

Effect of sowing time and management practices on incidence of stem gall and seed yield of coriander (*Coriandrum sativum* L.)

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Abstract

Coriander (*Coriandrum sativum* L.) is an important seed spice crop of India as well as of Rajasthan. In the recent years unfavourable climatic conditions owing to continuous rains during the cropping season, humid and cloudy weather congenial for widespread appearance of stem gall disease. For better management of stem gall disease cultural and management practices are very much important. In the present investigation effect of four sowing dates and four fungicidal treatments were assessed over cv. RCr-436 for stem gall disease incidence and management. It was found that for higher coriander seed yield, sowing should be done between 15th Oct to 15th Nov in Zone V of Rajasthan, however in late sown crop stem gall incidence is less. Moreover, foliar spray of 0.2% Hexaconazole fungicide at 45, 60 and 75 days after sowing is effective in disease management of stem gall disease.

Coriander (*Coriandrum sativum* L.) is an important seed spice crop of India as well as of Rajasthan State. In India, Rajasthan is the largest producer contributing 36 percent to the country's total production (Spice Board, 2017). In Rajasthan, humid south eastern plain zone (zone V) occupies not only the highest area but also contributes highest production in State, to the range of as high as 98 percent. In the recent year's unfavourable climatic conditions owing to continuous rains during the cropping season, humid and cloudy weather have created congenial environment for widespread appearance of stem gall disease in coriander causing severe yield loss. Stem gall disease is caused by fungus *Protomyces macrosporus* and has erupted as the most serious disease of coriander in the zone V affecting both yield and quality of the produce. As the name suggests, typical symptoms of disease appears in form of galls on stem portion near plant base initially which later spreads to the entire upper parts of the plant like flowers and seed. In its severe form, seed setting is drastically reduced or if seed are set they remains undersized or get transformed into long clove like structures. Several management practices including cultural and chemical methods have been suggested for integrated management of the disease by various researchers. Therefore, the present investigation was carried out to find out the best possible way for managing the disease to reduce the significant loss happening in the zone V. The experiment was conducted to assess the effect of date of sowing on stem gall disease occurrence and simultaneously application of fungicide to control the

disease incidence and spread.

The experiment was conducted at three locations viz., ARS, Kota, ATC, Nanta and KVK, Anta (Baran) during *rabi* 2015 - 16 with dominating variety of the zone RCr 436. At two locations i.e., ATC Nanta and KVK, Anta the crop was planted at four date of sowing (15th Oct, 30th Oct, 15th Nov and 30th Nov), whereas, at ARS, Kota two date of sowing were done (15th Nov and 30th Nov). Four management practices (Carbendazim 0.2%, Hexaconazole 0.2 %, Propiconazole 0.2 %, Tebuconazole 0.2 %) along with control were applied at ATC, Nanta and ARS, Kota. The observations were recorded on percent germination, percent disease index (PDI) and seed yield. Three foliar sprays of chemical fungicides were done at 45, 60 and 75 days after sowing. Stem gall disease incidence was recorded at only two locations i.e., ATC, Nanta and KVK, Anta. At ARS, Kota disease was not observed may be due to unfavourable conditions for disease development during crop growth.

In all the four dates of sowing, disease incidence was recorded at ATC Nanta (Table 1). The crop sown on 15th Oct at ATC Nanta had maximum PDI (19.53) which was at par with all the dates of sowing. However at KVK, Anta maximum disease incidence was recorded in 30th Oct sowing followed by 15th Oct sowing date, however in last date of sowing i.e., 30th Nov no disease incidence was recorded. With respect to seed yield at all the three locations; highest seed yield was obtained in the crop sown on 15th Nov at ARS, Kota which was disease free as no disease incidence was observed at ARS, Kota.

Whereas the crop was affected by disease incidence at rest of the two locations, in disease infected crop highest seed yield was observed at KVK, Anta in 30th Oct sown crop, followed by 15th Nov sown crop at ATC, Nanta. Lowest seed yield was observed in 30th November sowing at ARS, Kota and KVK, Anta while at ATC, Nanta, the lowest yield was observed at 15th October sowing. There was a progressive increase in yield at ATC, Nanta from 15th October to 15th November after which there was a decrease in yield. The increase in yield from 15th to 30th October sowing was also observed at KVK, Anta which showed a decline in yield at sowing on a later date. The best time of sowing of coriander was observed to be between 15th October to 15th November, which was in congruence with the recommendation included in the package of practices of zone V of Rajasthan. The effect of fungicide on disease control was also assessed at two locations, since at ARS Kota no disease incidence was recorded, the data of ATC, Nanta is presented in table 2. Under absolute control conditions 38.92 PDI was observed, whereas in fungicidal treatment minimum PDI was observed in hexaconazole 0.2 % (6.33 PDI) at par with propiconazole 0.2% (11.54 PDI). Similar Kumar *et*

al., (2014), found maximum seed yield with hexaconazole and propiconazole as foliar spray at 40, 60 and 75 days after sowing. Lakra (2000) studied the effect of date of sowing and fungicidal treatment on stem gall incidence, it was found that galling incidence was less in early and late sown crop and application of thiram as seed treatment reduced the incidence by 47.5 percent.

On the basis of the present study, it can be concluded that; in zone V Rajasthan, coriander yield high when sown between 30th October to 15th November. whereas stem gall incidence gradually reduced with delayed sowing. Moreover, foliar spray of 0.2% hexaconazole fungicide is effective in management of stem gall.

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References

Lakra, B. S. (2000). Management of stem gall of coriander (*Coriandrum sativum*) incited by *Protomyces macropsorus*. *Indian J. Agricultural Sciences*. 70 (5) 338-340

Table 1. Effect of date of sowing on stem gall incidence in coriander cv. RCr-436 under field conditions

	ATC, Nanta		KVK, Anta		ARS, Kota*
	PDI (%)	Seed yield (q ha ⁻¹)	PDI (%)	Seed yield (q ha ⁻¹)	Seed yield (q ha ⁻¹)
Date of sowing					
15 th October	19.53	7.79	21.66	6.66	-
30 th October	18.53	8.41	30.0	11.26	-
15th Novemeber	17.40	9.66	7.21	5.73	13.59
30 th November	15.07	8.96	0.00	1.33	8.89
CD (5%)	4.64	1.71	10.02	3.23	12.73

*No disease incidence was recorded under field conditions at ARS, Kota

Table 2. Effect of fungicide on stem gall incidence in coriander cv. RCr-436 under field conditions at ATC, Nanta

Management practices	ATC, Nanta	
	PDI (%)	Seed yield (kg ha ⁻¹)
Absolute control	38.92	6.08
Carbendazim 0.2%	15.92	7.96
Hexaconazole 0.2 %	6.33	11.18
Propiconazole 0.2 %	11.54	9.58
Tebuconazole 0.2 %	15.46	8.74
CD (5%)	7.19	1.50

*No disease incidence was recorded under field conditions at ARS, Kota

Kumar, G., Yadav, S. K., Patel, J. S., Sarkar, A. and Awasthi, L. P. (2014). Management of Stem Gall Disease in Coriander Using *Pseudomonas* and

Trichoderma (Bioagents) and Fungicides. *Journal of Pure and Applied Microbiology*. 8 (6) 1-4. Spice Board, 2017

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