

SHORT COMMUNICATION

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An experiment was conducted to find out the effect of intercropping on severity of the disease and to seek an alternate cultural management of early blight of potato. The experimental result showed that the severity of early blight disease could be minimized by intercropping with marigold followed by carrot, radish and garlic. Therefore, for better management of the disease the proper agronomic practices should be integrated with the application of fungicides. This will reduce the number of sprays of fungicides and reduce the health hazards caused by application of fungicides.

Key words: *Alternaria solani*, cultural management, disease incidence, disease intensity, Early Blight, Intercropping, potato

The potato (*Solanum tuberosum* Linn.) is one of the most important vegetable crops in the world, It is a staple food in several countries particularly in Europe. It occupies the largest area under any single vegetable crop and produces more food per unit area than cereals and that too in a short period of time. Potato (*Solanum tuberosum* Linn.) is a native of South America. In India potato is grown in almost all the states under diverse climatic conditions and 82% of potatoes are grown in plains. Potato is the most popular crop in West Bengal next to cereals. Potato contributes about 3.5 times more than both wheat and paddy per unit area to the national economy in agricultural sector.

In field condition it has been observed critically that the incidence of several diseases affect the crop almost each and every year. Among them, Early

Blight disease of potato caused by *Alternaria solani* (Ellis and Martin) Jones and Grout is of major concern in potato production at present.

Therefore, the present investigation has been carried out to know the effect of intercropping on Early Blight disease and the objective of the investigation is to find out an alternate cultural management of the disease which will be able to keep severity of the disease under check so that the lesser amounts of fungicides are needed for management of the disease thereby causing less environment hazards.

The experiment was conducted at Adisaptagram Block Seed Farm, Mogra, Hooghly, West Bengal, at 9.75 m above sea level during 2011-2012 and 2012-2013 crop season following Randomized

Table 1 : Effect of intercropping on management of Early Blight of potato

Treatment	Per cent Disease incidence (%)				Per cent Disease Intensity (%)				Percent Disease reduction over control
	56 DAP	63 DAP	70 DAP	77 DAP	56 DAP	63 DAP	70 DAP	77 DAP	
T ₁	18.00 (25.47)*	28.50 (32.58)	46.38 (43.21)	53.50 (47.31)	6.65 (15.51)	9.18 (18.12)	12.92 (21.48)	15.74 (23.77)	25.17
T ₂	17.25 (24.90)	26.00 (30.98)	44.63 (42.20)	51.00 (45.86)	5.93 (14.68)	8.33 (17.29)	11.79 (20.52)	13.45 (21.93)	28.67
T ₃	14.00 (22.38)	22.00 (28.31)	39.00 (38.93)	45.50 (42.70)	5.40 (14.05)	5.99 (14.76)	8.89 (17.84)	10.17 (19.06)	36.36
T ₄	12.00 (20.70)	19.00 (26.20)	36.50 (37.45)	42.00 (40.68)	4.38 (12.75)	4.77 (13.27)	7.09 (15.99)	8.82 (17.77)	41.25
T ₅	15.00 (23.18)	23.25 (29.16)	41.88 (40.60)	47.88 (44.07)	5.74 (14.46)	7.28 (16.20)	9.69 (18.61)	11.62 (20.37)	33.03
T ₆	19.38 (26.45)	32.50 (35.04)	55.88 (48.76)	71.50 (58.06)	6.90 (15.78)	11.02 (19.84)	18.59 (25.91)	21.95 (28.28)	
SEm (±)	0.58	0.89	1.71	1.72	0.15	0.16	0.14	0.15	
CD (5%)	1.76	2.69	5.16	5.18	0.47	0.48	0.41	0.44	

*Data in the parenthesis are angular transformed values. T₁= potato+ onion; T₂= potato + garlic; T₃= potato +carro; T₄= potato +marigold;T₅= potato + radish; T₆ = potato (sole crop).

Block Design (RBD). The potato variety Kufri Jawahar was planted during mid of November in both the seasons. To study the effect of intercropping on Early Blight disease of potato, six treatment combinations of intercropping were used viz. potato + onion (T₁), potato + garlic (T₂), potato + carrot (T₃), potato + marigold (T₄), potato + radish (T₅) and potato as sole crop (T₆). Plot size of each treatment combination was 5m × 2m and four replications were done.

In each treatment, disease incidence and per cent disease intensity was recorded at every seven days interval following the (0 – 5) scale (Anonymous, 1985).

Rating

0	Free from infection (no visible symptoms).
1	1 – 10% leaf area damaged.
2	10.1 – 20% leaf area damaged.
3	20.1 – 50% leaf area damaged.
4	50.1 – 75% leaf area damaged.
5	Above 75% leaf area damaged.

The per cent disease intensity (PDI) was calculated using the formula developed by McKinney

(1923).

The result of the experiment in respect of management of early blight of potato caused by *Alternaria solani* are presented in Table 1.

Different crops were planted as inter crop with potato to show their efficacy on reduction of the disease incidence and intensity. It is evident from the result presented in Table 1 and Fig. 1 & 2 that potato + marigold (T₄) combination exhibited best result in terms of per cent incidence (42.00%) and per cent disease intensity (8.82%) at 77 DAP over control where percent incidence and percent intensity of the disease was 71.50% and 21.95% respectively. Moreover per cent reduction of disease over control in this treatment was 41.25%. This was followed by potato + carrot combination (T₃), where 45.50% incidence and 10.17% per cent disease intensity were observed at 77 DAP. Per cent reduction of disease over control was 36.36%. Besides, potato + radish combination (33.03% reduction of disease) and potato + garlic combination (28.67% reduction of disease) was also recorded.

These findings are also in agreement with Gomez-

Rodriguez *et al.*, (2003) who reported allelopathic and microclimatic effect of intercropping of tomato with marigold on early blight. Intercropping with

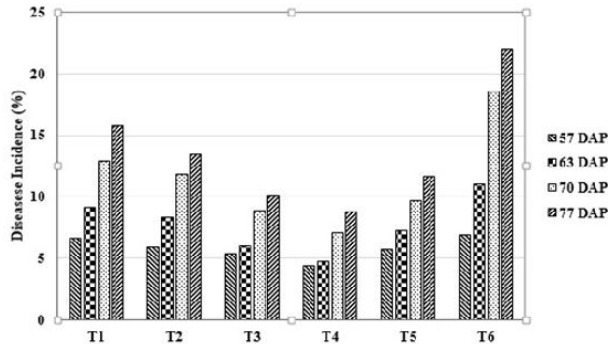


Fig. 1 : Effect of inter-cropping on disease incidence of early blight of potato field condition

marigold induced significant reduction in early blight of potato through allelopathic effect on conidia, alteration of microclimatic condition around the canopy and providing physical barrier against spread of conidia. All these mechanisms may be responsible for management of early blight of potato also.

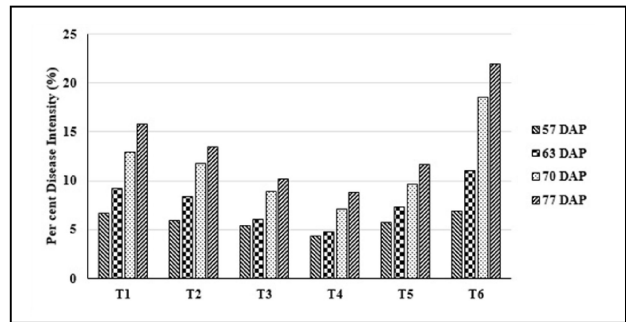


Fig. 2 : Effect of inter-cropping on per cent disease intensity of early blight of potato under field condition

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