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On farm weed control in turmeric (*Curcuma longa* L.)

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ABSTRACT

Turmeric is an important spice crop and India is its largest producer, however, its cultivation weeds are the major problem. It was found that integration of straw milch with herbicides very effective control of all the weeds for a long time.

Key words : *On farm weed control, Turmeric, Curcuma longa L.*

Turmeric (*Curcuma longa* L.) is an important spice crop and India is its largest producer, consumer and exporter. It can play an important role in crop diversification in present day cereal intensive agriculture. Besides its use as spice in kitchen, it is also used in cosmetic products and in various medicines. In turmeric cultivation, however, weeds are the major problem (Hossain, 2005). It is so because it took a long time to emerge and develop a canopy structure sufficient to compete with the weeds. After emergence, turmeric has slow early growth and this early growth period coincide with rainy season. So weeds pose a major problem during this period. Being a long duration crop, turmeric is heavily infested with both summer, winter annuals and perennials which compete with crop for moistures, space, air and nutrients. Thus any single method of weed control is not effective in this crop; a combination of different approaches is desirable to obtain long term weed control and potential yield from this crop. On station trials conducted at Ludhiana (India) indicated that Integrated use of paddy straw mulch and herbicides are effective in turmeric (Kaur *et al.*, 2008). This promising technology was replicated at farmers' field in Faridkot district in Punjab at three locations during 2009-10 to see the effectiveness of different weed control methods under practical situations.

Turmeric cv. Raja Rajpuri was sown at row to row spacing of 30 cm using 20 qt rhizomes /ha in April 2009. All other cultural practices and plant protection measures were followed as per recommendations of Punjab Agricultural University. The five treatments consisting of integration of paddy straw mulch @ 9.0 t/ha with pendimethalin 1.0 kg, metribuzin 0.70 kg, atrazine 0.75 kg/ha in comparison with three hand weeding (30,60 & 90 DAS) and unweeded control were evaluated at farmers' field. The field was irrigated immediately after planting. All the herbicides were applied as pre-emergence on a moist field and paddy straw mulch was immediately spread over the wet field after herbicides spray. Weed count was recorded at 30 DAS, 60 DAS and at harvesting. *Eleucine indica* (Makra), *Dactyloctenium aegypticum* (Madhana), *Digera arvensis* (Tandla), *Echinochloa crussgalli* (Swank), *Panicum colonum* (Swankee), *Digitaria sanguinalis* (Takri Ghah) were the major weed flora of trial upto 60 DAS. Some annual *rabi* weeds viz. *Phalaris minor* (Gullidanda/sitti), *Avena Ludoviciana* (Wild oats) and *Chenopodium albu*m (Bathu) also emerged at the time of data recorded at harvest in January 2010.

Data given in Table 1 indicated that Integration of straw mulch with herbicides provided very effective control of all the weeds for long time. The highest weed count at harvest (62.7/m^2) and the lowest fresh rhizome yield (91.0 q/ha) was recorded in un weeded (control) plot. The weed control treatments consisting of integration of paddy straw mulch @ 9.0

Table 1. Weed Count and fresh rhizome yield of turmeric as influenced by various weed control treatments (Mean of Three Locations)

Treatments	Weed Count/m²			Weed Control Efficiency (%)			Fresh Rhizome yield (q/ha)
	30 DAS	60 DAS	At harvest	30 DAS	60 DAS	At harvest	
Pendimethalin 1.0 kg/ha + Paddy Straw mulch @ 9.0 t/ha	3.67	6.33	16.00	80.7	81.0	74.5	148.0
Metribuzin 0.70 kg/ha +Paddy Straw mulch@9.0 t/ha	3.00	6.33	16.67	84.2	81.0	73.4	150.0
Atrazine 0.75 kg/ha +Paddy Straw mulch@9.0 t/ha	3.00	6.00	18.00	84.2	82.0	71.3	148.3
3 HW (30,60&90 DAS)	19.00*	4.33	19.67	-	87.0	68.6	148.3
Control (Unweeded)	19.00	33.3	62.67	-	-	-	91.0
Average	9.5	11.3	26.6				137.1

*Data recorded before hand weeding

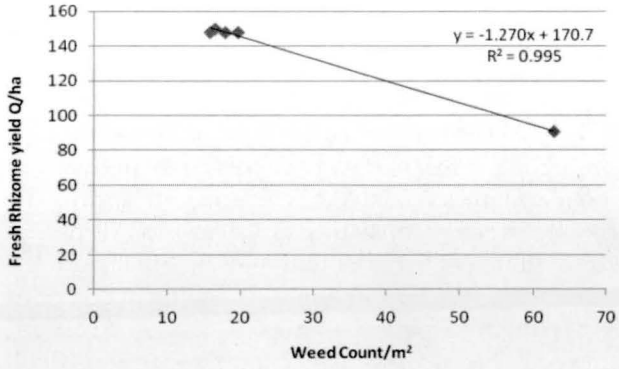

Fig. 1. Linear Regression model between weed intensity (at harvest) and fresh rhizome yield of turmeric.

t/ha with pendimethalin 1.0 kg, metribuzin 0.70 kg, atrazine 0.75 kg/ha and three hand weeding (30,60 & 90 DAS) resulted in 74.0 %, 73.0 %, 71.2 % and 68.6 % reduction in weed count (At harvest), respectively and corresponding increase of 62.6 %, 64.8 %, 63.0 % and 63.0 % in fresh rhizome yield of Turmeric crop over unweeded control treatment. The weed control efficiency of these treatments at 30 DAS, 60 DAS and at harvest ranges from 84.2 %-80.7 %, 87.0 % - 81.0 % and 74.5 % - 68.6 %, respectively. The statistical analysis of data indicated that weed intensity and fresh rhizome yield of turmeric are negatively correlated (R^2= 0.99). The linear regression model was derived for predicting fresh rhizome yield from weed count at harvest was as under:

Y= -1.270 x + 170.7 (R^2=0.995) (Fig. 1)

Where,

Y= Fresh Rhizome yield (q/ha)

X= Weed Count/ m^2

The model indicated that weed intensity accounted for 99.5 % variation in fresh rhizome yield of Turmeric crop. The reduction in fresh rhizome yield with increasing weed intensity have also been reported by Hossain *et al.* (2008).

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