thirty cowpea lines sprayed with 400 ppm ethephon and peduncle abscission of the same lines exposed to thrips were 0.67** and 0.51**, in two separate experiments. Timing of the ethephon spray is critical because peduncles and buds have a short period of sensitivity. Before the peduncle starts to elongate, and after peduncles are 3 to 5 cm long, they are much less sensitive to applied ethephon. Spraying under Ibadan conditions must commence about a month after planting, 7-10 days before flowering starts. Varietal differences in susceptibility to abscission-causing disorders or pests in other legumes could perhaps also be identified using ethephon sprays.

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ENZYME-LINKED IMMUNOSORBENT ASSAY (ELISA) FOR DETECTION OF BEAN COMMON MOSAIC VIRUS

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Twelve out of approximately 100 entries in the International Bean Rust Nursery expressed symptoms typical of bean common mosaic virus (BCMV) in plants grown for rust tests in the greenhouse. These 12 plus 7 other entries showing no symptoms were selected for assaying for BCMV using two methods, namely, the enzyme-linked immunosorbent assay (ELISA) and a local lesion host, Monroe LL.

The ELISA test was performed as outlined by Clark and Adams (J. Gen. Virol. 1977, 34:475-483) with some modification. A few leaves of each sample were ground in buffer (phosphate buffered saline+0.05% Tween 20) and the sap was applied to ELISA plates which had been sensitized for 1 hr with antibody specific for BCMV. The plates were incubated for 3 hrs at 37 C and rinsed with buffer three times. Alkaline phosphatase conjugated specific antibody was added and the plates were incubated for 1 hr. The plates were again rinsed three times with buffer and phosphatase substrate was added. The reaction was allowed to proceed at room temperature for 1 hr and then stopped by the addition of 3M NaOH. Intensity of the yellow colored product was measured spectrophotometrically.

For the local lesion assay, crude sap was applied to primary leaves of Monroe LL plants. Local lesion counts were made 10 days following inoculation.

A comparison of the results of the two tests is seen in the table below.

ELISA readings were in complete agreement with local lesion (LL) tests. The two tests also were in nearly perfect agreement with the presence or absence of symptoms. An ELISA (absorbance) reading of twice that of the uninfected control (0.17) is considered negative. Entries with ELISA readings of 0.34 or less were negative in the LL test and plants did not show symptoms. Conversely, entries with ELISA readings of 0.35 or more were positive in the LL test and plants showed symptoms. An exception was Entry 20 where the two tests were positive, but symptoms absent. However, presence of virus particles typical of BCMV confirmed the plant to be infected with virus.

Entry	ELISA[1/]	LL[2/]	Symptoms
4	1.05	9	mild mosaic
6	1.75	100	severe leaf curl, mosaic
12	0.52	27	mild mosaic
15	0.66	50	mild mosaic
16	0.57	17	leaf curl
17	0.24	0	none
20	0.42	3	none[3/]
24	0.81	37	vein banding
28	0.23	0	none
29	0.97	72	leaf curl, mosaic
32	0.30	0	none
41	0.69	24	severe leaf curl, mosaic
71	0.69	9	leaf curl, mosaic
72	0.59	25	leaf curl, mosaic
87	0.19	0	none
94	0.74	7	mild mosaic
112	0.17	0	none
125	0.46	83	severe leaf curl, mosaic
+control[4/]	1.35	100	severe leaf curl, mosaic
-control[5/]	0.17	0	none

1/ Average of two samples reading absorbance at 405nm

2/ Number of local lesions on primary leaves of three Monroe LL plants

3/ Virus particles typical of BCMV present

4/ Plants inoculated with BCMV

5/ Plants not inoculated with BCMV

The magnitude of the ELISA reading was not necessarily correlated with number of LL produced or with severity of symptoms. The lack of this quantitative relationship may have been due to the presence in specific entries of strains that reacted differently to the specific BCMV antibody used. It also could have been due to variability among plants of Monroe LL in their capacity to produce local lesions in response to the virus.

This preliminary, unreplicated test indicates that ELISA may be a quick and accurate method of assaying bean plants for presence of BCMV. As such, it may be adapted to screening germ plasm collections for presence of seedborne BCMV so that only BCMV-free plants be propagated and maintained in the collection. It could also be used to distinguish between BCMV infected and non-infected plants in the field in virus surveys or assessing breeding populations for resistance.

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SOURCES OF RESISTANCE TO U. S. BEAN RUST - UPDATE

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In the BIC Annual Report (Volume 20:82-83, 1977) I reported on the reaction of beans to U. S. rust populations in field and greenhouse tests and listed those lines and cultivars that were resistant. Most of the beans reported as resistant were entries in the International Bean Rust Nursery. This nursery of 132 entries, was designated the IBRN-1975-76, and was grown in Maryland and Michigan in 1975, 1976, and 1977, and in North Dakota in 1975.

In 1978, a second nursery of 118 entries, designated by Dr. Howard Schwartz of CIAT as IBRN-77, was grown in Maryland and Michigan (Dr. Fred Saettler, cooperating). Seventy of the entries in the IBRN 1975-1976 nursery were continued in the IBRN-1977 nursery.

Entries of both of these nurseries were inoculated with four collections of rust in the greenhouse at Beltsville in 1977 and 1978. The four collections were selected from approximately 30 received from several geographic areas of the U. S. and represent a broad range of pathogenicity. One collection in particular, collected by Dr. A. L. Andersen in Michigan on the Sanilac cultivar, attacked many entries resistant to the other three collections. This collection is distinguished from the other collections by its ability to attack Aurora, a cultivar known to have at least three genes for rust resistance. In 1977, another Aurora-attacking collection was made in New Jersey from Pinto U. I. 111. This type of pathogenicity may be widespread.

Combining the results of field tests in Maryland, Michigan and North Dakota and the results of greenhouse inoculations at Beltsville with the four collections of rust, the following entries have been identified as: