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Weed control efficiency (%) as influenced by baby corn + field pea intercropping and weed management

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Abstract
A field experiment was conducted during *rabi* season 2010-2011 and 2011-2012 at the Agricultural Research Farm, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh (India). To study the Effect of Planting pattern and Weed management in Baby corn (*Zea mays* L.) intercropped with Field pea (*Pisum sativum* L.). Weed control efficiency did not differ significantly due to various planting pattern. However, paired row planting system and normal planting pattern remained at par to each other and recorded higher weed control efficiency (%) than sole planting. Further perusal of the data revealed that weed management practices recorded significant variation in weed control efficiency. At 30 DAS, hand weeding at 25 DAS recorded higher weed control efficiency and remained at par to pre-emergence application of pendimethalin @ 1.0 kg ha^{-1}. However, at 60 and 90 DAS post-emergence application of imazethapyr @ 50 g ha^{-1} was significantly superior and was most effective in increasing the weed control efficiency.

Keywords: Planting pattern, field pea, baby corn, weed control efficiency

Introduction
Among the cereals, maize (*Zea mays* L.) ranks third in total world production after wheat and rice and it is principle staple food in many countries, particularly in the tropics and subtropics. Maize is considered as the “Queen of Cereals” since its multiple uses as food, feed, fodder and fuel. Being a C_4 plant, it is capable to utilize solar radiation more efficiently even at higher radiation intensity. One such vegetable is baby corn. The term Baby corn, commonly referred by the food industry, refers to the young corn of maize, harvested within 1-2 days of silk emergence. The sweet, succulent and delicious baby corn is medium plant type and provides green ears within 65-75 days after sowing (Thavaprakash *et al.* 2006) [7]. Field pea (*Pisum Sativum* L.), a native of South West Asia, is among the first crops cultivated by man. Wild field pea can still be found in Afghanistan, Iran and Ethiopia. It is an important *rabi* (cool) season pulse crop in the country, grown mainly for food along with its use as hay, green fodder and concentrates for vast cattle population as well. In India, it is cultivated in an area of about 0.78 million hectare area with annual production of 0.71 million tonne (DES, Department of Agriculture and Cooperation, 2010-2011).
Crop geometry is a cost effective technique that modifies the crop canopy structure and micro-climate, enhances crop competitiveness in weed suppression, improves the resource use efficiency and maximizes crop productivity.
Intercropping of baby corn with legumes like field pea in different planting system (1:1, 2:1, 3:1 and 2:2 row proportion etc.) produces better produce in a short period without any adverse effect on growth, development and productivity of sole crop and it also helps in soil and water conservation with increasing soil fertility and benefit:cost ratio.
Weed competition is a serious limitation in field pea due to its slow initial growth resulting in huge yield loss to the extent of 65.8% under unweeded condition (Mishra 2006) [3].

Materials and methods
The present experiment was conducted at the Agricultural Research Farm, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh (India) during *rabi* season 2010-2011 and 2011-2012. The climate of this region is sub-humid climate being often subjected to extremes of weather conditions. The rainfall received during the crop growing

season amounted to 22.1 mm. The maximum rainfall of 7.2 mm was recorded during the week 14 (April, 02-08), while minimum was 0.6 mm in week number 47 (November, 19-25), 2010.

During the main crop growing season maximum temperature was in the range of 35.0 to 14.2°C whereas minimum temperature was in the range of 19.0 to 4.8°C. The temperature at the time of harvesting was 31.8°C. The soil of the experimental plot was typical Indo-Gangetic alluvium (Order-Inceptisols) which in general are deep, flat, well drained and moderately fertile.

The detail of experimental techniques employed for the investigation was split plot design with three replications. Four different combinations of planting pattern (sole field pea, sole baby corn, normal planting of baby corn + field pea and paired row planting of baby corn + field pea) were allotted to main plot and four different combinations of weed management practices (weedy check, hand weeding, pendimethalin and imazethapyr) were allotted to sub plot. Thus, in all total sixteen (4 main plot x 4 sub plot) number of treatment combinations were replicated thrice to make forty eight plots.

Pre-sowing irrigation was given 3 days before the land preparation. Land was prepared to a good tilth and levelled uniformly before sowing. Ploughing was done with tractor drawn disc plough followed by harrowing in criss-cross manner. Finally the field was planked and levelled. Thereafter, layout was done as per pre-decided plan of experimental design. Seeds rate @ 35 kg ha^{-1} were used for sowing of baby corn. Seeds were sown by opening furrow at 40 cm and 20 cm at normal row spacing while paired row spacing was 30 cm x20 cm. Seed rate @ 80 kg ha^{-1} was used for field pea. It was sown in furrow opened by kudali. Variety used- Malviya makka- 2, HUDP-15 (Malviya Matar 15). The recommended dose of fertilizer for baby corn was 90 kg N, 40 kg P_2O_5 and 40 kg K_2O and the recommended dose of fertilizer for field pea was 20 kg N, 40 kg P_2O_5 and 60 kg K_2O. All the required dose of nutrients were supplied through Urea, DAP and MOP.

Weed Control efficiency

The weed control efficiency was calculated on the basis of reduction in dry matter production in treated plot in comparison with the under control plot and expressed in percentage.

$$\text{WCE (\%)} = \frac{\text{DMC} - \text{DMT}}{\text{DMC}} \times 100$$

Where,
WCE = Weed control efficiency
DMC = Dry weight of weeds in unweeded plot
DMT = Dry weight of weeds in treated plot

The data statistical analysis using "Analysis of variance technique, The differences between the treatment means were tested against critical difference (CD) at 5% probability level where ever 'F' test was significant. However the data on weed population were analysed after making the square root $\sqrt{x + 0.5}$ transformation as suggested by Rangaswamy (1995).

Result and discussion

Influenced of Weed control efficiency (%) by baby corn + field pea intercropping and weed management.

The data on weed control efficiency as influenced by planting pattern and weed management practices has been presented in Table 1 and graphically in fig. 1. It is clear from the table that weed control efficiency did not differ significantly due to various planting pattern. However, paired row planting system and normal planting pattern remained at par to each other and recorded higher weed control efficiency (%) than sole planting.

Further perusal of the data revealed that weed management practices recorded significant variation in weed control efficiency. At 30 DAS, hand weeding at 25 DAS recorded higher weed control efficiency and remained at par to pre-emergence application of pendimethalin @ 1.0 kg ha^{-1}. However, at 60 and 90 DAS post-emergence application of imazethapyr @ 50 g ha^{-1} was significantly superior and was most effective in increasing the weed control efficiency. In general, all the weed management practices remained significant variation in weed control efficiency as compared to weedy check. Similar findings have been also reported by Gogoi *et al.* (1991) [2], Sinha *et al.* (2003) [6], Nagalakshmi *et al.* (2006) [4].

The weed control efficiency is inversely related to dry matter production of weeds. Regarding weed control, intercrops are more effective than sole crop and it is related to lower availability of environmental resources for weeds in intercropping system. Maximum weed control efficiency was observed with the application of imazethapyr @ 50 g/ha. This may be due to lower weed bio-mass and higher efficiency against both grassy and broad leaved weeds. Maximum weed control efficiency was observed with post-emergence application of imazethapyr. The better performance of this treatment can be ascribed to the preferential absorption of herbicides by germinating weeds seeds at initial stages particularly sedges and broad- leaved weeds.

Table 1: Influenced of Weed control efficiency (%) by baby corn + field pea intercropping and weed management (Pooled data of two years)

Treatment	Weed control efficiency (%)		
	30 DAS	60 DAS	90 DAS
Planting pattern			
Field Pea sole	28.30	33.42	23.83
Baby corn sole	30.60	33.77	22.36
Normal planting of Baby corn + Field pea	30.78	33.75	22.08
Paired row planting of Baby corn+ Field pea	30.90	33.04	23.83
SEm±	2.96	3.28	1.03
CD(P=0.05)	NS	NS	NS
Weed management			
Weedy check	-	-	-
Hand Weeding at 25 DAS	56.71	25.76	17.92
Pendimethalin @ 1.0 kg a.i. ha^{-1} at pre- emergence	54.33	44.00	30.42

Imazethapyr 50 g a.i. ha^{-1} at 20- 30 DAS	9.55	64.23	43.76
SEm±	1.79	1.64	0.76
CD(P=0.05)	5.22	4.77	2.23

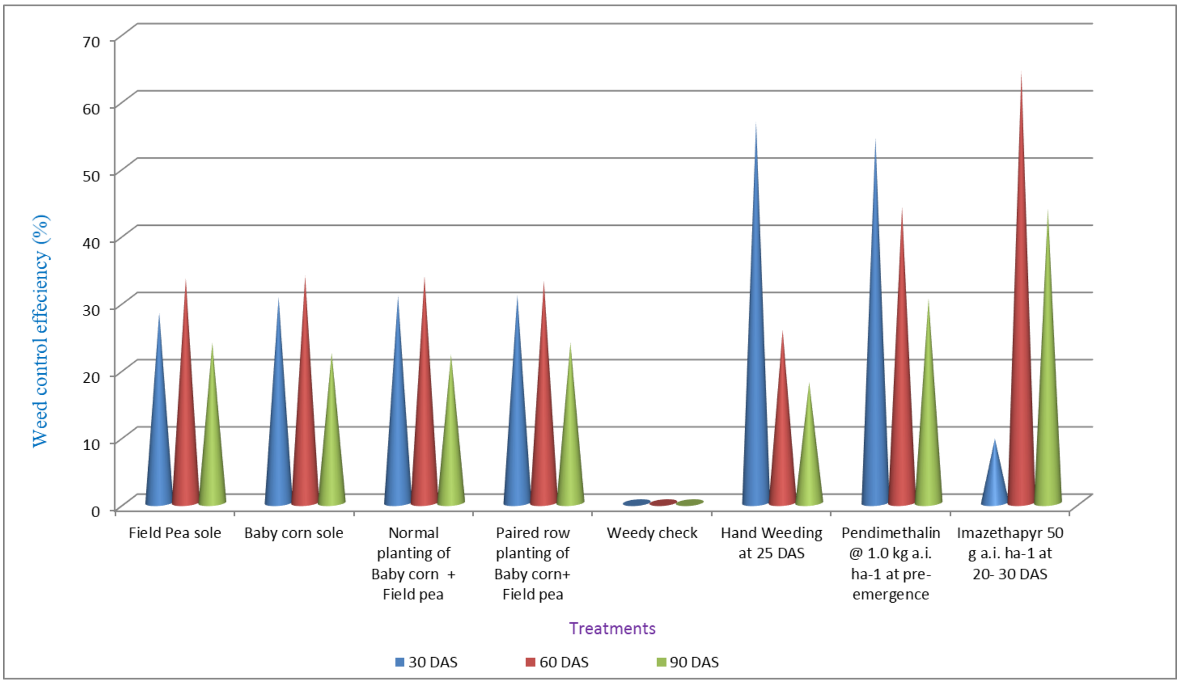

Fig 1: Influenced of Weed control efficiency (%) by baby corn + field pea intercropping and weed management

References

1. Directorate of Economics and Statistics, Department of Agriculture and Cooperation, 2011-12.
2. Gogoi AK, Kalita H, Pathak AK, Deka J. Chemical control of weeds in field peas (*Pisum sativum*). Indian Journal of Agronomy. 36: Supplement, 1991, 287-288.
3. Mishra JS. Efficacy of post emergence herbicides against wild oat in field pea. Indian Journal of Weed Science. 2006; 38:140-142.
4. Nagalakshmi KVV, Chandrasekhar, Subbaiah G. Weed management for efficient use of nitrogen in *rabi* maize. Andhra Agricultural Journal. 2006; 53(1&2):14-16.
5. Rangaswamy R. A text book of Agricultural Statistics. New Age International Publishers. 1995, 389-412.
6. Sinha SP, Prasad SM, Singh SJ, Sinha KK. Integrated weed management in winter maize (*Zea mays*) in North Bihar. Indian Journal of Weed Science. 2003; 35(3/4):273-274.
7. Thavaprakash NK, Velayudham VB, Muthukumar. Baby Corn. Agro Tech Publishers, Udaipur, India, 2006.