 2010-11 in Gujarat. Banaskantha is followed by Sabarkantha and Junagadh districts, says the statistical report of Gujarat Green Revolution Company Ltd (GGRC), a government of Gujarat undertaking, which was issued on the eve of World Water Day. So the study "Adoption of drip irrigation in potato crop by the farmers of of Banaskantha District" will plan with following specific objectives.

Objectives of the study:

1. To measure the knowledge level of farmers about scientific potato cultivation
2. To study the adoption of drip irrigation technology in potato crop

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MATERIALS AND METHODS

The present study was conducted purposively in Banaskantha district because of maximum area under Potato and higher adoption of MIS as compared to other districts of North Gujarat Agro Climatic Zone. Among, 14 talukas of Banaskantha district 3 talukas i.e. Deesa, Vadgam and Palanpur having maximum area under Potato cultivation were selected, Five villages from each selected talukas were selected randomly. From each selected village, 8 potato farmers were selected randomly making a sample of 120 respondents.

The present study was confined to ex-post-facto research design. An interview schedule was developed according to the objectives of study and the data were collected by arranging personal interview with 120 respondents.

Table 1 Name of selected villages

Name selected of district	Name of selected Taluka	Name of selected villages	No. of villages	No. of Farmers
Banaskantha	Deesa	Vadlifarm, Thervada, Bayvada, Vithodar, Talepur	05	40
	Palanpur	Aligadh, vasda, Malan, Mervada, Ratanpur	05	40
	Vadgam	Ghodiya, Varnavada, Memdpur, Rampura(Dhota), pepal	05	40
Total			15	120

RESULT AND DISCUSSION

Knowledge level of Farmers About Scientific Potato Cultivation

Knowledge is the cognitive behavior of an individual. The knowledge of an innovation is pre-requisite for adoption. In the present study, it was operationalized as the totality of understood information regarding potato crop production technology. For measurement of knowledge an objective test was developed. List of practices were informed and farmers were asked whether they know each of the practice in form of "Yes" or

"No" with a score of "1" and "0" respectively. The data pertaining to these are presented in Table 2.

Table 2 Practice wise knowledge of farmers about scientific potato cultivation (n = 120)

Sr. No.	Practice wise knowledge	Number	Per cent
1.	Organic manure and quantity require while land preparation	105	87.50
2.	Sowing period for potato planting	102	85.00
Knowledge about varieties for different purpose			
3.	(i) Table purpose variety	108	90.00
2.	(ii) French fries variety	20	16.66
3.	(iii) Processing	30	25.00
4.	Seed rate for planting	85	70.83
5.	Sowing distance	110	91.66
6.	Chemical fertilizers with quantity	16	13.33
7.	Weedicide with recommended dose	41	34.16
8.	Seed treatment for control of the pest and diseases	116	96.66
9.	Chemical control of pest	23	19.16
10.	Chemical control of diseases	21	17.50
11.	Soluble chemical fertilizer application	78	65.00
12.	Discharge rate of dripper/hr	48	40.00
13.	Dripper distance on the lateral pipes	28	23.33
14.	Application of recommended fertilizers through ventury/fertilizer tank	29	24.16
15.	After care treatment of DIS	18	15.00
16.	Required pressure at mainline and sub mains near control valve	15	12.50
17.	Acid treatment and chlorination	32	26.66
18.	Post harvest technologies	68	56.66

The data presented in Table 2 indicate that great majority of farmers had knowledge about the practices viz., seed treatment for control of the pest and diseases (96.66 %), sowing distance (91.66 %) and variety selected for table

purpose (90.00 %). Less number of farmers had knowledge in practices like value added products from potato for commercial purpose (1.66 %), required pressure at mainline and sub mains near control valve (12.50%), chemical fertilizers with quantity (13.33%) and after care treatment of whole system (15.00 %).

Extent of adoption of management practices of drip irrigation system by the Potato grower

Adoption is a decision to make continued and full use of an innovation, Adoption is a mental process through which an individual passes from first hearing about an innovation to its final adoption.

The practice wise adoption of drip irrigation management was worked out by using the objective test developed for the purpose. The data in this regards are presented in Table 3.

The data presented in Table 3 indicate that great majority of farmers adopted the practices viz., installation of liquid fertilizer tank for drip system (91.66 %), use of filters to avoid clogging of the system (87.50 %) and cleaning of filters, nozzle (70.66 %). On the other hand the practices namely; use of air release valve (65.00 %), lateral spacing in the field on the basis of row to row distance of the crop (58.33 %) regular checking of main, sub mains, laterals and filters (57.50 %) and drippers distance on the lateral according to the type of soil and crop water requirement (55.00 %). The low adoption of practices were observed in appropriate discharge rate of drippers (37.50 %), use of pressure gauge to maintain the pressure in the system (36.66 %), maintain required pressure at mainline and sub mains near control valve (34.16%) and application of recommended fertilizers through ventury/fertilizer tank (30.83 %)

CONCLUSION

Majority of farmers had knowledge about the practices viz., seed treatment for control of the pest and diseases (96.66 %), sowing distance (91.66 %) and variety selected for table purpose were 90.00 per cent. Less number of farmers had knowledge in practices like value added products from potato for

Table 3 Practices wise adoption of drip irrigation

Sr. No.	Practice wise adoption	Number	Per cent
1.	Installation of liquid fertilizer tank for the drip irrigation system	110	91.66
2.	Use of filters to avoid clogging of the system	105	87.50
3.	Cleaning of filter and nozzle, filters to remove impurities	86	70.66
4.	Use of air release valve	78	65.00
5.	Lateral spacing in the field on the basis of row to row distance of the crop	70	58.33
6.	Regular checking of main, sub mains, laterals and filters	69	57.50
7.	Dripper distance on the lateral according to the type of soil and water requirement	66	55.00
8.	Application of plant protection chemicals (For soil borne pest/disease)	62	51.66
9.	Installation of sub mains and laterals by considering slope of the field	60	50.00
10.	Application of soluble chemical fertilizer	52	43.33
11.	Repair of MIS system	47	39.16
12.	Acid treatment and chlorination under drip irrigation system	49	40.83
13.	Appropriate discharge rate of drippers	45	37.50
14.	Use of pressure gauge to maintain the pressure in the system	44	36.66
15.	Maintain required pressure at mainline and sub mains near control valve	41	34.16
16.	Application of recommended fertilizers through ventury/fertilizer tank	37	30.83

commercial purpose (1.66 %), required pressure at mainline and sub mains near control valve (12.50%), chemical fertilizers with quantity (13.33%) and after care treatment of DIS (15.00 %). Majority of farmers adopted the practices viz., installation of liquid fertilizer tank for drip system (91.66 %), use of filters to avoid clogging of the system (87.50 %) and cleaning of filters and nozzle to remove impurities (70.66 %). The low adoption were observed in appropriate discharge rate of drippers (37.50 %), use of pressure gauge to maintain the pressure in the system (36.66 %), maintain required pressure at mainline and sub mains near control valve (34.16%) and application of recommended fertilizers through ventury/fertilizer tank (30.83 %).

(n=120)

REFERENCES

- Patel, B. Patel M. and Patel, A. 2017. Economic motivation and its relation with level of knowledge about drip irrigation system of drip irrigated banana growers. *Guj. J. Ext. Edu.* **28** (2): 285-287
- Gulkari, K. D and Chauhan, N. B. 2018. Adoption of risk management practices in drip irrigated banana cultivation. *Guj. J. Ext. Edu.* **29** (1): 86-88

The trace minerals in the body are involved in several biological processes and act as component of metallo-enzymes and enzyme co-factors apart from other vital functions. Some of these are components of hormones and thus directly regulate endocrine activities. Due to its involvement in carbohydrate, protein and nucleic acid metabolism, any change in its level may alter the production of reproductive and other hormones. Its improper level may affect embryonic development, postpartum recovery and even impair overall fertility of the animal. Thus, their estimations in blood plasma or tissue may serve as an useful guide to draw some valid inference in cases of infertility investigations. Dietary mineral elements are known to affect the physiological function in general and reproduction in particular (Hidiroglou, 1979). However, studies on the influence of various oestrus induction/synchronization therapies on plasma minerals profile of conceiving and non-conceiving dairy animals are meagre (Patel *et al.*, 2006; Butani *et al.*, 2009; Naikoo, 2012; Ammu *et al.*, 2013; Patel *et al.*, 2014). Hence, this study was undertaken under field conditions on anoestrus and repeat breeding buffaloes to evaluate the effect of various controlled breeding techniques on fertility and plasma trace minerals profile.

MATERIALS AND METHODS

This study was undertaken during breeding season from September 2012 to February 2013 on 50 pluriparous 90 to 180 days postpartum buffaloes selected from 5 villages under the milk shed area of AMUL, Anand, Gujarat. The buffaloes were initially screened gynaecologically for their reproductive status as cyclic, anoestrus or repeat breeders, and the detailed history and rectal palpation findings were recorded. Problem breeders were confirmed by rectal palpation twice 10 days apart. The buffaloes of average body condition score selected included 20 true anoestrus, 20 repeat

breeding and 10 normal cyclic/fertile (control) ones, which were subjected to different therapeutic regimes. Buffaloes in spontaneous or induced oestrus were inseminated using good quality frozen-thawed semen. All selected buffaloes were initially dewormed with 3 g fenbendazole orally and by injecting Ivermectin 70 mg s/c. Owners of the ear-marked animals were also supplied with mineral mixtures (Amul brand).

Therapeutic Management:

Twenty true anoestrus buffaloes of average BCS (2.75 to 3.50) were randomly sub-grouped and were subjected to either standard CIDR or Ovsynch protocol with FTAI on day 9 and 10, respectively (Naikoo *et al.*, 2010), except that the estradiol valerate was not used in present study with CIDR. Amongst 20 repeat breeding buffaloes of average BCS without visible and palpable genital abnormalities, 10 buffaloes having mature palpable mid-cycle CL were treated with i/m injection of PGF₂α 25 mg (Inj. Lutalyse, 5 ml) and FTAI was done twice at 72 and 96 hours later, while another 10 repeat breeding buffaloes with clear standing oestrus were inseminated and were administered simultaneously with i/m Inj. of GnRH 20 µg (Inj. Receptal, 5 ml). Ten buffaloes detected in spontaneous oestrus within 90 days postpartum and inseminated without any treatment served as normal cyclic/fertile control. The signs of oestrus and rectal palpation findings were recorded for each animal initially and at AI/FTAI. Animals in all the groups once inseminated were followed for recurrence of oestrus and in non-return cases, pregnancy was confirmed per rectum 60 days post-AI.

Blood samples were collected in heparinized vacutainers four times from jugular veins of representative numbers (n=8) of true anoestrus animals, i.e., on day 0 - just before treatment, day 7- at the time of PGF₂α administration, on day 9 (CIDR)/10 (Ovsynch)-induced oestrus/AI and on