

EFFECT OF *Leucaena leucocephala* BARRIERS AND BUND ON EROSION LOSSES AND YIELD OF PEARLMILLET + MOTHBEAN

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ABSTRACT

A field experiment was conducted for 5 years (1999-2004) at Solapur, to study the effect of vegetative barrier of *leucaena leucocephala* and mechanical bund on erosion hazard and yield of rainfed pearl millet + mothbean (2:1) intercrop in shallow black at 1.2% slope. Vegetative barrier reduced the runoff by 67.94% and soil loss by 68.27% in comparison with farmers practice. The corresponding reduction with mechanical bund was 55.1% and 58.3%, respectively. The grain yield of pearl millet increased by 11.61% and 6.65% in vegetative barriers and mechanical bund, respectively, when compared with farmers practice where no treatment was given.

Key words : Runoff, Soil loss, Nutrient loss, Soil and Water Conservation, Vegetative barrier

Out of 142.2 mha net cultivated area of India, about 67 % is rainfed which contributes 44 per cent of the total production and supports 40 per cent population. Soil moisture stress, low and erratic rainfall, excessive runoff, soil and nutrient losses in absence of soil and water conservation measures are the major factors for low productivity under rainfed farming. The annual production of food grains can be boosted by development of rainfed area through conservation and better management of rain water.

The effectiveness of vegetative barriers in reducing erosion hazards and improving yield of crops has been reported from various parts of the country (Ranade *et al.*, 1997; Subudhi *et al.*, 1998; Mishra and Sahu 2001 and Prasad *et al.*, 2005). Under AICRP under dryland agriculture at Solapur, Bijapur and Akola also indicates that effectiveness of vegetative barriers is reducing soil erosion hazards and improving the yield of rainfed crops was better than graded bunds.

The present study was conducted to study the effectiveness of vegetative barrier and mechanical bunds on soil and water conservation and yield of pearl millet + mothbean intercrop.

MATERIALS AND METHODS

The study was conducted on shallow black soils at Zonal Agricultural Research Station, Mahatma Phule

Krishi Vidyapeeth, Solapur, for five years from 1999 to 2004 during *kharif* season. Non-replicated field trials were conducted with three treatments. The treatments were Vegetative barrier of two rows of *Leucaena leucocephala* at 15 m horizontal interval (T₁) Mechanical bund at 60 m interval (T₂) and Farmers' practice without soil and water conservation measures (T₃). The plot size for each treatment was 0.36 ha. The automatic stage level recorders with H-flume were installed at every treatment for regular monitoring of runoff. The rainfall and runoff were measured after every rainy day at 08.30 hrs. The total runoff was collected in a tank. The thoroughly mixed runoff samples of one liter were collected for each runoff event for each treatment for analysis of the soil and nutrient loss for individual treatment. The pearl millet and mothbean intercrop 2:1 was sown in each plot in *kharif* every year except 2004-2005. The grain yield was recorded for each treatment. The soil samples were taken for determination of soil moisture with the help of gravimetric method. On the basis of this moisture use was determined. The runoff for each treatment in mm per year was calculated. The data recorded and analyzed in respect of runoff and soil loss is presented in Table 1, while, the yield data are depicted in Table 2.

RESULTS AND DISCUSSION

Runoff, soil and nutrient loss :

The data on runoff and soil loss presented in Table 1 revealed that the rainfall causing runoff received during