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Research Article

MARKET POTENTIAL AND AWARENESS OF DIFFERENT FUNGICIDES FOR CONTROL OF DISEASES IN TOMATO IN ANAND DISTRICT

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Abstract: The study was conducted for Dhanuka Agritech Ltd. On "Market Potential and Awareness of Different Fungicides for Control of Disease in Tomato in Anand District". The study has covered middle Gujarat consisting of 4 Talukas and 20 villages of Anand district selected through purposive sampling method. Both primary and secondary data were used to achieve the stipulated objectives of the study. Primary data were collected with the help of structured schedule. Descriptive statistics and Garrett ranking was applied to achieve the stipulated objectives of the study. Major diseases found in tomato crop were damping off, fusarium wilt, early blight, late blight, tomato mosaic virus and leaf curl virus. According to most of the farmers, damping off and fusarium wilt attack arrives at nursery stage while early blight, late blight, leaf curl virus and tomato mosaic virus arrives after transplanting stage. In Anand districts it was found that 60% farmers responded that cost of treatment for diseases control per acre was less than ₹ 650, 27% farmers responded that it was ₹ 651-750 and remaining 13% farmers told that cost of diseases control per acre is greater than ₹ 850. Cost of treatment was depends on the price of the different fungicides. Total area under tomato crop in anand district was 1867 acre. Average quantity required per acre was as per above table and price was also mentioned in table. Thus, ₹ 2498300 is market potentiality in Anand district in tomato crop.

Keywords: Market potential, Awareness, Fungicide, Tomato

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Introduction

Indian economy is largely agrarian based in nature. Agriculture and allied activities contribute about one fourth of GDP with 58.4 percent of the population employed in agriculture. Agriculture development in the 21st century faces some unprecedented challenges with a steady growth in the world population. Increasing population exercise more pressure on the limited net cultivated area of 140 million hectares to produce the needed quantity of 240 to 250 million tons of food grains. This necessitates ensuring timely and increased availability of critical inputs like credit, fertilizers, pesticides, machinery, hybrid seed and improved packages of practices to the farmers for the increased production of food grains and vegetables [5]. India is blessed with various types of land reforms and diverse climatic conditions. Depending upon soil, bio-climate and physiography, the country has 20 agro-eco regions and 60 agro-eco sub regions. India is the world's second largest producer of rice, wheat and cotton after China and the second largest producer of sugarcane, after Brazil. It is also the second largest global producer of horticultural products. However, productivity of these crops is far lower than that of developed countries. To meet the demands of an increasing population and avoid food imports, crop productivity in India needs major improvements, which can be attained by identifying the constraints that hinder fanners in achieving high yields. India is the fourth largest producer of agrochemicals globally, after United States, Japan and China Add references serially only in number [6]. The agrochemicals industry is a significant industry for the Indian economy. Pesticides industry in India has been broadly segmented into six categories including insecticides, herbicides, fungicides, bio pesticides, plant growth regulators and rodenticides. Fungicides are biocidal chemical compounds or biological organisms used to kill fungi or fungal spores. Fungi can cause serious damage in agriculture, resulting in critical losses of yield, quality, and profit.

Objectives of the study

- To study the awareness of new fungicides and diseases complex for tomato crops
- To study the use of fungicides and their market potential in tomato crops

Research methodology

The study was carried out during 17th January 2017 to 25th April 2017 in. Anand districts of Gujarat. A total of four talukas and 20 villages from the anand districts were selected purposely. A sample of 200 farmers was drawn from 20 villages and 40 dealers were also selected. Primary survey was carried out with the help of structured schedule. Secondary data were collected from Literature, Private and Government publications and Websites. Considering the nature of study as well as for obtaining correct information from the respondent, it was decided to collect information though semi structured schedule prepared with the help of available related literature and research report. Some ambiguous points were clarified through discussing with concern export. On the basis of their suggestion, the interview schedule fixed with farmers and dealers. Total four Talukas of Anand district (Anand, Borsad, Umreth and Tarapur) was selected for survey purpose as suggested by the organization.

Limitations of the study

1. There may be bias in response of farmers due to several reasons such as social prestige, prejudices and suspicion etc.
2. A small amount of bias on part of the researchers may also exist.
3. Given all these constraints, an effort was made to minimize all limitations and to make this study more meaningful and objective

Results and discussions

General Information on Farmers

The study showed that in Anand districts, the age of farmers is very important demographic factor that influences the purchasing pattern and decision making process. According to the survey, there were 48% of farmers between 36-50 years. We can say middle age people were predominant in the region. The elderly farmers *i.e.,* who were between 51-65 years comprised 26%, young farmers' *i.e.,* 20-35 years were answered 17%., and the with the sample. Farmer's literacy means they can do their job with full knowledge and it helps in farming activities. They can read market conditions and improve their knowledge. According to study found that 67 % of Farmers respondents had pre-high school or high school education however, around 23 % farmers were graduates. The number of graduates must increase to bring about technological development and new farming activities. The land holding of the farmers is crucial as it decides the consumption of Agro-inputs and the risk bearing ability of the farmer. According to the survey, it was found that farmers have, 36% (73) farmers have land between 1-2 ha. Then after 27%(55) of farmer have less than 1 hac land and remaining 19% (37) farmer have 2-5 hac land in Anand District. It shows that majority of farmer was medium farmers. According to the survey, it was observed that in *Kharif* season 138 respondents had sown tobacco, followed by 114 respondents who had sown paddy and 19 respondents had sown pearl millet. In *Rabi* season 200 respondents had sown tomato, followed by 95 respondents who had sown Wheat, 38 respondents had sown Brinjal. In summer season 48 respondents had sown paddy, followed by 34 respondents who had sown Pearl millet. According to the survey, it was found that the 59% (117) of farmer grow the tomato on 2-5 acre land, 23% (46) farmer grow tomato on more than 5 acre while remaining 18% (37) of farmer grow tomato on less than 1 acre land. According to the survey, it was found that many diseases arrives in tomato crop. All the farmers reported that leaf curl virus arrives in tomato crop at transplanting stage. As total of 152 farmers reported damping off diseases, 86 farmers reported fusarium wilt diseases in tomato crop at nursery stage, 195 and 102 farmers reported early blight and late blight diseases arrives at transplanting stage. According to the survey, it was found that the majority of farmers use chemical method for treatment in tomato crop. 82% (165) of farmers use chemical method, 10% (20) use other method for treatment and remaining 8% (15) of farmer use biological method. In surveyed area researcher found that 18% (37) of farmers use Antracol, 16% (32) of farmers use Kocide, 13% (27) of farmers use Dhanucop, 8% (15) of farmers use Index, 7% (14) of farmers use Indofil z-78, 7% (14) of farmers use Nativo, 6% (12) of farmers use Avtar, 6% (12) of farmers use Galileo sensa and 4.5% (9) farmers use Sprint brands fungicides of different company. According to survey, Majority of respondents 54% were using two times Fungicides spray, followed by 24% were using one time and 22% were using three times per crop. Majority of the fungicides can control the diseases in a two spray. Which is directly affect to the cost of treatment.

Table-1 Cost of treatment

Cost (₹)/ acre	Frequency	Percentage (%)
Less than 650	121	60
651-750	54	27
Greater than 850	25	13

According to the survey, it was found that 60% (121) farmers say that cost of operation for diseases control is less than ₹ 650, 27% (54) farmers say that it is ₹ 651-750 and remaining 13% (25) farmers say that cost of weed control per acre is greater than ₹ 850. Cost of treatment is depends on the price of the different fungicides.

Table-2 Cultivable Area and Soil Types in Anand

Particulars	Area (000' ha)	Percentage (percent)
Geographical area	291	100
Cultivable area	205	60
Clay loam soil	81.8	39.51
Sandy loam soil	124.0	49

Farmer's preference towards different brands

Percent position = $\frac{100 (Rij - 0.5)}{Nj}$

Where:- Rij = Rank given for the ith variable by jth respondents

Nj = Number of variable ranked by jth respondents

Note: In table Garrett's rank and Garrett's score are given to different company based on the attributes

Attributes	Bayer	Dhanuka	Du Pont	Nagarjuna	Indofil	BASF	Rallis
Price	4 (48.2)	1 (60.0)	5 (44.0)	5 (39.9)	5 (39.4)	4 (46.2)	5 (41.9)
Dealers behavior	5 (41.1)	5 (55.6)	3 (46.9)	2 (54.5)	1 (56.2)	2 (54.9)	2 (54.5)
Quality	1 (57.3)	2 (55.6)	1 (60.1)	1 (60.2)	2 (54.7)	1 (55.2)	1 (55.6)
Availability	2 -54.5	3 (50.3)	2 (54.0)	3 (48.4)	4 (48.2)	5 (42.8)	4 (47.4)
Package size	3 (48.9)	4 (44.6)	4 (45.0)	4 (47.1)	3 (51.6)	3 (50.8)	3 (50.7)

Farmers were asked to give the rank to factors which they prefer for the purchasing the Bayer Brand. At the aggregate level, it was found that quality of the product was the main factor for the farmer. Whereas dealers behavior of the product least affected by farmers. Farmers were asked to give the rank to factors which they prefer for the purchasing the Dhanuka Brand. At the aggregate level, it was found that price was the main factor for the farmer. Whereas dealers behavior of the product least affected by farmers. Farmers were asked to give the rank to factors which they prefer for the purchasing the DuPont Brand. At the aggregate level, it was found that quality of the product was the main factor for the farmer. Whereas price of the product least affected by farmers. Farmers were asked to give the rank to factors which they prefer for the purchasing the Nagarjuna Brand. At the aggregate level, it was found that quality of the product was the main factor for the farmer. Whereas price of the product least affected by farmers. Farmers were asked to give the rank to factors which they prefer for the purchasing the Indofil Brand. At the aggregate level, it was found that dealers behaviour was the main factor for the farmer. Whereas price of the product least affected by farmers. Farmers were asked to give the rank to factors which they prefer for the purchasing the BASF Brand. At the aggregate level, it was found that quality of products was the main factor for the farmer. Whereas availability of the product least affected by farmers. Farmers were asked to give the rank to factors which they prefer for the purchasing the Rallis Brand. At the aggregate level, it was found that quality of product was the main factor for the farmer, whereas price of the product least affected by farmers.

General Information on Retailers

There were total 40 retailers those were surveyed. Of these, 18 retailers dealt in seeds, pesticides, and fertilizers, 10 retailers dealt in pesticides and fertilizers, and remaining 12 retailers dealt with only pesticides during the survey conducted in villages of Anand districts. From survey studies, it is evident that main fungicides of Dhanuka in which dealers deal are Kasu-B, Sixer, Cursor, Dhanucop with a dosage (per acre) of 500 mL, 400 g, 250 g, 1000 g respectively. From survey studies, it is evident that main fungicides of Bayer in which dealers deal are antracol, aliette, Melodi, Navito, Sectin with a dosage (per acre) of 500 g, 450 g, 400 g, 400 g, 600 g respectively. From survey studies, it is evident that main fungicides of Du Pont in which dealers deal are Kocide, Curzet (powder), Equation Pro, Galileo Sensa, with a dosage (per acre) of 400 mL, 600 mL, 500 mL, 800 mL respectively. From survey studies, it is evident that main fungicides of Nagarjuna in which dealers deal are Index, Combi Plus, Mass Plus, Sivic with a dosage (per acre) of 450 g, 700 g, 300 mL, 500 g respectively. From survey studies, it is evident that main fungicides of Rallis in which dealers deal are Blitox, Ishaan, Master, Samarth, Sultaf with a dosage (per acre) of 500 g, 100 g, 400 g, 500 mL, 500 g respectively. From survey studies, it is evident that main fungicides of Other Companies in which dealers deal are Saaf, Unilax, Uthane M 45, Indofil Z-78, Ridomil, Amistar Top, Blue Copper, Sahara, Leo M-45, Ultra with a dosage (per acre) of 500 g, 450 g, 600 g, 1000 g, 200 g, 500 g, 450 g, 300 mL, 450 g, 700 g respectively. From the studies it was found that fungicides are used in tomato crop of different companies, out of Bayer's products, Nativo with a dosage of 500g/acre is the highest priced product at ₹ 3500/acre, whereas Antracol with a dosage of

500g/acre is least priced at ₹ 350. Out of Dhanuka's products, Dhanucop with a dosage of 1000g/acre is the highest priced product at ₹ 780/acre, whereas Sixer with a dosage of 500g/acre is least priced at ₹ 240. Out of Ralli's products, Master with a dosage of 250mL/acre is the highest priced product at ₹ 480/acre, whereas Ishaan with a dosage of 100g/acre is least priced at ₹ 220. DuPont has introduced only one product in this category- Equation Pro with a dosage requirement of 500g/acre and priced at ₹ 420.

Market Potential of fungicides

Total are under tomato crop could potential market for fungicides. Primary data were collected from farmers and after analysing it market potential is calculated using following formula.

Table-2 Market Potential of Fungicides under tomato crop

	Casu-B	Sixer	Dhanucop
Total area under cultivation	204905 ha		
Area under Tomato crop	830 acres		
Avg. Quantity required per acre (mL/acre)	500 mL	500 g	1000 g
Cost of Fungicides per 500 mL	485	240	780 (1000g)
Application required	2	2	2
Market Potential	₹ 805100	₹ 398400	₹ 1294800
Total market potential	₹ 2498300		

Total area under tomato crop in anand district was 830 acre. Average quantity required per ha was as per above table and price was also mentioned in table. Thus, ₹ 24, 98,300 is market potentiality in Anand district in tomato crop.

Conclusions

The major crop grown in the region are tomato, tobacco, pearl millet, paddy, wheat and Brinjal. Major diseases found in tomato crop are damping off, fusarium wilt, early blight, late blight and leaf curl virus. It was noted that 54% are using two times Fungicides spray, followed by 24% are using one time and 22% are using three times per crop. It was found that 60% farmers say that cost of operation for diseases control is Rs. 550-650, 27% farmers say that it is Rs. 651-750 and remaining 13% farmers say that cost of diseases control per acre is Rs. 751-850. It was found that out of Bayer's products, Nativo with a dosage of 500gm/acre is the highest priced product at Rs.3500/acre. whereas Antracol with a dosage of 500gm/acre is least priced at Rs.350. Out of Dhanuka's products, Dhanucop with a dosage of 1000gm/acre is the highest priced product at Rs.780/acre, whereas Sixer with a dosage of 500gm/acre is least priced at Rs.240. Out of Ralli's products, Master with a dosage of 250ml/acre is the highest priced product at Rs.480/acre, whereas Ishaan with a dosage of 100gm/acre is least priced at Rs.220/acre. DuPont has introduced only one product in this category- Equation Pro with a dosage requirement of 500gm/acre and priced at Rs.420/acre. Total area under tomato crop in anand district was 830 acre. Average quantity required per ha was as per above table and price was also mentioned in table. Thus, ₹ 24, 98,300 is market potentiality in Anand district in tomato crop.

Application of research: This research is helpful for organization to know the product potential related to crop and current market players and their market share. Organization can also identify their product preference from the farmer or consumer. Organization can redesign the strategy to increase their market share.

Research Category: Fungicides

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References

[1] Etebarian H.R. (1992) *Iranian J. Agricultural Sciences*, 23,1-14.
[2] Abhinandan D. Randhwa H. S. and Sharma R. C. (2004) *Annual Biology*, 20, 211-218
[3] Solanki D., Panchal N. and Desai P (2013) *Consumer Buying Behaviour towards Agriculture Culture Inputs: An Empirical Study in Rural Area of Bardoli, Global research analysis*, 2(6), 117-118
[4] Choudhary P (2014) *Market Share, Market Potential and Farmer's Perception of Fungicide on Chilies Crop in Khargone District With Reference To Dhanuka Agritech Ltd. Madhya Pradesh, M.B.A (Agriculture), Thesis, Dept. of agricultural economics and Farm management, J.N.K.V.V., Jabalpur*.