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FIELD EVALUATION OF IN - SITU MOISTURE CONSERVATION PRACTICE

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ABSTRACT

A field experiment was conducted for two years during north-east monsoon period to study the effect of *in-situ* water harvesting measure on different crops under rainfed condition at the Agricultural College and Research Institute, Killikulam, Tamil Nadu. Among the moisture conservation practices, contour ploughing was significantly superior to contour bunding but was on par with broad based ridging. Economics wise cowpea and castor were found to fetch more profit.

KEY WORDS : Moisture conservation, contour ploughing, contour bunding, broad based ridging

India is situated in the tropical belt and experiences extreme variations in rainfall across the country. Obviously for such a large country there can be no single strategy for utilisation of rain water. Run-off water removes the top fertile soil and reduces the root profile. One of the approaches to utilise rain water where it falls is *in-situ* moisture conservation. Sowing on flat utilising the available moisture and ridging later was found to increase the yield of crops (ICRISAT, 1984). Ridges and furrow method of sowing pearlmillet helped in getting higher yield at Anantapur (Yellamanda Reddy *et al.*, 1992).

According to Velayudham *et al.*, (1994) under red soil conditions of Chidambaranar district of Tamil Nadu, contour ploughing and broad-based ridging were better in situ moisture conservation practices. Stability in dryland agriculture can be achieved by adopting improved moisture conservation practices (Kolter, 1990)

MATERIALS AND METHODS

A field experiment was conducted during the north-east monsoon period of 1991-92 and 1992-93 at Agricultural College and Resarch Institute, Killikulam, Tamil Nadu. The soil of the experimental site was clayey skeletal typic rhodustalfs, with pH 7.2, low in available N (180 kg/ha), medium in P_2O_5 (19 kg/ha) and high in K_2O (550 kg/ha). The rainfall received during the crop-growth period was 219.9 mm in the first year, in 10 rainy days and it was 441.4 mm during the second year in 25 rainy days. The experiment was laidout in split-plot design. The treatment combinations include three *in-situ* water harvesting measures (contour bunding, contour ploughing and broad - based ridging in main plots) and five crops *viz.*, foxtail millet (*Setaria italica* (L.) P.Beauv.), little millet (*Panicum sumatrense* Roth. ex Roem & Schult), cowpea (*Vigna unguiculata* (L.) Walp), horse gram (*Macrotyloma uniflorum* (Lam.) verd.) and castor (*Ricinus communis*L.) in sub-plots. The crop management practices were followed as per the Crop Production Guide (Anon., 1991)

RESULTS AND DISCUSSION

The grain yield data and benefit-cost ratio are furnished in Table 1. Among the moisture conservation practices, contour ploughing was significantly superior to contour bunding but was on par with broad-based ridging during both the years of experimentation.

Significantly higher grain yield was recorded by foxtail millet followed by cowpea, little millet,

Table 1. Effect of *in-situ* moisture conservation practices on yield of rainfed crops

Treatment	Grain yield(q/ha)		Benefit cost ratio	
	1991-92	1992-93	1991-92	1992-93
Moisture conservation practice				
Contour bunding	8.68	8.05	-	-
Contour ploughing	9.74	9.65	-	-
broad-based ridging	9.32	9.08	-	-
CD (P=0.05)	0.73	0.75	-	-
Rainfed crop				
Horse gram	7.98	7.92	1.41	1.40
Cowpea	9.56	9.04	2.01	1.90
Foxtail millet	12.23	11.50	1.28	1.20
Castor	7.39	7.42	1.85	1.86
Little millet	9.02	8.75	1.14	1.10
CD(P=0.05)	0.41	0.43	-	-

horse gram and castor. Economicswise, cowpea and castor have been found to fetch more profit. From the study, it could be concluded that contour ploughing and borad-based ridging were better *in-situ* moisture conservation practices for red soils of Chidambaranar district of Tamil Nadu.

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INTEGRATED MANAGEMENT OF TOMATO FRUIT BORER WITH INSECTICIDES, NEEM PRODUCTS AND VIRUS

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ABSTRACT

Field trials were conducted to assess the efficacy of insecticides, neem products and *Helicoverpa* nuclear polyhedrosis virus (NPV) as an individual component and integrated components in controlling fruit borer. *Helicoverpa armigera* in tomato. Application of NSKE 3% + endosulfan 0.035% + NPV @250 LE/ha thrice at 45, 55 and 65 days after planting was found to be superior in causing higher larval mortality and reducing the fruit damage with higher fruit yield followed by application of neem oil 3% + endosulfan 0.035% + NPV @250LE/ha and endosulfan 0.07%. When the cost benefit ratio was considered, endosulfan 0.07% stood first followed by NSKE 3% + NPV @250 LE/ha and NSKE 3% + endosulfan 0.035% + NPV @250 LE/ha. Thus the integrated approach may also be adopted in place of insecticides for the better control of *H. armigera* and higher return in tomato.

KEY WORDS : *Helicoverpa armigera*, tomato, integrated management.

The gram caterpillar, *Helicoverpa armigera* (Hubn.) is a pest on many field and horticultural crops in India and its severity was more during cooler months. Efficacy of insecticides (Hari Radhavendra Rao *et al.*, 1990), neem seed extract spray (Abdul Kareem, 1980) and nuclear polyhedrosis virus (NPV) (Santharam *et al.*, 1981) was reported earlier on a number of crops. Very limited reports are available for the control of *H. armigera* in tomato. Thus, the study was made to find out the efficacy of insecticides, neem products and Heliothis NPV in an integrated approach.

MATERIALS AND METHODS

Field trials were conducted for three seasons during 1989-1990 to 1991-1992 at Macheri Sheep Research Station, Pottaneri. The efficacy of insecticides, neem products and NPV in controlling the fruit borer, *H. armigera* was tested on Paiyur 1 tomato variety in a randomised block design with nine treatments and three replications (Table 1). In each season, three rounds of sprayings (650 l spray fluid/spray) were given at 45,55 and 65 days after planting. Observations on the number of larvae present on five plants and number of fruits damaged were taken at 10 days after each spray. Yield data were also recorded for healthy fruits.

RESULTS AND DISCUSSION

The results showed significant differences among the treatments for larval mortality and fruit damage by *H.armigera*. All the treatments were significantly superior to control. The mean data showed that higher larval mortality was observed in