

Original Research Article

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## Days to 50% Tasselling, Silking and Yield as affected by Planting Pattern and Weed Management in Field Pea and Baby Corn Intercropping System

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### ABSTRACT

A two year field experiment was conducted during the *rabi* season of 2010-11 and 2011-12 at Varanasi, Uttar Pradesh. To study the Effect of Planting pattern and Weed management in Baby corn (*Zea mays* L.) intercropped with Field pea (*Pisum sativum* L.). Result showed that days to 50% tasselling of baby corn did not vary significantly due to planting pattern. Various weed management practices were effective to record significant variation in days to 50% tasselling during the course of investigation. The various planting pattern did not exhibit any significant differences in days to 50% silking. Various weed management practiced brought about significant variation in days to 50% silking. Maximum days taken to achieve 50% silking was recorded under weedy check, while post-emergence application of imazethapyr @ 50 g ha<sup>-1</sup> brought about significant reduction in days to 50% silking. There was not any significant variation in the cob yield as influenced by planting pattern. Maximum grain yield was recorded with sole planting of baby corn and minimum was recorded with paired row planting of baby corn. Maximum cob yield was recorded with the post-emergence application of imazethapyr @ 50 g ha<sup>-1</sup>. Planting pattern exhibited significant variation in recording higher grain yield in field pea. Further perusal of the data revealed that higher grain yield of 14.32 q ha<sup>-1</sup> was recorded under sole planting and application of imazethapyr @ 50 g ha<sup>-1</sup> recorded maximum grain yield of 12.00 q ha<sup>-1</sup> of field pea.

#### Keywords

Planting pattern,  
taselling, silking,  
Yield, Field pea,  
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### 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<sub>4</sub> 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). 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).

## 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 experiment was laid out in split plot design with three replications. Sixteen treatment consisted of four planting pattern *viz.* Field pea sole, Baby corn sole, Normal planting of baby corn + field pea (1:1), Paired row planting of baby corn + field pea (2:2) as main plot treatment and four weed control practices, *viz.* Weedy check, Hand weeding at 25 DAS, Pendimethalin @ 1.0 kg ha<sup>-1</sup> as pre-emergence Imazethapyr @ 50 g a.i. ha<sup>-1</sup> as post-emergence were allocated to sub-plot treatments. The experimental plot size was 14.4 m<sup>2</sup> having 4.0 m length and 3.6 m width. Treatments were separated by 1 m plot border. The same field was used in both the years. The baby corn cultivar 'Malviya makka-2' and field pea cultivar 'HUDP-15' (Malviya matar-15) were sown. Seeds rate @ 35 kg ha<sup>-1</sup> were used for sowing of baby corn. Seeds were sown by opening furrow at 40 cm x 20 cm at normal row spacing while paired row spacing was 30 cm x 20 cm. Seed rate @ 80 kg ha<sup>-1</sup> was used for field pea. It was sown in furrow opened by *kudali*. The recommended doses of NPK to baby corn was 90 kg N + 40 kg P<sub>2</sub>O<sub>5</sub> + 40 kg K<sub>2</sub>O, whereas to field pea, it was 20 kg N + 40 kg P<sub>2</sub>O<sub>5</sub> + 60 kg K<sub>2</sub>O/ha. Full recommended dose of P and K along with half

dose of N was applied as basal to both the crops in sole as well as intercropping system. Result half dose was top dressed at 30 DAS. The required quantity of herbicide was calculated as per the treatment. 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.

### **Days to 50% tasselling**

Five plants were randomly selected in the net plot area and tagged and days of full emergence of tassels were recorded separately. The number of days when 5 tassels out of the 10 emerged fully was recorded.

### **Days to 50% Silking**

Five plants were randomly selected in the net plot area and tagged and days of emergence of silk of 50% of plants were recorded.

### **Yield**

The baby cob and baby corn yield obtained as first and subsequent cobs were summed for total yield separately and presented in  $q\ ha^{-1}$ . In field pea grain yield of net plot after threshing, cleaning and drying was recorded in kg and converted to  $q\ ha^{-1}$ .

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).

## **Results and Discussion**

### **The effect of various planting pattern and weed management practices on days to 50% tasselling**

Days to 50% tasselling of baby corn did not vary significantly due to planting pattern during the course of investigation (Table-1). It is obvious from the table that the maximum duration taken for days to 50% flowering was observed with sole baby corn while minimum duration taken for days to 50% flowering was observed with normal planting of baby corn + field pea. Maximum duration for days to 50% tasselling was observed under weedy check while minimum duration recorded for days to 50% tasselling was with the post-emergence application of imazethapyr @  $50\ g\ ha^{-1}$ . Pre-emergence application of pendimethalin @  $1.0\ kg\ ha^{-1}$  remained comparable to post-emergence application of imazethapyr @  $50\ g\ ha^{-1}$ .

### **The effect of various planting pattern and weed management practices on days to 50% Silking**

It is obvious from the data (Table 1) that various planting pattern did not exhibit any significant differences in days to 50% silking. However, maximum duration taken for days to 50% silking was observed with sole planting of baby corn, while normal planting of baby corn recorded minimum days for 50% silking. Further investigation of the data (Table 1) revealed that various weed management practiced brought about significant variation in days to 50% silking. Maximum days taken to achieve 50% silking was recorded under weedy check, while post-emergence application of imazethapyr @  $50\ g\ ha^{-1}$  brought about significant reduction in days to

50% silking. Application of imazethapyr @ 50 g ha<sup>-1</sup> remained at par to pre-emergence application of pendimethalin @ 1.0 kg ha<sup>-1</sup> which recorded non-significantly less number of days to 50% silking.

**The effect of various planting pattern and weed management practices on Yield**

Data pertaining to cob yield during the course of experimentation as influenced by various planting pattern and weed management practices are presented in Table 2. It is clear from the data that there was not any significant variation in the cob yield as influenced by planting pattern during the course of study (Table 2). Maximum grain yield (18.99 q ha<sup>-1</sup>) was recorded with sole planting of baby corn and minimum (14.59 q ha<sup>-1</sup>) was recorded with paired row planting of baby corn. Sole planting recorded the higher

yield due to better availability of resources (Paulpandi *et al.*, 1998). Further analysis of the data reveals that all the weed management practices were significantly superior to weedy check in respect of cob yield. Maximum cob yield was recorded with the post-emergence application of imazethapyr @ 50 g ha<sup>-1</sup> and it was statistically at par with pre-emergence application of pendimethalin @ 1.0 kg ha<sup>-1</sup>.

However, minimum cob yield was obtained under weedy check treatment. Planting pattern exhibited significant variation in recording higher grain yield. Further perusal of the data revealed that higher grain yield of 14.32 q ha<sup>-1</sup> was recorded under sole planting of field pea. Normal and paired row planting pattern proved to be significantly inferior to sole planting in respect of grain yield. Data on grain yield indicated significant variation due to different weed control practices.

**Table.1** Days to 50% tasselling and 50 % silking of baby corn as influenced by baby corn + field pea intercropping and weed management (pooled data of two years)

Treatment	Days to 50 % tasselling	Days to 50 % silking
<b>Planting pattern</b>		
Baby corn sole	93.91	106.46
Normal planting (1:1)	92.94	105.25
Paired row planting (2:2)	93.32	105.78
SEm±	0.49	0.41
CD(P=0.05)	NS	NS
<b>Weed management</b>		
Weedy check	96.21	108.03
Hand Weeding at 25 DAS	94.12	106.78
Pendimethalin @ 1.0 kg a.i. ha <sup>-1</sup>	91.98	104.72
Imazethapyr 50 g a.i. ha <sup>-1</sup> at 25 DAS	91.23	103.78
SEm±	0.49	0.39
CD(P=0.05)	1.45	1.16

**Table.2** Yield of baby corn as influenced by baby corn + field pea intercropping and weed management (pooled data of two years)

Treatment	Baby corn yield (q ha <sup>-1</sup> )	Grain yield (q ha <sup>-1</sup> )
<b>Planting pattern</b>		
Field pea sole	-	14.32
Baby corn sole	18.99	-
Normal planting (1:1)	18.14	10.13
Paired row planting (2:2)	14.59	10.04
SEM <sub>±</sub>	0.47	0.26
CD(P=0.05)	1.83	1.01
<b>Weed management</b>		
Weedy check	15.80	10.77
Hand weeding at 25 DAS	17.36	11.52
Pendimethalin @ 1.0 kg a.i. ha <sup>-1</sup>	17.37	11.70
Imazethapyr 50 g a.i. ha <sup>-1</sup> at 25 DAS	18.43	12.00
SEM <sub>±</sub>	0.44	0.20
CD(P=0.05)	1.30	0.60

All the weed management practices recorded higher grain yield significantly over control which had the lowest grain yield. Further, data revealed that application of imazethapyr @ 50 g ha<sup>-1</sup> recorded maximum grain yield of 12.00 q ha<sup>-1</sup>. Pre-emergence application of pendimethalin @ 1.0 kg ha<sup>-1</sup> remained statistically at par with hand weeding at 25 DAS in producing significant grain yield. Sole planting recorded the higher yield due to better availability of resources. This confirms the findings of Rani *et al.*, (2011). Weed management practices did brought about a marked variation in the yield attributes of baby corn.

There was significant variation in the yield of baby corn due to application of imazethapyr as application of herbicide reduced the density and dry matter of weeds, due to this competition for resources was reduced resulting in increased yield of baby corn.

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