

Tomato Ringspot Virus Reduces Dandelion Top Weight and Flower Production under Field Conditions

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Tomato ringspot virus (TmRSV) infection is associated with disease in many fruit crops. In Pennsylvania and surrounding states, the most economically important TmRSV-induced disease is prunus stem pitting (PSP) of peach [*Prunus persica* (L.) Batsch.]. Common dandelion (*Taraxicum officinale* Weber) is of potential epidemiological importance to the PSP disease. This perennial weed is widely distributed throughout the northern United States, has a high population density in many orchards, and is frequently infected with TmRSV (Powell et al., 1984a, 1984b). Infected dandelions serve as donor plants for TmRSV transmission by *Xiphinema rivesi*, the dagger nematode, and can transmit TmRSV to progeny via seed (Mountain et al., 1983). We investigated the effect of TmRSV on common dandelion survivability, flower production, and fresh weight under field conditions to better assess its role in the PSP disease.

In April, a 20 × 20 m field plot was plowed, disked, and fumigated with MC-2 (98% methylbromide, 2% chloropicrin), which reduced the nematode populations to a nondetectable level when measured by wet-sieving with Baermann funnel extraction. Two TmRSV-infected dandelion seedlings and two uninfected seedlings from each of four seed sources (derived from different orchards) were

randomly transplanted into the fumigated plot within each of eight 9-m² blocks (16 plants per block). The dandelions were spaced in a 4 × 4 lattice; each dandelion was separated from its nearest neighbor by 60 cm. The eight blocks were also randomized; four were mowed (as would be done in an orchard drive row) and four were not mowed.

At the end of 2 years, the number of flowers on surviving plants was counted; then the plants were harvested and the fresh weights of tops (above the crown-root junction) were determined. At the conclusion of the experiment, the surviving dandelions were assayed for TmRSV. Plants that were initially infected were still infected, and those that

were initially uninfected remained free of TmRSV.

According to our data, there are different dandelion genotypes (dandelion is apomictic) in nature with varying responses to TmRSV, as exemplified by the interaction of seed source × virus (Table 1). There also was a significant interaction between mowing and TmRSV infection for flower production ($P = 0.017$) and fresh weight ($P = 0.0028$), indicating that TmRSV affects dandelion plants that are mowed regularly more adversely than those not mowed. Seventy-three percent of all plants survived (produced new growth) 2 years after planting, irrespective of mowing, seed source, or virus main effects. This experiment clearly shows that TmRSV reduced fresh weight and flower production of common dandelion and that the pathogenic effects probably vary with seed source.

Literature Cited

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Table 1. Field vigor of dandelion as influenced by mowing, seed source, and tomato ringspot virus infection, as determined after 2 years of growth.

Variable	Mean flower production (no.)		Mean fresh wt (g)	
	+ TmRSV	- TmRSV	+ TmRSV	- TmRSV
Mowed	41	101	49	87
Not mowed	53	113	73	129
Seed source 1	43	99	35	62
2	51	118	53	94
3	45	101	82	145
4	48	108	74	131
Variable	Significance		Significance	
Mowing (M)	*		**	
Seed source (S)	NS		*	
Virus (V)	**		**	
M × S	NS		NS	
M × V	*		*	
S × V	*		*	
M × S × V	NS		NS	

NS,*,**Nonsignificant or significant at $P = 0.05$ or 0.01 , respectively.

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