



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(12): 1074-1075
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www.thepharmajournal.com
Received: 03-10-2023
Accepted: 06-11-2023

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A study on sustainable intensification of maize under intercropping with pulse at Mahabubnagar district of Telangana state

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Abstract

This experiment was conducted consecutively from *Kharif* 2015 to *Kharif* 2017. Intercropping of Maize with Redgram at 2:1 ratio as field trial in Mahabubnagar district, of Telangana state, India to harness good returns from the complimentary component crops. When Maize crop is faced with prolonged dry spells complete loss of the crop is very common, hence, intercropping it with redgram assures farmers some yields compensating the main crop. Pooled data over three years indicated that intercropping of maize with redgram at 2:1 row ratio on an average recorded 75.5 per cent yield increase when compared its yield equivalents with sole maize and B:C ratio of 2.4 in intercrop and 1.72 in sole crop was realized.

Keywords: Maize, redgram, intercropping, equivalent yield, B:C ratio

Introduction

Intercropping of legumes with cereals is a recognized practice for economizing the use of nitrogenous fertilizers and increasing the productivity and profitability per unit area and time. One of the main reasons for higher yields in intercropping is that component crops are able to use growth resources differently and make better overall use of natural resources than grown separately (Willey, 1979) [6]. A careful selection of crops having different growth habit can reduce the mutual competition to a considerable extent. The redgram being deep rooted and slow growing in its early growth stage, during which the more rapidly growing crop like maize can be conveniently intercropped to utilize the natural resources more efficiently (Willey *et al.*, 1981) [7]. In view of this, present investigation was conducted to harness good returns from intercropping redgram with maize at 2:1 row ratios at 5 locations in farmer's fields of Mahabubnagar district.

Materials and Methods

The field trial area was located at 15°55'-17°29' N, & 77°15'-79°15' E, Mahabubnagar District of Southern Telangana Agroclimatic Zone, with seasonal variations in temperature and precipitation receiving mean annual rainfall 596.4 mm. The experiment was conducted under rainfed conditions for three consecutive years, *Kharif* 2015 to 2017. The Soils were sandy loam with medium in texture. In the experiment intercropping was an additive series of Maize + Redgram at 2:1 row ratio was compared with Farmers practice of sole crop Maize. The crops were sown during 1st week of June with onset of monsoon, both the crops were harvested and redgram yield was converted in to maize equivalent yield to calculate system productivity and B: C ratio was drawn, to evaluate economic feasibility of the technology.

Results and Discussion

This experiment was conducted consecutively from *Kharif* 2015 to *Kharif* 2017. Intercropping of Redgram along with Maize in 2:1 ratio has given good returns and remunerative to the farmers in dry spells. In the year 2015-16, B: C ratio was 0.7 in redgram intercrop with maize and 0.3 in sole crop Maize, in 2016-17, B: C ratio was 4.1 in redgram intercrop with maize and 3.6 in sole crop Maize and in 2017-18, B: C ratio was 2.5 in redgram intercrop with maize and 1.28 in sole crop Maize. Pooled data over three years indicated that intercropping of redgram and maize at 2:1 row ratio recorded 75.5 per cent yield increased when compared with yield equivalents with sole crop Maize and B: C ratios 2.4 in redgram intercrop with maize and 1.72 in sole crop Maize was realized.

Table 1: Pooled data of yield and B: C ratio of intercrop (Maize+ Redgram) and sole Maize

| S. No. | Year | Intercropping | | | Farmer Practice | B: C ratio | |
|--------|---------|---------------|----------------|--------------|-----------------|---------------|-----------------|
| | | Maize | MEY of Redgram | System yield | Maize Kg/ha | Intercropping | Farmer Practice |
| 1 | 2015-16 | 618 | 2544 | 3162 | 1292 | 0.7 | 0.3 |
| 2 | 2016-17 | 4900 | 1037 | 5937 | 5000 | 4.1 | 3.6 |
| 3 | 2017-18 | 3041 | 2419 | 5460 | 2666 | 2.5 | 1.28 |
| | Average | 2853 | 2000 | 4853 | 2764 | 2.4 | 1.72 |

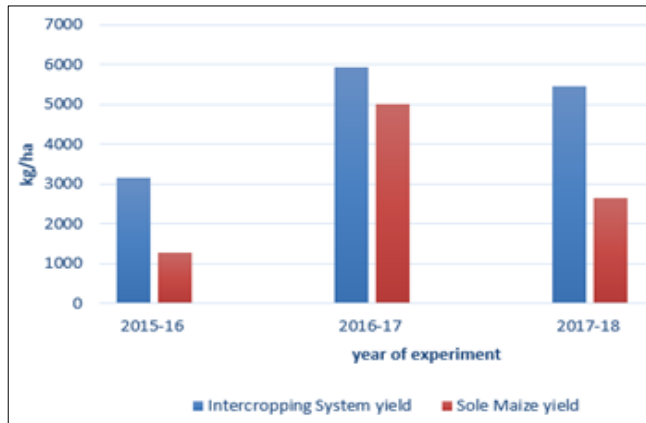


Fig 1: System productivity of Maize +Red gram and sole maize

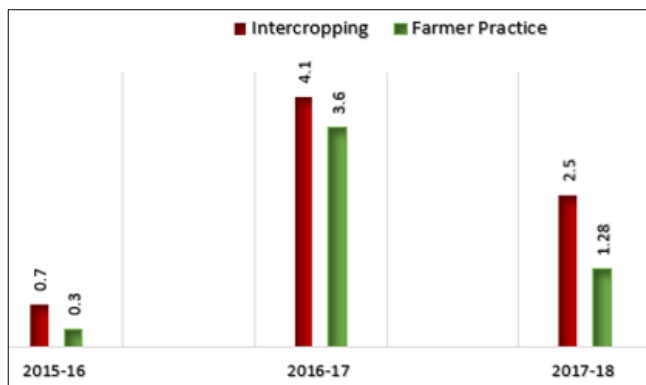


Fig 2: B: C ratio of Maize +Red gram and sole maize

Conclusion

This experiment was conducted consecutively from *Kharif* 2015 to *Kharif* 2017. Intercropping of Redgram along with Maize in 2:1 ratio at 5 locations of Mahabubnagar district to harness good returns from the component crops. When Maize crop is faced with prolonged dry spells complete loss of the crop is very common, hence, Intercropping with Redgram assures farmers some yields compensating the main crop. Pooled data over three years indicated that intercropping of maize + redgram at 2:1 row ratio recorded 75.5 per cent yield increase when compared with yield equivalents with sole crop Maize and B:C ratios 2.4 in redgram intercrop with maize and 1.72 in sole crop Maize was realized. It is best cropping pattern in frequent dry spells hitting areas. This technology is recommended as an alternative to sole crop Maize under rainfed situation

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