Acta Scientific AGRICULTURE (ISSN: 2581-365X)

Volume 7 Issue 3 March 2023

Research Article

Advent of Intercropping of Ramdana with Chilli in Outbreak of Monsoon for Natural Hazards Protection

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Received: August 10, 2022

Published: February 02, 2023

Abstract

The experiment was carried out during two consecutive years in monsoon period at village *Kanharpura*, district Jalaun, Bundelkhand of Uttar Pradesh. The operational area of Model Watershed, Rendhar, Jalaun Bundelkhand was selected for this study. The main objective was to protect the chilli, crop from natural hazards. The ravines affected land of experimental area was reclaimed with different soil and water engineering measures. The experimental soil was Parwa, having low nutrients status. In chilli + ramdana intercropping, chilli, roots washed with water and dipped the seedling in plant originated systemic insecticide registered higher green fruits yield by 95.10 q/ha closely followed by chilli + ramdana intercropping where topping of chilli seedling was done yielded green fruits to 93.00 q/ha. The normal intercropping of chilli + ramdana without any additional activity gave lowest yield of green fruits by 91.30 q/ha. Not much variation was found in the yield of intercropped ramdana. The incidence of white flies, thrips and aphids (Myzus sp.) was found absent in chilli crop. The leaf curl disease (mosaic) was also found nil throughout the crop period of chill.

Keywords: *Myzus pericae*; Natural Hazzered; Ravines affected land; Thrips; White Fly

Introduction

Chilli crop can be grown almost all the year round, where winters are mild and monsoon or the rains are not very heavy. It is a crop of a few months duration and can be grown almost of any time of the year. However, the main crop which is rainfed is sown during month of May and June and transplanting is done from middle of July. In Uttar Pradesh where irrigation facilities are available, its seed is sown about six week before the monsoon and it transplanted in the fields with the outbreak of monsoons. During monsoon period the leaf curl or mosaic, caused by a virus and is characterized by curling of leaf margins inward or upward and crumpling of intravenous areas. In case of severe attack the leaves usually falls off, obstructing the growth of the plant. This disease usually spreads through insect vectors such as white fly, thrips and aphids etc. Generally this problem was noted during rainy season cultivation of chilli, which reduce the fruits yield and quality of chilli.

Ramdana (locally called "*Rajgra*") is a small seeded and minor crop of ravines affected area of BundelKhand region of U.P. and dryland farm families harvest the crop with poor productivity without any incidence of insects, pest and diseases.

It is well known that chilli crop is most susceptible for mosaic disease. This disease is transmitted through white flies etc. In degraded land of Bhundelkhand region of U.P., cultivation of chilli and ramdana was introduced on farmers fields, the selected farmers were reeling below the poverty line and having small holdings. It was observed that chilli grown alone suffered from mosaic disease due to incidence of white flies, thrips and aphids. But the farmers grown the chilli crop around the ramdana fields, which was showed free from the mosaic disease and white flies thrips and aphids incidence. On the basis of this observation the intercropping of ramdana with main crop of chilli was plan for farmers fields. The flexible plan of chilli and ramdana intercropping was made and carried out on the farmers fields, is the subject matter of this manuscript.

Materials and Methods

The present study was carried out during two consecutive years in monsoon period at village *Kanharpura*, district Jalaun,

Bundelkhand of Uttar Pradesh. The operational area of Model Watershed, Rendhar, Jalaun Bundelkhand was selected for this experiment. The main objective was to protect the chilli crop from the mosaic and white flies, thirps and aphids with cropping system manipulation and improve the income of farm families reeling below the poverty line. The ravines affected land of pilot area was reclaimed with different soil and water engineering measures. The experimental soil was *Parwa* (sandy loam), having pH 7.6, organic carbon 0.21%, total 0.02%, available phosphorus 8.8. kg/ha and available potash 221 kg/ha. The pH was determined by Electrometric glass electrode method [1], white organic carbon was determined by Calorimetric method [2]. Total nitrogen was analyzed by Kjeldahl's method as discussed by Piper (1950). The available phosphorus and potassium were determined by Olsen's method [3] and Flame photometric method [4], respectively. The three treatments were tested i.e., chilli + ramdana, chilli + ramdana (Topping of chilli seeding) and chilli + ramdana (chilli roots wash with water and dipped seeding in plant originated systemic insecticide). The seed was sown in nursery bed in first week of June and transplanted in third week of July during both experimental years. In intercropping system, crops were planted in the row ratio of 5:1. The five rows of cilli seeding of cv. Kalyanpur Chaman was transplanted and in place of six rows chilli, ramdana cv. local was sown. Thus 83% plant stand of chilli and 17% plant stand ramdana were adjusted. Planting distance was maintained 45 x 30 cm. The recommended dose of NPK i.e., 60:30:50 kg/ha was given to both crops. The chilli was grown for the purpose of green fruits harvesting when they are fully mature and before they turn to red from green. The fruits were picked at frequent intervals, mostly twice a week. Ramdana was harvested after full mature stage. The recommended conservation agronomical practices were followed in the raising of both crops. The crops were irrigated with protective irrigations as and when required. The experiment was laid out on ten farers fields.

Results and Discussions

The pooled yield of green fruits of chilli and ramdana and appearance of white flies, thrips and aphids (*Myzus persicae*) were recorded and reported in table 1 and discussed here under appropriate heads.

S. N.	Treatments	Yield (q/ha)		Chilli yields increased		Appearance of insects/diseases.	
		Chilli	Ramdana	(q/ha)	(%)	White flies, thrips and aphids	Leaf curl (Mosaic)
1	Chilli + Ramdana	91.30	1.65	-	-	Nil	Nil
2	Chilli + Ramdana (Topping of Chilli seedling)	93.00	1.72	1.70	1.86	Nil	Nil
3	Chilli+Ramdana (Chilli roots wash with water and dip seedling in plant originated systemic insecticide)	95.10	1.76	3.80	4.16	Nil	Nil

Table 1: Effect of intercropping on yield and incidence of insects and diseases (Pooled data of two years).

- Yield of main and intercrop: Results display that chilli + ramdana, chilli roots washed with water and dipped seedling in plant originated systemic insecticide registered higher yield of main crop of chilli by 95.10 q/ha compared to other two tested treatments. The roots treatment and seedling dipped, prevented the attack of thrips, white flies and aphids. After a week time the chilli strike new roots and get established. These findings support to suggestion of Chauhan (1972) [5]. In chilli + ramdana intercropping, where topping of chilli seedling gave yield by 93.00 q/ha. The growing of chilli + ramdana under normal intercropping exhibited lowest yield of chilli by 91.30 q/ha. The topping of chili in the nursery beds in the morning of sunny day at 8to 10 days before transplanting, produced better and thicker seedling, which was set their roots quickly in the field. Topping was also kept off the leaf curl disease caused by thrips on tender top leaves. These findings support to suggestion of Chauhan (1972).
- Not much variation was found in the yield of intercropped ramdana.
- Appearance of insects and leaf curl disease: Very careful study was made on this aspect. The incidence of white flies, thrips and aphids (*Myzus* sp.) was found nil in chilli crop. Similarly, leaf curl disease (mosaic) was also noted nil throughout crop period of chilli. This was due to intercropping of ramdana in chilli.

Figure 1: Intercropping of Chilli and Ramdana visited by farmers.

Conclusion and Recommendation

At outbreak of monsoon, the intercropping of ramdana with main crop of chilli protected from the natural hazards i.e., from the "leaf curl" disease. Therefore, the farming majority of dry formed area may be suggested for intercropping of ramdana with chilli and harvest the fruits of newly generated technology.

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