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Impact of training programme on conservation agriculture for managing crop residues

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Abstract

The KVK Katihar under the jurisdiction of Bihar Agricultural University, Sabour, Bhagalpur provided training on Conservation Agriculture (CA) for managing crop residue. An evaluation study was conducted to assess the impact of the training programme on farmer's perception regarding conservation agriculture. This study 'Impact of the training programme on conservation agriculture for managing crop residues' were conducted by Krishi Vigyan Kendra (KVK), Katihar in five purposively selected villages of Katihar with sample size of 150 people following proportionate random sampling from adopted villages. The collection of data from the selected respondents was made with the help of pre-tested structured schedule using personal interview method. Before participating in the training session, only 4.00 percent of the respondents had a positive perception of Conservation Agriculture for managing crop residue; after participating in the training programme, this number increased to 29.33 percent. The 'low perception category' for conservative agriculture was 62.00 percent before the training programmes, and it was lowered to 34.66 percent after the training. Weed infestations, tillage practices and scientific manpower were all key issues that farmers faced when using Conservation Agriculture to manage crop residue. KVK's endeavors, which included a training programme, had a significant impact on the farming community in adoption of conservation agriculture for managing crop residue in Katihar.

Keywords: Training, impact, adoption, conservation agriculture, crop residue

Introduction

As India is an agrarian economy, a majority of the land is used for farming of wide range of crops in its different agro-ecological regions. According to the Ministry of New and Renewable Energy (MNRE, 2009) ^[14], Government of India has estimated that about 500 MT of crop residues are generated every year. These residues are used as animal feed, for thatching of homes, and as a source of domestic and industrial fuel. Recent research efforts have developed conservation agriculture-based crop management technologies which are more resource-efficient than the conventional practices. Crop leftovers can be used effectively in conservation agricultural practices, although information on their usage is limited. Traditionally crop residues have numerous competing uses such as animal feed, fodder, fuel, roof thatching, packaging and composting. Rice straw and husk are used as household fuel or in boilers for parboiling rice. Farmers use crop wastes themselves or sell them to landless households or intermediaries who then sell them to industries. The remaining residues are left unused or burnt on-farm. The conservation agriculture, which is advocated as an alternative to the conventional production system, has been adopted by the Food and Agriculture Organization (FAO) of the United Nations as a lead model for improving productivity and sustainability. The RCTs with innovations in residue management avoid straw burning, improve soil organic carbon, enhance input efficiency and have the potential to reduce GHGs emissions (Pathak *et al.* 2010) ^[17]. Conservation agriculture, with the following three core inter-linked principles, is a viable option for sustainable agriculture and is an effective solution to check land degradation (Kassam, 2009) ^[9]. Minimizing mechanical soil disturbance and seeding directly into untilled soil to improve soil organic matter content and soil health. This protects the soil surface, conserves water and nutrients, promotes soil biological activity and contributes to integrated pest management.

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Keeping these facts in mind, Krishi Vigyan Kendra, Katihar organized training programmes on Resource Conservation Technologies (RCTs) for Crop Residues Management and its Impact on Soil Health to improve Crop Productivity. The KVK imparted need-based and skill-oriented training to the practicing farmers, rural youth and extension functionaries.

Materials and Method

The investigation was an attempt to study the impact of the training programme on Conservation Agriculture for Managing Crop Residues. The study and training was conducted in Katihar district of Bihar during 2018-19. Out of sixteen blocks of Katihar district, the highest numbers of trainee participation were observed from Korha, Mansahi & Katihar blocks. The final selection of villages from each block was based on the availability of farmers trained from KVK, Katihar. The selected villages were Musapur from Korha block; Sirsa from Katihar block; Bhermara, Fulhara & Lahsa from Mansahi block were purposively selected. The total 150

trained farmers were enlisted and selected as respondents for the study. The collected data were analyzed with the help of a suitable statistical test.

Results and Discussion

Table 1 revealed that when it comes to soil testing, the majority of trained farmers (46.00 percent) have a high perception of conservation agriculture for managing crop residue, followed by 27.33 percent of trained farmers who have a medium perception, and only 26.66 percent of trained farmers who have a low perception. In terms of Nutrient management, most of the trained farmers (44.00%) had a 'high perception' about Nutrient Management, followed by 35.33% of trained farmers had medium and 20.66% trained farmers had a 'low perception' about nutrient management. While, majority of the trained farmers (64.00%) had a 'medium perception' about water management, followed by 21.33% of trained farmers had low and 14.66% trained farmers had a high perception about water management.

Table 1: Effect of Training on Perception of farmers regarding conservation agriculture for managing crop residue

| S. No. | Conservation Agriculture for Managing crop residue | Perception (n = 150) | | | | | |
|--------|--|----------------------|-------|--------|-------|------|-------|
| | | Low | % | Medium | % | High | % |
| 1. | Introduction to CA | 11 | 7.33 | 56 | 37.33 | 83 | 55.33 |
| 2. | Implementation of CA | 59 | 39.33 | 82 | 54.66 | 9 | 6.00 |
| 3. | Soil testing | 40 | 26.66 | 41 | 27.33 | 69 | 46.00 |
| 4. | Planting following CA principles | 51 | 34.0 | 91 | 60.66 | 8 | 5.33 |
| 5. | Integrated Pest and Disease Management | 26 | 17.33 | 62 | 41.33 | 62 | 41.33 |
| 6. | Nutrient Management | 31 | 20.66 | 53 | 35.33 | 66 | 44.00 |
| 7. | Crop Rotation and Intercropping | 22 | 14.66 | 49 | 32.66 | 79 | 52.66 |
| 8. | Management of Crop residue in CA | 26 | 17.33 | 112 | 74.66 | 12 | 8.00 |
| 9. | Improved Agricultural Implements for CA | 64 | 42.66 | 78 | 52.00 | 8 | 5.33 |
| 10. | Water Management | 32 | 21.33 | 96 | 64.0 | 22 | 14.66 |

In case of application of management of crop residue in Conservation Agriculture (CA), majority of the trained farmers (74.66%) had a 'medium perception' followed by 17.33% of trained farmers had 'low perception' and 8.00% trained farmers had a high perception about management of crop residue. In case of Crop rotation and intercropping, majority of the trained farmers (52.66%) had a 'high perception' followed by 32.66% of trained farmers had 'medium' and 14.66% trained farmers had a 'low perception' about Crop rotation and intercropping. Further, most of the trained farmers (41.33%) have a 'high' and 'medium perception' followed by 17.33% of trained farmers had a low perception about Integrated Pest and Disease management. With Regards to planting following CA principles, majority of the trained farmers (60.66%) had a 'medium perception' followed by 34.00% of trained farmers had 'low' and 5.33% trained farmers had a high perception about CA based planting. In case Introduction to CA, majority of the trained farmers (55.33%) had a 'high perception' followed by 37.33% of trained farmers had 'medium' and 7.33% trained farmers had a 'low perception' about the conservation Agriculture. Majority of the trained farmers (54.66%) had a 'medium perception' followed by 39.33% of trained farmers had 'low' and 6.00% trained farmers had a 'high perception' about the implementation of conservation Agriculture. Agricultural implements play a vital role in case of Conservation agriculture and majority of the trained farmers (52.00%) had 'medium perception' followed by 42.66% 'low' and 5.33 had 'high perception' regarding use of improved agricultural implements. Table 2 shows that, prior to participating in the training programme, the majority of the beneficiaries (62.0 percent) had a 'low perception' followed by 34.00 percent of those with a 'medium perception' and only 4.00 percent of

those with a 'high perception' of conservation agriculture for managing crop residues. Following the training, the majority of respondents (47.33 percent) fell into the 'medium' group of perception followed by the 'low' category (34.66 percent) and the 'high' category (29.33 percent) for organic farming technique or conservation agriculture for crop residue management.

Table 2: Distribution of respondents according to their perception of conservation agriculture for managing crop residues 'before' and 'after' participating in training program

| S. No. | Categories | Respondents (n=150) | | | |
|--------|------------|---------------------|-------|-------|-------|
| | | Before | | After | |
| | | No. | % | No. | % |
| 1. | Low | 93 | 62.00 | 52 | 34.66 |
| 2. | Medium | 51 | 34.00 | 71 | 47.33 |
| 3. | High | 6 | 4.00 | 44 | 29.33 |

The majority of the respondents had a medium to high perception of conservation agriculture for crop residue management as a result of their participation in the training session, and the foregoing observations were consistent with Saxena & Singh's findings (2000) [19].

Constraints perceived by farmers while during adoption of Conservation Agriculture for managing crop residue

Table 3 shows that in the study region, weed infestation in the adoption of Conservation Agriculture was the most common problem experienced by farmers (79.00%) and was placed first, followed by mindset about tillage indicated by 76.00% of respondents and ranked second. The third most common response about constraints was skilled and scientific

manpower, which was started by 73.33 percent of respondents. 68.66 percent of respondents said they didn't have the right seeder, which came in fourth place while with

64.00 percent respondents, crop residue for livestock feed and fuel were ranked fifth major constraints.

Table 3: Distribution of respondents according to various constraints faced by them in using conservation agriculture for managing crop residues

| S. No. | Constraints | Beneficiaries | | Rank |
|--------|---|---------------|-------|------|
| | | No. | % | |
| 1. | Infestation of weeds | 119 | 79.00 | I |
| 2. | Mindset about tillage | 114 | 76.00 | II |
| 3. | Skilled and scientific manpower | 110 | 73.33 | III |
| 4. | Lack of appropriate seeder | 103 | 68.66 | IV |
| 5. | Crop residues for livestock feed and fuel | 96 | 64.00 | V |
| 6. | Financial Constraints | 85 | 56.66 | VI |
| 7. | Infrastructural Constraints | 66 | 44.00 | VII |

Around Fifty seven percent respondents also reported about his poor financial conditions and ranked as sixth major constraints. The other limitation was Infrastructural constraints as seventh ranked problem by 44.00% respondents.

The correlation coefficient of attributes of trained farmers with their Impact of Training Programme on Conservation Agriculture for managing crop residue is furnished in table 4.

Table 4: Relationship between attributes of trained farmers and their perception about Conservation Agriculture for managing crop residue

| S. No. | Particulars | Correlation Coefficient |
|--------|---------------------------------|-------------------------|
| 1. | Age | 0.031 * |
| 2. | Education | 0.431** |
| 3. | Caste | 0.062* |
| 4. | Size of family | 0.367** |
| 5. | Social participation | 0.053* |
| 6. | Size of land holding | 0.314** |
| 7. | Annual income | 0.504** |
| 8. | Source of information | 0.326** |
| 9. | Contact with extension personal | 0.539** |
| 10. | Innovativeness | 0.306** |

* Non-Significant ** Significant at $p=0.005$ level

It can be observed from the table that correlation coefficients in respect of education (0.431), size of family (0.367), size of landholding (0.314), annual income (0.504), source of information (0.326), contact with extension personnel (0.539), and innovativeness (0.306) were found positive and established significant relationship with Impact of Training Programme on Conservation Agriculture for managing crop residue at 5% level of significance, while age (0.031), caste (0.062), social participation (0.053) were found non-significant relationship with the Impact of Training Programme on Conservation Agriculture for Managing crop residue. The above finding supports the view expressed by Behera *et al.*, (2010) [3].

Conclusion

The above study can be concluded that, only 4.00 percent of respondents had a positive opinion about Conservation Agriculture for Managing Crop Residue before participating in the training, but this number improved to 29.33 percent after participating in the training under the study 'Impact of Training Programme on Conservation Agriculture for Managing crop residue'. Weed infestation, tillage mindset, and skilled and scientific labour were all key issues that farmers faced when using Conservation Agriculture to manage crop residue in this study.

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