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RELATIONSHIP OF LEAF CURL VIRUS AND ROOT-KNOT NEMATODE INCIDENCE IN SOME TOMATO HYBRIDS

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In the field multiple infection by several kinds of pathogens may contribute to yield losses in vegetable crops. Investigations of combined infections have generally lagged behind because of some inherent difficulties in such studies. Interrelationships between viruses and nematodes have been restricted mainly to the transmission of viruses. Root-knot nematodes have not been reported as virus vectors but recently it has been shown that they may cause greater damage to plants when in combination with some viruses (Ryder and Crittenden, 1962; Swaroop and Goswami, 1969; Paul Khurana *et al.*, 1970). Also, Bustillo (1972) has shown that cowpea chlorotic mottle virus concentration was increased 15-73% in soybean plants infested with *Rotylenchulus reniformis*.

In trials with tomato hybrids we commonly observed that abnormally several symptoms of leaf curl virus were always associated with high incidence of root-knot nematodes (*Meloidogyne* spp.). Assessments of the incidence of leaf curl virus in relation to that of root-knot nematodes are given in Table I.

Each tomato hybrid was sown in three replicates, each of 27 plants. Virus infection was assessed as severe ($^{+++}$) (Table I) when leaves were stunted, curled and severely puckered, and mild ($^{+}$) when only mild symptoms occurred in a few leaves. The root-knot index was calculated according to Taylor (1970).

All the hybrids and parents tested were susceptible to leaf curl virus but the severity of infection varied greatly both between parents and between hybrids (Table I). Severe virus infection was in

all cases related to a high incidence of root-knot nematode infestation and resulted in loss of yield. Nematex showed a high level of resistance to root-knot and to virus infection and hybrids with Nematex as a parent also showed a similar level of resistance (Table I). Differences in yield between Nematex, Nematex × Nova, and Nematex × Angurlata corresponded with the respective levels of virus infection.

Table I - *Leaf curl virus and root-knot nematode incidence in some tomato hybrids.*

Hybrids	Percent Virus Infected Plants	Symptom Severity	Root-knot Index	Average Yield / plant (kg) (1)
Ilalihin x Angurlata	80	+++	3.9	0.95
Ilalihin x Nova	40	+	1.6	1.16
Ilalihin	90	+++	3.5	0.88
S-12 x Angurlata	60	+++	4.0	2.00
S-12 x Nova	50	+++	4.3	2.20
S-12	75	+++	4.1	1.87
Nematex x Angurlata	10	+	1.3	3.50
Nematex x Nova	25	+	1.1	2.13
Nematex	40	+	1.0	1.24
Pusa Ruby x Angurlata	75	+++	4.0	1.99
Pusa Ruby x Nova	80	+++	4.1	1.18
Pusa Ruby	80	+++	3.7	0.83

\+ = mild symptom on a few leaves
+++ = severe damage
(1) Graded from 1 (immune) through 3 (slightly susceptible) to 5 (highly susceptible).

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Accepted for publication on 30 October 1974.