



P-ISSN: 2349-8528  
 E-ISSN: 2321-4902  
 IJCS 2019; 7(1): 250-252  
 © 2019 IJCS  
 Received: 13-11-2018  
 Accepted: 17-12-2018

**VB Shambharkar**  
 Assistant Professor,  
 Department of Forestry  
 Dr. Panjabrao Deshmukh Krishi  
 Vidyapeeth, PO. Krishinagar,  
 Akola, Maharashtra, India

**RKS Tiwari**  
 Professor,  
 TCB College of Agriculture and  
 Research Station, Indira Gandhi  
 Krishi Vishwa Vidyalyaya,  
 Bilaspur, Chhattisgarh, India

**SW Choudhari**  
 Assistant Professor  
 Department of Forestry  
 Dr. Panjabrao Deshmukh Krishi  
 Vidyapeeth, PO. Krishinagar,  
 Akola, Maharashtra, India

**Correspondence**  
**VB Shambharkar**  
 Assistant Professor,  
 Department of Forestry  
 Dr. Panjabrao Deshmukh Krishi  
 Vidyapeeth, PO. Krishinagar,  
 Akola, Maharashtra, India

## International Journal of Chemical Studies

### Prospect of cultivation of *Acorus calamus* Linn. (Bach) under rainfed rice (*Oryza sativa* L.) ecosystem

**VB Shambharkar, RKS Tiwari and SW Choudhari**

#### Abstract

*Acorus calamus* Linn. (Bach) is one of the commercially important medicinal plant species, required its cultivation in large acreage to fulfill the demand in herbal market. Conditions favourable for rice cultivation have also been found suitable for Bach cultivation. Present study was therefore undertaken with aim to study the prospects of cultivation of *Acorus calamus* under rainfed rice ecosystem. During Kharif 2003, an experiment was laid out in randomized block design taking *Acorus calamus* (Bach) as mixed crop and as inter crop with rice. *Lathyrus sativus* (Lathyrus) and *Lepidium sativum* (Chansoor) were taken as relay crops under *Utera system of cultivation* during rabi season. Yield and yield components of were recorded from different treatments. To compare the merits and demerits of cultivation of Bach as inter crop and mixed crop with rice, equivalent yield of all treatments to rice yield were calculated. Results indicated that cultivating *Acorus calamus* as an inter crop or mixed crop with rice did not affect the growth and yield of rice. Number of effective tillers in rice planted alone and in combination with *Acorus calamus* were at par. However, growth and yield of *Acorus calamus* planted with rice was significantly affected. Moreover, Lathyrus and Chansoor taken as relay crop under *Utera system* did not affect the growth and yield of *Acorus calamus*. Equivalent yield obtained from different treatments indicated that cultivation of *Acorus calamus* alone (112.28 q/ha) and with Lathyrus (144.62 q/ha) under rainfed rice ecosystem seems to be more suitable over traditional cultivation of rice alone (76.33 q/ha) or with Lathyrus (106.01 q/ha). Chansoor which is also an important medicinal plant did not grow well under *Utera* system of cultivation.

**Keywords:** Bach, *Acorus calamus*, Rice, *Oryza sativa*, *Utera*, Equivalent yield

#### Introduction

Rice is grown as major staple food for 2.7 billion people in Asia alone (FAO, 1999) [2]. In Chhattisgarh, rice crop occupies 3.9 million ha area under rain fed situation. However, uncertainty of rains during the crop growth stage caused several crop failure in the past. *Utera* or relay cropping (Ghosh and Mondal, 2002) [3] of succeeding crop in standing rice crop prior to harvest is predominant in Chhattisgarh under rainfed condition. Lathyrus crop has capability to successfully grow and survive under scarcity of water and is very popular among the farmers in Chhattisgarh (Sharma *et al.*, 2002) [4]. *Acorus calamus* (Bach) which is one of the commercially important medicinal plant species and required its cultivation in large acreage to fulfill the demand in herbal market. Conditions favourable for rice cultivation have also been found suitable for its cultivation. Present study was therefore undertaken with aim to study the prospects of cultivation of *Acorus calamus* alone and with rice as an inter crop under rainfed rice ecosystem.

#### Materials and Methods

During Kharif 2003 & 2004, an experiment was laid out in randomized block design with a plot size of 4 mts x 3 mts under rainfed situation. *Acorus calamus* was transplanted with a distance of 30 cm with rice as well as alone. In the first treatment Bach was transplanted between the rows of rice while, in the second treatment Bach was transplanted in alternate rows with rice. During rabi season, lathyrus (*Lathyrus sativus*) and Chansoor (*Lepidium sativum*) were sown as *Utera* crops with rice and Bach with the available residual moisture before 25 days of maturity of rice crops. Yield and yield components were recorded from different treatments. To compare the merits and demerits of cultivation of Bach alone, with

rice and with *utera*, the actual yield of different treatments was converted into equivalent yield to rice.

### Results and Discussion

Data presented in table 1 indicated that the number of effective tillers in rice, planted alone and in combination with *Acorus calamus* were at par. Whereas, growth parameters i.e. rhizome length, rhizome diameter and number of leaves, of bach planted with rice were severely reduced. The reduction was mainly brought due to higher growth rate of rice plants



Equivalent yield obtained from different treatments indicated that cultivation of *Acorus calamus* alone (112.28 q/ha) and with Lathyrus (144.62 q/ha) under rainfed rice ecosystem seems to be more suitable over traditional cultivation of rice alone (76.33 q/ ha) or with Lathyrus (106.01 q/ha). Distribution of rainfall during the crop season was found to be most favourable (Fig. 1) the growth and yield of rice. Land use efficiency and cropping intensity of Bach have been

compared to bach. Number of effective tillers in rice was higher, when bach was transplanted in alternate rows. This may be due to more space for the growth of rice plants. *Utera* of lathyrus and chansoor did not affect the growth and yield of *Acorus calamus*. Similarly, rhizome yield of bach planted with rice i.e. between the rows and in alternate rows was severely reduced whereas, grain yield of rice planted alone and with bach was not affected. Grain yield of lathyrus taken as *utera* with rice and bach was at par moreover, did not affect the rhizome yield of Bach.

found to be higher as compared to traditional cultivation of rice. Chansoor which is also an important medicinal plant did not grow well under *utera* system of cultivation.

Present study therefore indicated that, planting *Acorus calamus* with *utera* of lathyrus found to be profitable under rain fed rice ecosystem. However, as an intercrop with rice seems to uneconomical.

**Table 1:** Comparative study on the growth and yield of Bach planted alone and in combination of paddy (Pooled data)

Treatments	Number of paddy tillers	Rhizome length/ plant (cm)	Diameter of rhizome/ plant	Length of leaves/ plant (cm)	Yield (q / ha)	Equivalent yield (q / ha)	Land use efficiency
Paddy	9.30	-	-	-	76.33	76.33	36.98
Paddy + Bach (1:1)	12.06	11.83	0.99	49.93	67.99 + 4.64	86.55	74.52
Paddy + Bach (mix)	10.06	12.83	0.81	45.65	81.10 + 5.52	103.17	74.52
Paddy + Lathyrus	9.13	-	-	-	78.66 + 15.19	106.01	66.30
Bach + Lathyrus	-	14.05	1.34	72.21	116.43 + 15.66	144.62	74.52
Bach alone	-	18.75	1.30	72.61	28.07	112.28	74.52
Paddy + Bach (1:1) + Lathyrus	13.0	11.53	0.80	53.80	71.10 + 3.18 + 17.70	115.68	74.52
Paddy + Bach (mix) + Lathyrus	8.26	12.11	0.97	44.53	77.99 + 3.55 + 17.97	124.55	74.52
Paddy + Chansoor	8.46	-	-	-	75.33 + 0.14	75.62	74.52
Bach + Chansoor	-	22.50	1.38	85.81	28.94 + 0.58	116.93	74.52
Paddy + Bach (1:1) + Chansoor	13.06	11.13	1.01	35.81	59.10 + 4.18 + 0.27	76.37	74.52
Paddy + Bach (mix) + Chansoor	9.13	14.65	1.01	56.81	74.23 + 5.98 + 0.12	98.40	74.52
C.D. (0.05)	-	-	-	-	-	16.54	
C.V. %	-	-	-	-	-	9.48	

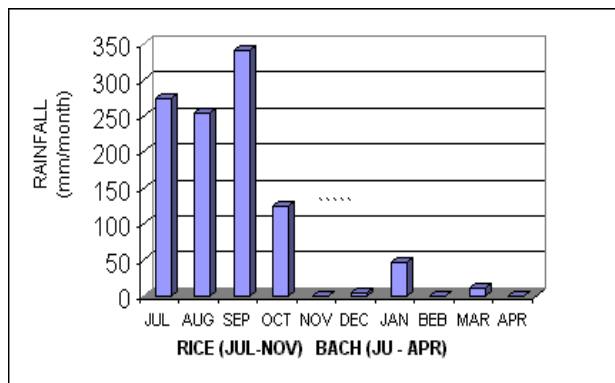
Market rate :-

Paddy – Rs 500 / quintal

Bach dry – Rs 2000 / quintal

Lathyrus – Rs 900 / quintal

Chansoor - Rs 1000 / quintal



**Fig 1:** Monthly rainfall during the crop growth period of rice (*Oryza sativa*) and bach (*Acorus calamus*)

### Acknowledgement

The authors are greatly thankful to Head, Department of Forestry, IGKV, Raipur for the continuous encouragement and providing all facility to carry out the present research experiment on farm area of the department.

### References

1. Ann. Intercropping of *Acorus calamus* (Bach) and *Bacopa monnieri* (Brahmi) with rice (*Oryza sativa* L.). Seasonal Report (kharif) 2003.
2. FAO. AGROSTATE "Information System on Food and Agriculture. FAO, Rome, 1999.
3. Ghosh A, Mondal SS. Performance of lathyrus (*Lathyrus sativus*) as utera crop in relation to growth duration of rice (*Oryza sativa* L.) under rainfed situation. Second International Agronomy Congress on Balancing Food and Environment Security - A continuing Challenge. Indian Society of Agronomy, Indian Council of Agriculture Research, National Academy of Agricultural Sciences, New Delhi, India. 2002. 1084-1085
4. Sharma RS, Kurchania SP, Dwivedi RK. Relative performance of different utera crops in rice (*Oryza sativa* L.) - based cropping system under rainfed conditions. Second International Agronomy Congress on Balancing Food and Environment Security-A continuing Challenge. Indian Society of Agronomy, Indian Council of Agriculture Research, National Academy of Agricultural Sciences, New Delhi, India. 2002, 1081-1082