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EFFECT OF SOWING DATES ON PHYTOPHTHORA BLIGHT OF TARO (*Colocasia esculenta* var. *antiquorum*)

R.C. Shakywar*, S.P. Pathak[1], Krishna S. Tomar and M. Pathak

College of Horticulture & Forestry, Central Agricultural University, Pasighat–791 102 (A.P.)

[1]Narendra Dev University of Agriculture and Technology, Kumarganj-224 229, Faizabad (U.P.)

**E-mail: rcshakywar@gmail.com*

ABSTRACT: The present investigation was carried out to evaluate the effect of date of sowing on per cent plant infection, per cent disease intensity, coefficient of disease index and yield attributes of taro (*Colocasia esculenta* var. *antiquorum*). The crop sown during 15th February gave highest cormel yield, despite maximum per cent plant infection, per cent disease intensity and coefficient of disease index in comparison to crop sown at 15th March, 15th April and 15th May during the *Kharif* 2006 and 2007 cropping season, respectively.

Keywords: *Taro, Phytophthora colocasiae, sowing dates, blight*

Leaf blight of taro is caused by a destructive fungus *Phytophthora colocasiae* Racib which is highly host-specific and widely distributed disease on a large number of crops. Taro is also known as colocasia (*Colocasia esculenta* L.), "Arvi", "*Ghuiya*" in Hindi. The disease infected all parts of the plants (stem, leaves, petioles etc.) and caused high cormel yield losses upto the tune of 70% (Jackson and Gollifer, 4; Shakywar *et. al.,* 7). Management of the disease with some fungicides has been reported from different part of the country (Aggarwal, 1; Bergquist, 2; and Das, 3), but till date no information is available on the management of the disease through agronomic practices. In north east zone of Uttar Pradesh, taro crop is planted from 15th March to 15th April and sometimes upto the end of May. Therefore, the present investigation was undertaken to find out a suitable time of sowing along with its impact on the per cent plant infection, per cent disease intensity, coefficient of disease index and cormel yield.

MATERIALS AND METHODS

The present investigations were carried out at Main Experiment Station, Vegetable Science, NDUA&T, Kumarganj, Faizabad, Uttar Pradesh, during *Kharif* season of 2006 and 2007 using highly susceptible variety Narendra Arvi-2 in plot size of 3.6 x 3.0 m and spacing of 60 x 30 cm with three replications. The sowing of crop was done at four different dates starting from February 15th to May 15th at an interval of one month. The crop was regularly observed for the first appearance of the disease. The various parameters of disease viz. per cent plant infection, per cent disease intensity, coefficient of disease index and cormel yield (q/ha) were also recorded after maximum expression of the disease symptoms. All the observations were taken at weekly intervals and 10 plants were randomly selected from each plot by using 0-5 disease rating scale (Prasad, 6). The per cent plant infection, per cent disease intensity, coefficient of disease index and cormel yield (g/plant) were also calculated by following formulas.

$$\text{Per cent plant infection} = \frac{\text{Infected plants}}{\text{Total plants}} \times 100$$

$$\text{PDI (Per cent disease intensity)} = \frac{\text{Sum of numerical rating}}{\text{Total no. of plants observed} \times \text{Maximum rating}} \times 100$$

$$\text{CODEX} = \frac{\text{PPI} \times \text{PDI}}{100}$$

CODEX=Coefficient of disease index

PPI = Per cent plant infection

PDI = Per cent disease intensity

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Table 1. Effect of sowing dates on per cent plant infection, per cent disease intensity, coefficient of disease index and cormel yield of taro during 2006 and 2007.

Sowing dates	Kharif 2006				Kharif 2007			
	PPI	PDI	CODEX	Cormel yield (q/ha)	PPI	PDI	CODEX	Cormel yield (q/ha)
15 February	91.10 (72.61)	58.21 (49.71)	53.02	138.14	92.30 (73.86)	62.13 (52.00)	57.34	133.24
15 March	78.21 (62.15)	49.14 (44.49)	38.43	134.50	80.21 (63.62)	51.42 (45.80)	41.24	131.43
15 April	69.21 (56.27)	39.21 (38.75)	27.13	128.12	72.16 (58.13)	42.13 (40.46)	30.40	125.12
15 May	65.47 (53.99)	30.57 (33.55)	20.01	116.13	67.12 (55.22)	31.42 (34.08)	21.71	113.24
CD (P = 0.05)	2.58	2.80		7.58	2.64	2.91		7.21

(Figures in parentheses are arcsine transformed value)
PPI = Per cent Plant Infection, PDI= Per cent Disease Intensity, CODEX= Coefficient of disease index

$$\text{Cormel yield (g) per plant} = \frac{\text{Total yield (g)}}{\text{No. of plants}}$$

RESULTS AND DISCUSSION

Leaf blight in all the crops can be greatly affected by agronomic management practices. The data presented in Table 1 revealed that during *Kharif* 2006, when the planting of crop was done on four different dates starting from 15th February and continued upto 15th May at an interval of one month, per cent plant infection, per cent disease intensity and coefficient of disease index were recorded significantly reduced to 69.21 and 65.47, 39.21 and 30.57, 27.13 and 20.01 per cent, respectively, when planting were done in 15th April and 15th May. Whereas, 15th February and 15th March planting showed significant increase of 91.10 and 78.21, 58.21 and 49.14, , 53.02 and 38.43 per cent, respectively in per cent plant infection, per cent disease intensity and coefficient of disease index, respectively. However, 15th February planting gave highest cormel yield (138.14 q/ha) which was at par with 15th March (134.50 q/ha) which was significantly superior over rest of planting date despite very high, per cent plant infection, per cent disease intensity and coefficient of disease index.

Similarly in *Kharif* 2007, per cent plant infection, per cent disease intensity and coefficient of disease index were significantly reduced to 72.16 and 67.12, 42.13 and 31.42, 30.40 and 21.71 per cent when planting was done at 15th April and 15th May respectively, whereas 15th February and 15th March planting showed significant increase of 92.30 and 80.21, 62.13 and 51.42, 57.34 and 41.24 per cent plant infection, per cent disease intensity and coefficient of disease index, respectively. However, 15th February planting gave highest yield 133.24 q/ha being at par was at par with 15th March 131.40 q/ha, On the basis of above finding it was found that 15th February planted crop recorded maximum per cent plant infection, per cent disease intensity and coefficient of disease index. Despite above the maximum cormel yield was also recorded in same date and found superior to others date of sowing. The results are in conformity with work of Misra (5) who reported higher yield and maximum per cent plant infection and disease intensity when colocasia

crop was sown on 1st May and 15th May. Similarly, Sharma (8) also reported that early sowing of pea crop in the month of October escaped the damage of powdery mildew and maximum yield was also obtained. Likewise, Sharma (9) also reported that early sowing of methi in the last quarter of October escaped powdery mildew disease and recorded maximum yield.

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