

## THREAT OF CUSCUTA PARASITE IN CHILLI

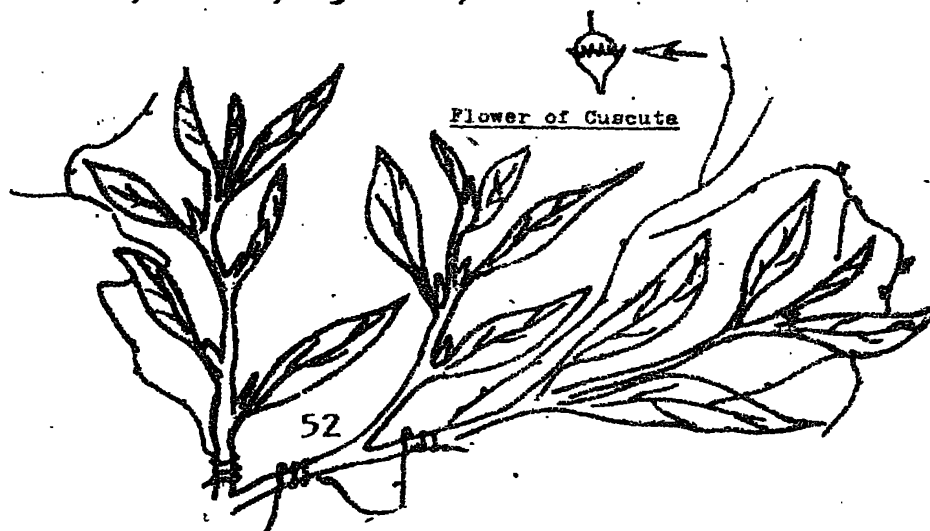
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Chilli (Capsicum annum L) is grown in many parts of the country; although the dry zone is the major growing area. Chilli crop may be seriously affected by diseases like leaf curl complex that cause substantial yield reduction. The other diseases like anthracnose, powdery mildew and wilt as well as damage from insect pests like aphids, pod borer, mites, thrips and white flies directly or indirectly affect the yield in chillies.

Very recently, a Cuscuta sp. (dodder in English, aga-mulaneti-wel in Sinhala and Kaskutta in Tamil), which is a total parasitic plant has been found attacking chilli in Minipe area, in the Kandy district. This parasite was observed on chilli plants grown in rice fields, under irrigation in Yala 1987 (dry season); however, the extent of attack was fairly small. The occurrence of Cuscuta sp. was reported earlier on a variety of hosts but often on Mikania (Dissanayake and Fosberg, 1980). Since the attack of this parasite is apparent on economic important crops like chilli, information on the development, spread and control of Cuscuta would be imperative.

### NATURE OF PARASITE AND EFFECT ON HOST.

Cuscuta is a flowering dicotyledenous plant belonging to the family Convolvulaceae. Many species of Cuscuta are known to parasitize on a variety of crops such as alfalfa, amaranths, cabbage, onion, flax, gourds, tomato etc. Two



species, Cuscuta chinensis Lam. and Cuscuta reflex Roxb. were reported to exist in Sri Lanka (Dissanayake and Fosberg, 1980).

The symptoms of attack of the Cuscuta sp. are very clear and typical in nature. Slender yellow vines are seen entwining the main stem and branches of chilli. At advance stages they cover the host plant completely. This could be visible even from a distance. The infected chilli plants get stunted, as their nutrients are depleted by the parasite. Host plants become weak, unhealthy and ultimately die, without any production.

### SPREAD AND PERPETUATION

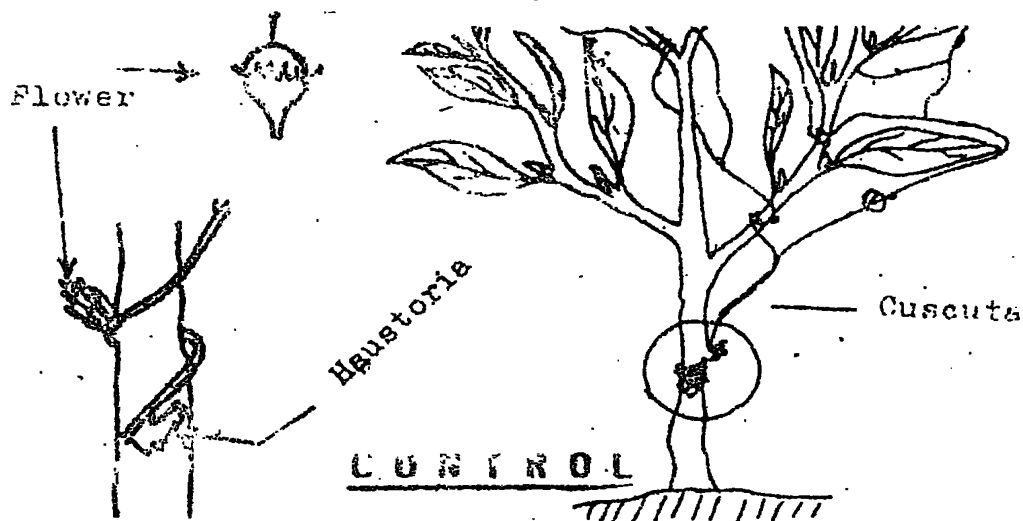
Primary attack and spread take place through seeds, which can overwinter in soil or carried as contaminants in the crop seed. The seeds remain viable for a long period. A single Cuscuta vine has the capacity to produce few thousand seeds. Further spreading could be possible through grazing animals, birds, farm implements, labourers and field workers and through irrigation water. Apart from chilli, Cuscuta also attacks majority of crop plants mentioned earlier. Non-crop plants like hedges and other road side trees are also attacked.

However, cereals, maize, soyabean and cowpea are reported to resist its attack. In the absence of host, it survives either in the soil or through parasitization and gets perpetuated for indefinite period.

### MODE OF ATTACK



The seeds of Cuscuta on germination give rise to young seedlings. They have a very weak root system and are in search of a host. As soon as they come in contact with a suitable host they parasitize it, sending minute haustoria or sucking roots into host tissue and extracting the nutrients. Haustoria seem to secrete diastase enzyme which hydrolyzes the host starch. Once established, the broken pieces of Cuscuta vine are capable of infecting another host plant, thus help in the spread of the parasite.



The following methods can be adopted to prevent the attack and spread of this parasite.

1. Use crop seeds completely free of Cuscuta seeds. These seeds are lighter and can be easily separated by dipping in water.
2. Burn Cuscuta vines before seed set.
3. Restrict the flow of irrigation water through the infested field.
4. Keep the irrigation channels free of hosts and parasites.
5. Avoid the use of Cuscuta infested farmyard manure.
6. Avoid animals grazing in the infested field.
7. Follow crop rotation with suitable resistant crops like maize, cowpea and soybean.
8. Destroy the crop plants and alternate host plants (non-crop plants), bearing Cuscuta infestation by burning.

#### ACKNOWLEDGEMENTS

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#### REFERENCES

Dissanayake, M.D. and F.R. Fosberg, (1980). Flora of Ceylon Vol.1. Amerind Publishing Co. Pvt. Ltd., New Delhi. 54

**TABLE 7. USE OF PESTICIDES IN PADDY CULTIVATION. ADOPTED PESTICIDES**

<u>K A N D Y</u>						
Pesticides	Percent Reporting 1/	Pest	Percent Reporting 2/	Average Quantity		% Farmers using the Pesticides the correct Pest.
				per farm	Quantity Per Ac.	
				Oz.		
Tameron	33	Leaf Roller	50	3.3	5.15	
		Leaf eating Caterpillar ]	19	4.0	8.0	
		Paddy bug	06	20.0	16.0	0
		Stem borer	06	4.0	4.0	
Corrector	31	Leaf Roller	-	-	-	
		Leaf eating Caterpillar	07	35.0	46.7	33
		Paddy bug	-	-	-	-
		Stem borer	13	34.9	69.3	-
Monocrotophos	16	Leaf Roller	38	6.3	4.2	50
		Leaf eating caterpillar	12	4.0	2.67	
		Paddy bug	-	-	-	
		Stem borer	25	11.3	19.43	
Monitor-500	10	Leaf Roller	40	3.0	458.	
		Leaf eating caterpillar	20	4.0	8.0	0
		Paddy bug	-	-	-	
		Stem borer	20	2.5	5.0	
Azodring-60	10	Leaf Roller	80	5.5	8.0	
		Leaf eating caterpillar	20	3.0	6.0	37
		Paddy bug	-	-	-	
		Stem borer	-	-	-	
<u>K E G A L L E</u>						
Monocrotophos	20	Leaf Roller	63	12.0	9.1	
		Paddy bug	-	-	-	
		B.P.H	18	20.0	40.0	71.0
		Gall Midge	-	-	-	
		Stem borer	-	-	-	
Tameron	16	Leaf Roller	78	11.1	9.9	
		Paddy bug	22	6.0	6.9	
		B.H.P.	11	38.0	13.3	0
		Gall Midge	-	-	-	
		Stem borer	11	8.0	8.0	
Corrector	11	Leaf Roller	67	48.0	403.2	
		Paddy bug	-	-	-	
		B.H.P.	17	35.2	140.8	12
		Gall Midge	17	70.4	70.4	
		Stem borer	-	-	-	
Parathion	11	Leaf Roller	83	7.2	10.3	
		Pad Bug	-	-	-	
		B.P.H.	33	4.0	8.0	0
		Gall Midge	-	-	-	
		Stem borer	-	-	-	
Lebaycid	07	Leaf Roller	50	8.0	10.7	
		Paddy bug	50	7.0	9.3	5
		B.P.H	-	-	-	
		Gall Midge	-	-	-	
		Stem borer	-	-	-	

USE OF PESTICIDES IN PADDY CULTIVATION.

THE CASES OF MAJOR PESTS AND WIDELY

ADMITTED PESTICIDES

MATALE

Pesticides	Percent Reporting <sup>1/</sup>	Pest	Percent Reporting <sup>2/</sup>	Average Quantity per Farm Oz.	Quantity Per Ac.	% Farmers using the Pesticide the correct Pest.
Lcbaycid	20	Stem borer	21	6.7	9.0	8
		Thrips	43	15.0	9.3	8
		Leaf Roller	14	4.0	6.4	
		Leaf eating caterpillar	07	2.0	4.0	
Monitor-600	16	Stem borer	18	12.0	9.0	
		Thrips	9.0	10.0	20.0	
		Leaf Roller	18	12.0	14.0	0
		Leaf eating caterpillar	36	7.0	5.4	
		Paddy bug	09	16.0	5.9	
Ecalux	12	Leaf eating caterpillar	86	6.0	8.5	
		Plant hopper	14	8.0	10.7	40
Nuwacron	09	Stem borer	17	22.0	3.2	
		Leaf Roller	67	6.0	7.8	32
Corrector	09	Stem borer	100	140.8	123.2	26
Tamaron	07	Stem borer	20	16.0	16.0	77.
		Leaf Roller	40	12.0	8.0	8.0
		Leaf eating caterpillar	20	8.0	16.0	
		Plant hopper	20	8.0	10.0	
Monocrotophos	04	Leaf Roller	50	16.0	16.0	
		Leaf eating caterpillar	50	16.0	16.0	14

1. As a percentage of the farmers reporting any pest problem.
2. As a percentage of the farmers reporting the respective pesticide.

apply chemicals. Observations on the near by fields also influenced the farmers in this decision process. Prior advice of extension officers as a decision criterion on insecticide use was found ineffective except for one third of the farmers in Matale. However, after the decision made to use insecticides, extension agents were consulted for information on the suitable types of insecticides, quantities and frequencies of application (Table 8).

Table: 8

ROOTS OF MOTIVATION FOR USING PESTICIDES

	KANDY	KEGALLE % Reporting	MAITALE	TOTAL SAMPLE
As a Preventive Measure	17.5	10.00	17.00	14.83
As a curative measure	58.7	80.00	75.00	71.23
Non reporting cases	23.8	-	-	7.93
<u>Reported reasons for resorting to Pesticides.</u>				
Pest problems in the farmers fields	52.3	70.0	67.27	63.19
Pest problems not in the farmers field but in adjoining fields.	12.7	5.0	9.09	8.93
Only as a preventive measure	6.3	1.67	3.63	3.87
Following the advice of officials	1.6	5.00	29.09	11.90
Following the example of the fellow farmers	4.8	10.00	14.55	9.78
Following use of pesticides of the other farmers	-	-	9.09	3.03
Others ...	1.0	8.30	5.45	4.58

this respect too, nevertheless past experience was the most powerful decision criterion, though this "past experience" could be originated by past extension activities, a substantial proportion of the farmers resorted to past experience in deciding the quantities of insecticides applied (Table 10). More than 25% of the farmers claimed their practice as quite adequate to control the insects even though it was shown earlier that farmers used only small quantities of chemicals. This is a matter for further investigation because this could happen as a result of the recommendations being too high or the "adequate level" the farmers refer to is lower than the level of control the research recommendations are geared to achieve. It is interesting to note that lack of finances had not been a limiting factor for pest control (Table 10).

### **Safe Handling of Insecticides:**

Avoiding spraying against the wind and refraining from directly touching the chemical were the safe handling practices followed by almost all the farmers. (Table 11). Long sleeved shirts were the only type of protective clothing reported by them. However, after spraying bathing or having a thorough body wash was practised by almost all farmers. One third of the farmers used to wash the spraying equipment in (unsafe) places such as public bathing places and natural water ways. However, an equal proportion was cautious enough to wash the sprayers and pour the waste water back into the paddy field before leaving it.

Storage of insecticides and disposal of the empty containers were done according to the standard "safe handling" instructions by nearly all the farmers (Table 12). They were well aware of the poisonous nature of the chemicals and no health hazards due to poisoning were reported (Table 13). None the less this refers only to the clearly visible immediate problems and farmers had no idea that continuous exposure to chemicals may create health problems. Majority of them had the impression that an insecticide applied to the field is effective only for 4 to 5 days.

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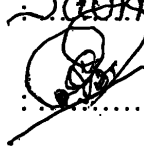
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