

Major Species of Aphids and Their Seasonal Occurrence on Soybean in Chikugo

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Two species of aphids, *Aulacorthum solani* and *Aphis gossypii* were observed as predominant species from May to June on soybean plants sown as a summer crop in April, 1980. The former was more abundant than the latter. Another species, *Aphis glycines* was more abundant than the other two species mentioned above from mid-August to early September on the fall crop sown in July, but among these species *A. solani* showed the highest population density in October.

As an aphid on soybean in the Chugoku, Shikoku, and Kyushu districts, *Aphis glycines* has been cited,^{1,2,3,6} but this species has not been a serious threat. On the other hand, in northern Japan, the occurrence of several species of aphids is mentioned as well as that of *Aphis glycines*, but it was recorded that their populations were not large.^{4,5,7}

The author observed the species that migrated to summer crop soybeans in 1980, while researching their propagation on summer crop soybean and fall crop soybean. Mainly *Aulacorthum solani* was observed propagating on summer crop soybeans, and even on fall crop soybeans the propagation of this species was conspicuous after mid-October. This is only one year's research result, but it is reported for future reference.

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Subjects and Methods

Summer crop soybean plants (variety: "Kogane") were sown April 17th on a c.2-acre farm at our experiment station and fall crop soybean plants (variety: "Akiyoshi") were sown July 22nd on a c.3-acre farm both at our experiment station and on a c.12-acre rice paddy converted farm (in the first year of turnover) in Chikugo. Also, fall crop soybean plants (variety: "Akisengoku) on another farm in Amagi were researched.

The subjects of our research with summer crop soybean plants were 50

previously selected plants (three beans sown together). That is, we collected all the aphids, winged and wingless, from these plants with insect suction tubes, and then in the lab we kept count of aphids of each species. Alongside of this, we randomly sampled 20 stalks right from the soil of the farm and deposited all the aphids we found on them into a glass pot in the lab. With the fall crop, we followed a nearly identical procedure.

Results

As is shown on Table 1 and 2, *Aphis glycines* was not found on the summer crop soybean plants, but the high occurrence of *Aulacorthum solani* was observed. Also, *Aphis gossypii* was found, though its population density was not high. Among the others, a species called *Myzus persicae* was observed, but MISSING.

Table 1
Species and Numbers of Aphids from 50 Summer Crop Soybean(1980)

Dates of Collection	Aulacorthum solani		Aphis gossypii		Aphis glycines		Others	
	Winged	Wingless	Winged	Wingless	Winged	Wingless	Winged	Wingless
	May 12	61	19	(11)	2	0	0	5
14-15	42	115	(54)	30	0	0	27	1
17	32	17	(17)	1	0	0	12	0
19-20	96	263	(77)	5	0	0	25	1
22-23	35	37	(15)	0	0	0	7	0
24-31	51	135	(59)	2	0	0	44	0
June 3-5	9	35	(1)	1	(1)	0	6	0
9-10	4	37	0	2	0	0	3	0
13	0	0	0	0	0	0	0	0
16-17	0	5	0	0	0	0	0	0
19	0	5	0	0	0	0	0	0

Notes; 1) Collections were done with suction tubes from the haired stalks and leaves.

2) Numbers in parentheses may include similar species.

3) Concerning "others," the wingless and half of the winged were *Myzus persicae*.

Conclusions

As mentioned above, in the case of 1980, most of the aphids, *Aphis glycines*, on soybean plants in Chikugo were winged, just as previously reported.

As for the fall crop soybean plants, from the middle of August to the beginning of September, mostly *Aphis glycines* was found, but from the middle to the end of October, the density of *Aulacorthum solani* increased and surpassed that of *Aphis glycines* (Table 3). Then, in the middle of October, the density of aphids, especially *Aulacorthum solani*, reached about 200 a stalk, and such plants with high density of

aphids noticeably have leaves with yellow or brown spots, and tended to shed their leaves earlier as a result (Table 4).

Rather than the occurrence of MISSING, throughout the seasons, the occurrence of *Aulacorthum solani* was high. Whether the majority of the aphids on soybean plants in Chikugo are *Aulacorthum solani* every year is not known without further research. However, the research the author conducted on *Aulacorthum solani* on potato plants in Nagasaki eight consecutive years since 1972 shows that there was not a year from the end of April to the beginning of May and from the middle to the end of October when we did not find *Aulacorthum solani* (unpublished). Since the climate of Chikugo is not so different from that of Nagasaki, the occurrence of *Aulacorthum solani* around May and October found in this research is not surprising. The occurrence of this species about these times of year is likely to happen hereafter.

Also, as is found in this research, the high occurrence of aphids on fall crop soybean plants gives damage to their leaves and can affect the crop, so it cannot be overlooked.

Articles Cited

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Table 2

Species of Aphids and Population Density of 20 Summer Crop Soybean Stalks (1980)

Date	<i>Aulacorthum solani</i>		<i>Aphis gossypii</i>		Others	
	Winged	Wingless	Winged	Wingless	Winged	Wingless
May 27	3	36	(3)	1	0	0
June 3	1	7	(1)	0	0	0
10	0	12	0	0	0	0
17	0	14	0	0	0	0

Notes 1) Aphids were collected from stalks right above the soil with a brush.

2) Numbers in parentheses may include similar species.

Table 3
Species of Aphids Collected from Fall Crop Soybean Plants (1980)

	Aulacorthum solani		Aphis gossypii		Aphis glycines		Others
	Winged	Wingless	Winged	Wingless	Winged	Wingless	Winged Wingless
Aug 2 Station farm:							
Suction from 55 stalks	0	0	0	0	0	0	0
0 0							
14-15 Station farm:							
Suction from 55 stalks	1	2	(5)	0	11	110	
7 0							
25 Station farm:							
Suction from 55 stalks	0	2	(2)	1	4	46	
0 0							
Sep 1 Rice paddy-converted farm:							
removed from 10 stalks		<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>4</u>	
<u>36</u> <u>0</u> <u>0</u>							
Oct 16 Rice paddy-converted farm:							
removed from 10 stalks		214		0		32	
0							
27 Station farm:							
removed from 20 stalks		4	185	0	0	0	
20 0 2							
30 Amagi farm:							
removed from 20 stalks		1	114	0	0	6	
84 3 14							

Note: Numbers in parentheses may include similar species.

Table 4
Aphid Population Density and Leaf Count of Fall Crop Soybean Plants
In Areas Sprayed with Insecticide and Those Without (1980)

<u>Leaves/Stalk</u>	Sites	<u>Numbers of Aphids/Stalk</u>				<u>Numbers of</u>
		Sep 1	Sep 8	Oct 16	Oct 22	Oct 22
Areas sprayed with MEP twice	/	0	25	/	/	
areas sprayed with MEP thrice	/	/	/	1	41	
Areas sprayed with EPN twice	/	0	16	/	/	
Areas with methomyl twice	/	1	3	/	/	

Areas without insecticide 143 18 203 200 28

Notes: 1) Aphid population density is found by removing aphids from (5-20) stalks cut right above the soil.

2) Numbers of leaves are of 10-20 stalks when differences occurred between those in areas sprayed with insecticide and those in areas without.

3) Insecticide was sprayed on Sep 2, Sep 17, and Sep 30.