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RESISTANCE OF THE POTATO TO LATENT MOSAIC

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Resistance studies have shown that certain varieties are immune from latent mosaic; others rarely contract infection from field exposure but become infected in tuber and shoot grafting; whereas still others are masked carriers of this disease (1), (2).

This paper presents information on the reaction to latent mosaic

of potato seedling varieties from two crosses, S 41956 X Katahdin and S 41956 X S 45075.

Latent mosaic comprises a potato virus group involving virus types distinguishable by differences in virulence or severity of reaction on potato, tobacco and Jimson weed. Furthermore, it has been shown (3), that potatoes inoculated with different types of latent mosaic in combination with a virus of another group, such as mild mosaic, manifest different mosaic symptoms. Moreover, potatoes harboring the latent mosaic virus are subject to more severe reactions if they contract other viruses. Although latent mosaic virus alone may induce slight, or no apparently pathological reactions on certain varieties, it may cause severe reactions in composite infections.

The seedling variety 41956, a progeny from the cross G.S. 9-1 X S 24642, was first found to be immune from latent mosaic in tuber grafting with potatoes infected with rugose mosaic (latent, veinbanding) and mild mosaic viruses. In these grafts this seedling variety contracted only the veinbanding virus, and the mild mosaic component free from the latent virus. In many stalk and tuber grafts and sap inoculations with latent mosaic it has failed to become infected as was disclosed by sub-inoculations to *Datura stramonium* and *Capsicum* sp., which readily contract latent mosaic from sap inoculations (1).

Raleigh (4) found that scions of a Green Mountain seedling containing the latent mosaic virus developed aerial tubers, and dwarfed shoots when grafted on stocks of 41956. Tubers failed to form on the latter. The development was normal, however, in grafts where Green Mountain seedling scions, free from latent virus, and stocks of 41956 were used.

This aerial tuber reaction provides a method for detecting immunity of the potato from latent mosaic. This method, and using *Datura stramonium* and *Capsicum* sp. as index hosts, was employed in determining the reactions of the seedlings as recorded in table I.

TABLE I.—Reaction of potato seedling varieties to latent mosaic in stem grafts to latent mosaic Green Mountain

Parentage	Seedling Varieties Total Number	Reaction of Seedling Varieties			
		Immune	Necrotic	Mottled	Latent
		Per cent	Per cent	Per cent	Per cent
S 41956 X Katahdin.	203	37	23	16	24
S 41956 & S 45075...	135	37		36	27
Katahdin control	6		100		
S 45075 control	4			25	75
S 41956 control	10	100			

The results recorded in table 1 were obtained by inarch grafting of a shoot from each of three tubers of a seedling variety on a latent mosaic Green Mountain shoot when the plants were about 15 cm. high. Approximately 10 days after grafting, the seedling shoots in two of the grafts were cut off above and adjacent to the graft union, whereas the Green Mountain shoots were cut off below the graft union so as to leave a latent mosaic top on the seedling variety stock. The seedling shoots in the third graft were not severed so that the foliage reactions could be observed. Four weeks after inarching, seedling plants were recorded as immune, (where aerial tubers formed on Green Mountain shoots); necrotic, mottled or light green foliage; and latent, (with no apparent symptoms). Sap inoculations were made from apparently healthy seedling plants on *Datura stramonium* and *Capsicum* sp. to determine whether such seedlings were symptomless carriers of the virus. The final observations were made at harvest time, eight weeks after inarching, when some of the grafted shoots that failed to manifest symptoms at the previous inspection, were found to show reactions.

Inarched grafts of Katahdin, and of the seedling varieties 41956 and 45075, the parents used in the two crosses, were made on latent mosaic Green Mountain to serve as controls. The results showed that all the Katahdin shoots developed top-necrosis. One shoot of 45075 developed light green foliage, whereas three remained apparently healthy, but inoculations from these last shoots to *Datura stramonium* showed that these plants harbored latent mosaic. The seedling variety 41956 was immune, as was indicated by the aerial tuber reaction in the latent mosaic Green Mountain scion.

As recorded in table 1, the seedling variety progenies reacted as follows: Of the 203 from S 41956 X Katahdin 37 per cent were immune; 23 per cent necrotic; 16 per cent mottled with light green foliage; and 24 per cent were apparently healthy. Of the 135 seedling varieties from S 41956 X S 45075, 37 per cent were immune from latent mosaic; none developed necrosis; 36 per cent manifested mottled and light green foliage; and 27 per cent appeared healthy. Sap inoculations from the apparently healthy progenies in the two crosses on *Datura stramonium* and *Capsicum* sp. showed that the apparently healthy plants harbored latent mosaic.

Thirty-seven per cent of the progeny of both crosses showed immunity from latent mosaic (table 1). Twenty-three per cent of the progeny of S 41956 X Katahdin developed the same top necrosis reaction to the disease as is typical of the Katahdin parent. No necrosis developed in the progeny of S 41956 X S 45075, which indicates that

the S 45075 parent is genetically different from Katahdin for this type of reaction.

Although the data at hand are not sufficient to permit a complete genetic analysis of the various reactions, the results show that immunity from latent mosaic of the parent S 41956 was transmitted to a high percentage of the progeny of the two crosses.

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SECTIONAL NOTES

ALABAMA

Alabama has planted the largest acreage in its history. One hundred and fifty-nine cars of seed potatoes were planted in 1936, and approximately three hundred cars have been planted for the 1937 crop. The acreage, therefore, in South Alabama will be approximately double that of last year and about 50 per cent increase over a long period average. The crop is in excellent shape, and the general attitude of the growers is optimistic. (April 8).—L. M. Ware.

CALIFORNIA

We conducted a private survey of the Kern County potato district, listing each grower by acreage. The sum total of this estimate showed that in Kern County 22,500 acres of potatoes were planted. A small additional acreage will be planted after this estimate was made.

The California Department of Agriculture is estimating the acreage for this district at 20,100. However, we believe that a final check-up will prove that the acreage is nearer 23,000. In the Edison district, which is included in the above totals, there are 3,600 acres. Part of this acreage was planted very early and will start producing in a small way about April 15. However, the real production in Kern County will not