

Sweetpotato Whitefly Infection of Cotton Leaf Crumple From Weed Hosts in 1984.

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Summary

Cotton leaf crumple virus was detected in sweetpotato whiteflies collected from cheeseweed, field bindweed, globe-mallow, and prickly lettuce. Male and female whiteflies were equally viruliferous.

Cotton leaf crumple (CLC) is a disease of cotton incited by the CLC virus (CLCV), a gemini-like virus which is transmitted by the sweetpotato whitefly, Bemisia tabaci (Genn.). The CLCV infects plant species within the Malvaceae, Leguminosae, and Convolvulaceae. Thus there are numerous plant species which are endemic to southwestern U.S. cotton growing-areas which provide year-round virus reservoirs. During the spring and summer of 1984, individual sweetpotato whiteflies were collected from various weed and cultivated plant hosts at Tempe, AZ to determine whether the virus could be detected in the whitefly vector in a field situation.

The presence or absence of the CLCV in adult B. tabaci was based upon the ability of the whiteflies to transmit the virus to greenhouse-grown CLC-free cotton plants. Test plants were considered infected if typical CLC symptoms developed 3-4 weeks post-inoculation. Sweetpotato whitefly adults were collected from potential CLCV hosts and non-hosts using a vacuum collector. Plant species from which whiteflies were collected included cheeseweed, Malva parviflora L., field bindweed, Convolvulus arvensis L., globe-mallow, Sphaeralcea coulteri (Wats.), prickly lettuce, Lactuca serriola L., sweet potato, Ipomea batatas (L.) Lam., and from commercially grown cotton, Gossypium hirsutum L. Greenhouse maintained CLCV-infected stub cotton plants were used as positive controls. Individual whiteflies were allowed a 24 hr inoculation-access feeding period while placed in 140 cc plastic cages on the first or second true leaves of 'Stoneville 61' cotton seedling indicators. Whiteflies were removed and the cotton indicator plants were held in a whitefly-free greenhouse for 3-4 weeks before they were examined for the presence of CLC symptoms.

CLCV was detected in individual viruliferous whitefly adults collected from different field hosts and in positive controls (Table 1). The low number of viruliferous adults detected when positive controls were the source plants (52% in March and 13% in April), leads us to believe that seasonal variation (particularly from April to June) in the symptomatology of CLCV-infected indicators interfered with the ability to detect viruliferous adults by bioassay. As yet unidentified greenhouse conditions may have masked the

typical symptoms expected in CLCV-infected indicators. Brown and Nelson (in review) reported CLCV transmission 100% of the time when 10 B. tabaci adults/plant were used and 60% transmission when single adults were used. The lack of efficiency of transmission, therefore, does not explain adequately the discrepancies. CLC symptoms eventually developed in some of the inoculated test plants after they were stubbed and allowed 4-8 weeks for regrowth, so the hypothesis that symptoms may be masked seasonally is most likely.

Despite the apparent underestimation of viruliferous B. tabaci levels using bioassay, the CLCV was detected in whiteflies collected from field-grown cheeseweed, field bindweed, globe-mallow, and prickly lettuce. Virus was not detected in whiteflies collected from commercial cotton fields, but B. tabaci from sweetpotato plants growing adjacent to known CLCV-infected cotton were viruliferous.

In an additional but preliminary study, male and female whiteflies collected from greenhouse-grown CLCV-infected positive control plants were about equally viruliferous and comparable to those collected from CLCV-infected cotton plants in the field (Table 2).

Reference Cited

Brown, J. K., and M. R. Nelson. Host range and vector relationships of cotton leaf crumple virus. Phytopathology (in review).

Table 1. Percent of CLC Infection of B. tabaci Collected From Different Hosts During Different Months. Tempe, AZ 1984.

Month	Host	Positive	Negative	%+
February	cheeseweed	3	23	12
March	cheeseweed	4	24	14
	field bindweed	4	20	17
	globe-mallow	2	12	14
	stub cotton (gnhs)	11	10	52
	prickly lettuce	2	2	50
April	cheeseweed	0	6	0
	cotton (gnhs)	6	41	13
	field bindweed	5	101	5
	prickly lettuce	0	4	0
May	cheeseweed	1	5	17
	cotton (commercial)	0	65	0
	field bindweed	1	108	1
June	cotton (commercial)	0	48	0
August	field bindweed	11	44	20
	sweet potato	5	3	62

**Table 2. Percent of Male and Female B. tabaci Collected on CLC
Infected Cotton Plants in the Greenhouse and Field, 1984.**

<u>Months</u>	<u>Males</u>			<u>Females</u>		
	Positive	Negative	%+	Positive	Negative	%+
April-July gnhs.	11	108	12%	25	124	17%
August field	10	16	38%	18	36	33%
