

UPDATE ON BIOTYPES OF SAA IN WESTERN UNITED STATES

Mervin W. Nielson
 Research Entomologist
 Science and Education Administration, USDA

Biotypes of the spotted alfalfa aphid have been present in western United States for over 20 years. The historical development of these biotypes is shown on Table 1. About 4 years after the aphid was introduced into the United States in 1954, the first indication of virulent populations on resistant alfalfa was reported on 3 clones of Moapa at the Imperial Valley Field Station (Pesho, Lieberman and Lehman, 1960). This population was designated biotype ENT-A to separate it from the originally introduced population designated biotype ENT-B.

Table 1. Historical Development of Virulent Biotypes of SAA on Alfalfa.

<u>Year</u>	<u>Alfalfa Biotype</u>	<u>Origin</u>	<u>Variety Host</u>
1953	B	Middle East	Chilean
1958	A	El Centro, CA	Moapa
1968	F	El Centro, CA	Moapa
1970	H	Mesa, Arizona	Mesa-Sirsa
1978	I	Fresno, CA	Seed Fields
1978	(?)	Australia	Hunter River

About 10 years after ENT-A was discovered, a new and more virulent population was found at the Imperial Valley Field Station. This biotype designated as ENT-F was causing severe damage to Moapa alfalfa and was so virulent that 5 of the 9 clones of Moapa were susceptible (Nielson et al., 1970).

In Arizona another new and highly virulent biotype was found on Mesa-Sirsa alfalfa in Parker and Mesa, Arizona. This population was designated biotype H after it was found that all but 2 clones of Moapa were susceptible (Nielson and Don, 1974). The response of the clones of Moapa to these biotypes is shown in Table 2.

Table 2. Response of Moapa Clones to Biotypes of SAA.

<u>Clones</u>	<u>Biotypes</u>				
	<u>B</u>	<u>A</u>	<u>F</u>	<u>H</u>	<u>I</u>
C-903	R	S	S	S	-
-904	R	R			R
-905	R	R	S	S	R
-906	R	R	R	S	R
-907	R	R	R	S	R
-908	R	S	S	S	R
-909	R	R	I		R
-910	R	R	I	S	R
-911	R	S	S	S	S

R = Resistant, I = Intermediate, S = Susceptible

Three virulent biotypes that have caused concern on resistant varieties during the past 20 years have been restricted to 3 localities; El Centro, CA, Parker AZ and Mesa, AZ. Spread of these biotypes has been very slow or nonexistent, and population outbreaks have been rare since the biotypes were first discovered. Containment of these populations may have been due in part to development of new varieties that are highly resistant to the virulent biotypes. Moreover, many resistant varieties of varied

germplasm have been released for commercial production which act as a "polyculture" that discourages the development and spread of virulent strains of the aphid. Regardless of the degree of SAA resistance in alfalfa and number of resistant varieties available, the aphid will continue to change and produce virulent populations for many years to come.

Recently a population outbreak of the SAA occurred in seed fields at the Boswell Ranch in Kings County near Fresno, CA. Tests on the clones of Moapa showed that the population was similar to biotype C, a nonvirulent strain which does not reproduce on any of the Moapa clones (Table 3). Other studies are being done to determine if the California population is virulent on alfalfa clones that are not related to Moapa germplasm. The results of these studies will be reported later.

Table 3. Mean Reproduction of Biotypes on Moapa Clones.

Biotype	Mean Reproduction	
Westside Field Station	0.5	a
Boswell #1	1.0	a
C	1.2	a
Boswell #2	1.5	a
Boswell #3	2.6	a
F	28.8	b
H	78.1	c

L.S.D. 24.68

An interesting corollary to the SAA biotype problem in the United States has occurred in Australia where the insect was introduced in 1977. A tentative report indicates that the SAA in Australia may be a virulent biotype after recent tests showed that all clones of Moapa were susceptible to this population.

References Cited:

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