The 1989 Bean Common Mosaic Virus Epidemic in Idaho

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During 1989, bean common mosaic virus (BCMV) symptoms were observed in dry bean cultivars resistant to strains of the virus commonly found in Idaho. Of 28,000 A of foundation, registered, and certified seed classes inspected by Idaho Crop Improvement Association, 2.4% was rejected for excessive BCMV. Of this, 42% was pinto UI 114. In addition, all University of Idaho foundation seed acreage grown at Caldwell was rejected or downgraded due to excessive levels of BCMV.

Cultivars that exhibited mosaic mottle symptoms are shown in Table 1. Strains in serotype A and/or B groups were detected by ELISA (table 2). NL-8 from UI 114 was detected although pathogroup III-like strains have previously been detected in Idaho, Washington (2), Michigan (1), and New York (3). Data suggest that a serotype A strain of the virus was seedborne in UI 114, at least since 1987, and a serotype B strain has been seedborne in UI 60 since 1982. Testing of old seedlots is underway to determine how long the serotype A strain has been in UI 114 seed.

An anomalous situation was encountered in which mosaic mottle symptoms were observed in the *I* gene cultivars Kardinal and C-20. Tissue samples of Kardinal tested positive to potyvirus and broad spectrum BCMV monoclonal antibodies (MCA), but negative to serotype A and B MCA's (table 2). Harvested seedlots of these cultivars tested negative to all MCA's. Little incidence of black root was observed in the fields of Kardinal and C-20 at Caldwell, and in general, incidence of black root was only slightly higher than what is observed in most years. The results for the Kardinal and C-20 suggest the possibility that bean yellow mosaic virus (BYMV) may have caused symptoms, as reported in Michigan (Mbewe, Kelly and Saettler; this issue).

A serotype A positive isolate from UI 114 inoculated onto a set of differential hosts was identified as NL-8. Research is under way to further characterize this and other BCMV isolates from the 1989 epidemic.

1. Kelly, J.D., A.W. Saettler, M. Morales. 1983. New necrotic strain of bean common mosaic virus in Michigan. BIC 26:49-50

2. Hampton, R.O., M.J. Silbernagel, D.W. Burke. 1983. Bean common mosaic virus strains associated with bean mosaic epidemics in the Northwestern United States. Plant Disease 67:658-661.

3. Provvidenti, R., M.J. Silbernagel, W.-Y. Wang. 1984. Local epidemic of NL-8 strain of bean common mosaic virus in bean fields of western New York. Plant Disease 68:1092-1094.

Table 1. Dry bean cultivars with mosaic mottle symptoms of BCMV in seed fields and breeding nursery plots in Idaho in 1989.

Cultivar	Market Class	Susceptible to one or more pathogroups I & Va[1]?
Mich. Impr.	cranberry	yes
Steuben	yellow eye	yes
Kardinal	LR kidney	no
UI 60	great northern	no
Upland	navy	yes
Agri-1	navy	no?

Cultivar	Market Class	Susceptible to one or more pathogroups I & Va[1]?
Bonus	navy	yes
Sanilac	navy	yes
C-20	navy	no
Roza	pink	no
Sutter	pink	yes
Viva	pink	no
UI 111	pinto	yes
UI 114	pinto	no
UI 126	pinto	no
Othello	pinto	no
NW 410	pinto	no
Sierra	pinto	yes

[1]Drijhout. 1978. Agric. Res. Rep. 872. Agric. Publ. and Doc., Wageningen, The Netherlands. I=type; Va=NY 15 strains.

Table 2. Results of ELISA tests for BCMV in dry bean cultivars in the UI foundation seed program and yield trial nurseries.

			Antisera			
Cultivar	Year[1]	Tissue	Poty-1[2]	BCMV-1[3]	MCAB-I2[4]	MCAB-II134[5]
Sutter	1988	Seed	nt[6]	+	+	nt
UI 114	1989	Leaf	+	+	+	-
	1988	Seed	+	+	+	-
	1987	Seed	+	+	+	-
NW 410	1989	Leaf	+	+	+	+
	1988	Seed	-	-	-	-
	1987	Seed	-	-	-	-
UI 126	1989	Leaf	+	+	-	+
	1988	Seed	-	-	-	-
	1987	Seed	-	-	-	-
Othello	1989	Leaf	+	+	+	-
	1988	Seed	-	-	-	-
	1987	Seed	-	-	-	-
UI 60	1989	Leaf	+	+	+	+
	1982	Seed	+	+	-	+
Kardinal	1989	Leaf	+	+	-	-
	1988	Seed	-	-	-	-
C-20	1987	Seed	-	-	-	-

[1]Year of production of the seedlot. [2]Detects most potyviruses. [3]Detects all known BCMV isolates, and some BYMV isolates. [4]Detects the four known serotype A isolates. [5]Detects many, but not all of the serotype B isolates. [6]Not tested.