

**RESEARCH ARTICLE :**

Direct sown paddy with seed drill - Adoption status of Krishna district farmers in Andhra Pradesh

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SSUMMARY : In Krishna district of Andhra Pradesh, majority of the farmers were cultivating rice in a traditional method *i.e.*, transplanting of rice under tanks and canals as source of irrigation. Due to late receipt of the water in the canal tail end regions, sowing of the second crop is becoming late which leads to yield loss. In future, water and labour availability may worsen which may lead to increased competition for these aspects. Therefore, Krishi Vigyan Kendra, Ghantasala endeavored to create awareness on direct sown paddy with seed drill and has been promoting this method since 5-6 years. Andhra Pradesh State was selected purposively for this study and the survey was conducted in Krishna district. 120 rice growers were considered for the present study. The data was collected from the farmers through personal interview with the help of pre-tested scheules and questionnaire. The results showed that 51.66 per cent of the respondents belonged to high adoption category, followed by 29.16 per cent belonged to medium adoption and 19.16 per cent of the respondent belonged to low adoption categories which means partial adoption of direct sown paddy with seed drill respectively. As per recommendations of the Scientists of Krishi Vigyan Kendra, Ghantasala, more than half of the respondents had high level of adoption. It can be concluded that direct sown paddy is getting more popular in Krishna district and farmers are more motivated towards adoption of the technology. More than half of the farmers are adopting the recommended package of practices. So, farmers should be motivated to adopt 100 per cent technology which created a positive impact on farming community.

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BACKGROUND AND OBJECTIVES

Because of population growth and dietary pattern demand for rice is increasing in India. India is the largest grower of rice in the world and it occupies the largest cropped area of 44.2 M ha with a total production of 112.91 Million tones with an average productivity of 2578 kg per hectare (Source: Annual report 2018-19, Department of

Agriculture, 2018). In Andhra Pradesh, rice is the major food crop grown in an area of 16.25 lakh ha with an average production of 84.59 lakh tonnes (Source: Annual report 2018 -19, Department of Agriculture,2018) followed by in Krishna district of Andhra Pradesh, paddy is grown in 2, 30,475 ha in which direct sown paddy accounts for around 50,000 ha. In Krishna district, majority of the farmers

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were cultivating rice in a traditional method *i.e.*, transplanting of rice under tanks and canals as source of irrigation. Transplanting of rice entails adequate land preparation both for nursery and main field, consumes 20 per cent of the total water requirement ha⁻¹ (1240 mm) and requires 25 to 30 man days for its establishment manually depending on soil type. Conventional rice cultivation needs 3000-5000 liters of water to produce 1 kg of rice. Due to vagaries of monsoon in the district and delay in the rains aggravates the labour demand situation. Water is becoming scarce in many regions and it's feared that man made climate changes will trigger variations in precipitation that jeopardize rice production. Receipt of water under canals and tanks is seen in the second week of August or much later, as a result farmers face water shortage, delayed and limited release of irrigation water from canals is observed. Due to late receipt of the water in the canal tail end regions, sowing of the second crop is becoming late which leads to yield loss. In future, water and labour availability may worsen which may lead to increased competition for these aspects. Therefore, need of the hour is to sustain the production of the rice in pace with population growth with reduced water and labour use. According to Srilatha and Srilatha Vani (2015), comparative economics of DSP and TPP method of paddy cultivation revealed that there is a difference in cost of cultivation which is nearly Rs.9000 to 10,000/ ha. Therefore, Krishi Vigyan Kendra, Ghantasala endeavored to create awareness on direct sown paddy with seed drill and has been promoting this method since 5-6 years by organizing field demonstrations, trainings to farmers and farmers' scientists interaction meetings. This study was formulated to find out the adoption of direct sown paddy by the farmers in Krishna district.

RESOURCES AND METHODS

Andhra Pradesh State was selected purposively and the survey was conducted in Krishna district. KVK, Ghantasala was undertaken this study during 2018-19 in Krishna district of Andhra Pradesh. For the study, random sampling technique was adopted in designing sampling frame. Accordingly, three mandals were selected and six villages were selected randomly based on potentiality. From each of the selected villages, twenty number of rice growers *i.e.* 120 rice growers were considered for the present study. The data was collected from the

farmers through personal interview with the help of well prepared pre-tested schedules and questionnaire. The data collected were subjected to statistical analysis to get inferences. Percentage analysis was used in descriptive analysis for making simple comparisons. Percentage was corrected to two decimal places.

Table A: Selected mandals, villages and respondents in Krishna district of Andhra Pradesh

| Sr. No. | Name of the mandal | Name of village | Number of selected farmers |
|---------|--------------------|-----------------|----------------------------|
| 1. | Challapalli | Challapalli | 20 |
| | | Mangalapuram | 20 |
| 2. | Bantumilli | Bantumilli | 20 |
| | | Kanchadam | 20 |
| 3. | Mopidevi | Pedaprolu | 20 |
| | | Pedakallaepalli | 20 |
| Total | | | 120 |

OBSERVATIONS AND ANALYSIS

Adoption is a mental process through which an individual passes from first hearing about an innovation to its final adoption. It refers to a decision for full scale continued use of an innovation over a period of time. He is subjected to many other considerations, before the final decision is taken to adopt the recommended technology. As a result, the technology recommendation gets different level of adoption by the users. In between, the adopter tests the innovation in question for its suitability and applicability under his farm conditions. In the present study, an effort was made to ascertain the farmers' adoption level of direct sown paddy cultivation technology practices in Krishna district. Table 1 shows the adoption level of farmers on major aspects of direct sown paddy cultivation technology.

The results obtained from the present investigation as well as relevant discussions have been summarized in Table 1.

From Table 1, the component wise analysis of adoption of the practices of direct sown paddy cultivation technology reveal that 80.00 per cent of the farmers have adopted summer plough to control the emerging weeds, 60.00 per cent of the farmers have adopted levelling the field before sowing which is very important aspect in direct sown and 75 per cent of the farmers are well trained for maintaining the soil moisture and adopted the technology. In Krishna district, farmers are very

progressive and 70.00 per cent were adopting the recommended seed rate per acre. The main motto of the technology is to save the cost cultivation along with water, so farmers were very particular about the seed rate in order to save the cost on seed. But regarding seed treatment half of the farmers were somewhat lagging behind to adopt the technology, only 55.00 per cent of the farmers are adopting the technology. They

felt that, purchasing the seed from input dealers was itself treated with some chemicals. According to the onset of the monsoon and climatic conditions, farmers were taking up the sowings in time to mitigate the obstacles for second crop. 60.00 per cent of the farmers were sowing the crop in time and also 75.00 per cent were maintaining the depth of sowing in direct sown paddy.

Weed competition reduced multiple rice yield

Table 1 : Adoption of recommended practices in direct sown paddy by rice farmers

| SR. No. | Recommended practice | Extent of adoption | | | | | |
|------------|--|--------------------|-------|-------------------|-------|-------------|-------|
| | | Fully adopted | | Partially adopted | | Not adopted | |
| | | F | % | F | % | F | % |
| I | Field preparation | | | | | | |
| 1. | Plough the fields during summer to control emerging weeds | 80 | 66.7 | 10 | 8.3 | 30 | 25.0 |
| 2. | Leveling the field before sowing | 60 | 50.0 | 40 | 33.3 | 20 | 16.7 |
| 3. | Sufficient soil moisture | 75 | 62.5 | 10 | 8.3 | 35 | 29.2 |
| II | Seed and sowing | | | | | | |
| 1. | Seed rate @ 12-15kgs per acre | 70 | 58.3 | 30 | 25.0 | 20 | 16.7 |
| 2. | Seed treatment | 55 | 45.8 | 0 | 0 | 65 | 54.2 |
| 3. | Sowing time | 60 | 50.0 | 40 | 33.3 | 20 | 16.7 |
| 4. | Depth of sowing | 75 | 62.5 | 10 | 8.3 | 35 | 29.2 |
| III | Weeding and usage of herbicides | | | | | | |
| 1. | Application of recommended pre-emergence herbicide | 55 | 45.83 | 42 | 35.00 | 23 | 19.17 |
| 2. | Recommended herbicide application 3-5 days after sowing | 71 | 59.17 | 39 | 32.50 | 10 | 8.33 |
| 3. | Application of recommended post- emergence herbicide 20-25 days after sowing | 64 | 53.33 | 37 | 30.83 | 19 | 15.84 |
| 4. | Manual weeding | 30 | 25.00 | 39 | 32.50 | 51 | 42.50 |
| IV | Irrigation | | | | | | |
| 1. | Maintaining the moisture till the seeds germinate | 41 | 34.17 | 51 | 42.50 | 28 | 23.33 |
| 2. | Intermittent irrigation at every 2-3 days upto P.I. stage to enhance tillering | 39 | 32.50 | 54 | 45.00 | 27 | 22.50 |
| 3. | Alternate wetting and drying | 56 | 46.7 | 10 | 8.3 | 54 | 45.0 |
| V | Fertilizer management | | | | | | |
| 1. | Use of organic manure | 65 | 54.2 | 20 | 16.7 | 35 | 29.1 |
| 2. | Use of recommended fertilizers | 30 | 25.0 | 10 | 8.3 | 80 | 66.7 |
| 3. | Method of fertilizer use | 55 | 45.8 | 25 | 20.8 | 40 | 33.3 |
| 4. | Use of micro nutrients | 30 | 25.0 | 5 | 4.2 | 65 | 54.2 |
| VI | Pest management | | | | | | |
| 1. | Monitoring of ETL levels before using chemicals | 6 | 5.0 | 0 | 0 | 114 | 95.0 |
| 2. | Drain the water before spraying chemicals | 15 | 12.5 | 0 | 0 | 105 | 87.5 |
| 3. | Use of correct pesticide for the control of pests | 30 | 25.0 | 10 | 8.3 | 80 | 66.7 |
| VII | Disease management | | | | | | |
| 1. | Removal of weeds from field bunds | 50 | 41.7 | 5 | 4.2 | 65 | 54.2 |
| 2. | Use of resistant varieties | 60 | 50.0 | 10 | 8.3 | 50 | 41.7 |
| 3. | Use of correct dose for the control of diseases | 42 | 35.0 | 28 | 23.3 | 50 | 41.7 |

| Sr.No. | Category | Frequency | Percentage |
|--------|--------------------------|-----------|------------|
| 1. | Low level of adoption | 23.00 | 19.16 |
| 2. | Medium level of adoption | 35.00 | 29.16 |
| 3. | High level of adoption | 62.00 | 51.66 |

components and weed biomass in wet-seeded rice was six-fold greater than in rice transplanted into puddled soil and twice as much again in dry-seeded rice sown either after dry tillage or without tillage (Singh *et al.*, 2011). Controlling the weeds in direct sown paddy is the very important aspect; farmers were educating themselves from Krishi Vigyan Kendra, Ghantasala about adopting the technology. 55.00 per cent of the farmers adopting the application of recommended pre-emergence herbicides, 71.00 per cent were in adoption of recommended herbicide application 3-5 days after sowing and 64.00 per cent farmers were adopting the recommended post-emergence herbicide 20-25 days after sowing.

Direct sown rice consumes relatively less water compared to transplanted flooded rice and saving can be much higher during deficit rainfall situations compared to transplanted rice. Water availability is the main problem in the tail end areas of Krishna eastern delta region so depending on the availability of the water farmers were irrigating the fields. Less than half of the farmers (41.00 %) were maintaining the moisture till the seeds germinate and 56.00 per cent were adopting the alternative wetting and drying.

Application of right quantity of fertilizers at right time by right method is the key for proper growth of any crop. Balanced fertilization in terms of supplementary use of organic manures (65.00%) was adopted by more than half of the farmers when compared to use of micro nutrients (30.00 %). Even though Krishna district farmers were very progressive in adopting the innovative technologies when we come to usage of recommended fertilizers, very less farmers (30.00%) were adopting the recommendations and only 55.00 per cent were adopting the recommended methods of fertilizer use.

Pests and diseases are major biotic constraints to achieve self sufficiency in ensuring food security. However, negligence in endemic areas can result in complete crop failures. Pest monitoring, adoption of recommended technology and proper decision to manage any pest is very important. Only 6.00 per cent of the

farmers monitoring the ETL levels before using the chemicals, 15.00 per cent were draining out the water before spraying the chemicals and farmers were very lagging behind in using the recommended dose of correct pesticides. Only 30.00 per cent of the farmers were adopting the correct pesticide usage for the control of the pests.

Farmers were very interested and innovative to take the resistant and high yielding varieties, 60.00 per cent of the farmers were adopting the resistant varieties, half of the farmers were removing the weeds from field bunds for management of diseases and less than half (42.00 %) of the farmers were adopting the correct dose for the control of diseases.

Table 2 indicated that 51.66 per cent of the respondents belonged to high adoption category, followed by 29.16 per cent belonged to medium adoption and 19.16 per cent of the respondent belonged to low adoption categories which means partial adoption of direct sown paddy with seed drill, respectively. As per recommendations of the Scientists of Krishi Vigyan Kendra, Ghantasala, more than half of the respondents had high level of adoption.

Conclusion:

On the basis of the findings, it can be concluded that direct sown paddy is getting more popular in Krishna district and farmers are more motivated towards adoption of the technology. More than half of the farmers are adopting the recommended package of practices. But some of the farmers were still lagging behind to adopt the technology. Especially in case of monitoring the ETL levels before using the chemicals farmers were still not following the ETL levels and going for high dose of pesticides before incidence of pest. So, farmers should be motivated to adopt 100 per cent technology which created a positive impact on farming community.

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