Correlation Between the Vector Densities and the Rate of Potato Virus Infections (I)

Number of Flying Aphid Vectors of Potato Viruses in West Coast, Inland and Alpine Areas.

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Certified seed potatoes are delivered to farmers in most countries. However, unfortunately this has not been practiced in this country.

The reason for this is that, unlike in other seed potato producing countries, the fields for seed potatoes of individual farmers are extremely small in size in the Alpine areas.

Consequently, the amount of sample seed potatoes to be tested is too large to test for virus infection using the tuber indexing method, the classic method, but an expensive and time consuming one. This method, of course, is desirable in this country; however, the facilities at the Alpine Experiment Station are not adequate to carry it out.

Consequently, other practical methods are needed for the seed potatoes for use by Korean farmers, not for those for export. As a substitute for this classic method, the author is testing the correlation between the vector densities and the rate of potato virus infections.

In this report, only the results of the flying aphid survey are included. The results of field tests at 18 locations will be published in 1670 after the examination of virus infection.

The traps were opperated from May to June at the 18 locations together with 2 other locations where the traps have been opperated from 1967 to compare the aphid populations to those at different localities.

The results are shown in Table 1.

Abbreviations: Ko.: Kochon, Ki.: Kimpo, Ha.: Haseong, Ya.: Yangchon, Wo.: Wolgok, So.: Sosa, Kw.: Kwangju, Yu.: Yuseong, Ir.: Iri, Su.: Suwon, F.: College Farm, O.: College Orchard, A.: Agr. Exp. Station, T.: Taegwanryong.

A total of some 70 species of aphids were caught, including 4 species of Potato Virus Vectors. The Vectors are as follows:

Aphis gossypii GLOVER

Aulacorthum solani (KALTENBACH)

Lipaphis erysimi (KALTENBACH)

Myzus persicae (SULZER)

By this by-product, the author is convinced again that the system of seed potato production should be changed. The shortcomings of the present so-called high-land system have already been discussed in previous papers. (1)(2)

In Table 1, the means of Total vectors versus Total aphids in the West coast, Inland and Alpine areas were 8/61, 179/680 and 50/237, respectively.

During the potato growing period the number of vectors (50) in the Alpine area will increase, because the growing period in the Alpine area is from May to August, whereas in the West Coast area the potatoes are harvested in June before the transplanting of rice seedlings.

Considering the results obtained in this experiment together with the results in 1967 and 1968, the author stresses again that the propagation of seed potatoes on the rice paddies on the western coast has many advantages over the present, high-land system.

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Literature cited

1. Paik, W.H. (1968): Preliminary Survey of Flying Aphids in the Coastal Areas. Korean Observer, Sept. 1968 p. 38-48.
2. Paik, W.H. (1969): Population Density of Potato Virus Vectors in the Kwanghwal Area, Kimje-gun, Chollapukto, on the Western Coast. Plant Protection 7 p. 5-13.

적 요

매개진딧물 밀도와 감자바이러스 이병율간의 상관관계 (1)

—서해안 내륙 및 고령지에 있어서의 감자바이러스 매개진딧물의 밀도—

백 운 하

거의 모든 국가에서 생산된 씨감자는 감자바이러스 이병율을 검사해서 합격품만을 농민에 분배하고 있다. 우리나라는 딴 씨감자 생산국과는 사정이 달라 고령지에서 씨감자를 생산하고 있는 관계로 감자밭의 필수(筆數)는 전국적으로 막대한 수에 달한다.

우리 나라에서의 감자바이러스 검정은 원원종에 한하고 있으나 농민에 분배되는 씨감자도 바이러스 검정을 해서 합격품만을 나누어 주어야 국가의 체면이 스겠다.

그러나 현재의 시설로는 이를 감당 할 수 없어 이에 대치 될 만한 실제적 방법의 하나로 매개진딧물 밀도와 감자바이러스 이병율간의 상관관계를 밝혀 번잡한 바이러스 검정법 대신 매개진딧물의 공중밀도를 조사하여 해지점의 감자바이러스 이병율을 추산 할 목적으로 본 시험에 착수하였다.

본보고에서는 진딧물조사 결과만을 발표하고 18개소에서 행한 포장시험결과는 1970년에 행할 바이러스 검정을 마치면 종합결과를 발표 할 예정이다.

표 1에서와 같이 서해안, 내륙, 및 대관령에서의 매개진딧물과 일반진딧물의 수는 각각 8/31, 179/680 및 50/237이었으며 필자가 행한 1967, 1968년의 조사성적을 뒷받침하는 결과를 얻었다.

이에 필자는 씨감자 부족량 약 60,000톤의 조속한 충족을 위해 씨감자의 증식 단계에서는 서해안 일모작답을 활용 할 것을 다시한번 강조하는 바이다.

Flying Aphid Vectors of Potato Viruses at Western Coast, Inlands and Alpine Areas.

(The names and numbers of catches of the vectors are printed in Gothic)

May-June, 1969.

Aphids \ Location	Western Coast (Kimpo Area)											Inlands								Alpine Area	Total
	Ko. A	Ko. B	Ko. C	Ki. A	Ki. B	Ha. A	Ha. B	Ya. A	Ya. B	Wo. A	Wo. B	So.	Kw.	Yu.	Ir.	Su.	Su. F.	Su. O.	Su. A.	T.	
Anoecia fulviabdominalis	1	1	4									4	4	4	3	4		39	9		73
Aphis sp.			2	1										2	6	4	44	6	2	1	68
Aphis craccivora		1	2						1	1	6	13	12	69	50	102	449	2	20		728
Aphis crinosa n.n.																1	1	4			6
Aphis gossypii	8	7	4	4	9	12		3			1	14	13	52	14	32	44	20	4	48	292
Aphis sambuci horii														3		2	2				7
Aphis ichigo						1						1		1			3	4	4	6	20
Aphis nerii										2							1			2	5
Aphis spiraecola					2	1	1	8		2		16	19	34	51	40	49	4	47	6	280
Aphis rumicis	12	9	77	2	4	3		1	1		4	101	91	5	56	72	312	28	46	5	829
Aulacorthum sp.															1	1					2
Aulacorthum solani											3	6	2	14	11	13	43	3	8		103
Brachycaudus helichrysi															2						2
Brachyunguis sp.																	1				1
Brevicoryne brassicae													23	1	2		1				27
Capitophorus elaeagni				2				2													4
Capitophorus hippophaes			1	2		1	5	3	2		2	29	9	47	20	14	95	9	41		280
Caviriella sp.		1										5	1	1			1				9
Cavariella salicicola													4		13	3	10	2	3		35
Cervaphis quercus												6		100		123	36	99			364
Chaitophorus populeti coreanus					1			1		1				4		8	14		1		30
Chaitophorus versicolor																	5				5
Cinara sp.																	1				1
Coloradoa rufomaculata														4			2		1		7
Cryptosiphum artemisiae					1									3		1	2	1	4		12
Dactynotus sp.																	1				1
Eulachnus thunbergi																	1				1
Greenidea nipponica													13	11		3	4	2			33
Hayhurstia atriplicis														1	1		3				5
Hyalopterus pruni																	1				1
Hyperomyzus carduellinus													3		5		1				9
Kallistaphis coreanus n. sp.																		1			1
Kurisakia onigurumi																1					1

Macrosiphum ibarae			6				1		1		1	3	3	11	17	44	8	8	5	108
Macrosiphum sp.	1	1	2		1	1	4		5	9	5	8	18	6	29	33	13	9	3	148
Myzus persicae																1				1
Myzus sp.	3	2	14	2	3		1	4		6	121	176	271	159	21	309	14	35	2	1,143
Periphyllus californiensis									1											1
Pemphigus sp.						1					1				3	1				6
Pleotrichophorus chrysanthemi		1																		1
Myzus sakurae													17	3	12	70	2	2		106
Recticallis nigrostriata													2	1		1				4
Rhopalosiphum maidis																	1			1
Rhopalosiphoninus sp.	4	4	11		7	2	3	3	2	3	4	6	11	3	4	12		2	159	240
Rhopalosiphum padi																2				2
Sarucallis kahawaluokalani							1					11	1	4		1				18
Schizaphis sp.													1							1
Semiaphis heraclei																1				1
Sorbaphis sp.																1				1
Tinocallis zelkowae												1	5							6
Toxoptera citricidus											7		1		14	9	4			35
Toxoptera odinae															21	203	4			228
Trichosiphoniella sakurae															7			1		8
Trichosiphoniella sp.											1		1		384	6	86	2		480
Tuberculatus stigmata															1			1		2
Tuberculoides sp.												1	1	1	1	30	3			37
Tuberculoides hirtipes n. sp.																2	1			3
Tuberolachnus salignus																	1			1
Dactynotus gobonis																1				1
Eriosomatid			1								2	5	4	2	13	30		3		60
Tetraneura sp.	4	3										4	1	2	3	6		2	2	27
Amphicercidus japonicus														1	1					2
Xenomyzus ishimikawae															44		1			45
Others														2						2
														3		4	8			15
Total Vectors / Total Aphids	11/33	9/30	23/129	4/11	12/28	12/22	0/6	4/28	4/11	0/15	10/34	141/337	191/409	339/696	197/446	68/1,007	411/1,914	37/371	47/257	50/237	1,570/6,021
Mean	8/31											179/680								50/237	79/301