Longevity of Tobacco Ringspot Virus in Soybean Seed

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ABSTRACT

Soybean seed, cultivar Harosoy, harvested from tobacco ringspot virus-infected plants (TRSV), was stored at room temperature in the laboratory and at 1-2 C in a cold room. Germination of seed stored in the laboratory was reduced after 24 months and declined sharply after 42 months. Germination of seed stored in the cold room remained unchanged for 60 months as did the percentage of seed infected with TRSV under both storage conditions. The possibility of disseminating the virus in infected seed is mentioned. Phytopathology 61:755.

Additional key words: Glycine max, soybean disease, bud blight.

Seed transmission of TRSV (tobacco ringspot virus) in soybean (*Glycine max* [L] Merr.) was first reported by DesJardins et al. (3). Athow & Bancroft (1) found that over half the plants grown from infected seed produced 100% infected seed. They showed that the virus was associated with the embryonic tissue of the seed, but not the seedcoat, and treatment with Na_3PO_4 did not reduce the amount of seed transmission. They also reported that the virus remained infectious in the seed for at least 9 months under ordinary storage conditions. Athow & Laviolette (2) presented data on the relation of seed-transmitted TRSV to soybean yield which indicated that seed transmission was of little importance except in perpetuating or disseminating the virus. Since seed transmission may result in short or long range dissemination of TRSV, the longevity of the virus in the seed is of some interest.

Seed of the cultivar Harosoy was harvested from infected plants grown from infected seed. The seed was divided into two lots. One lot was stored in a laboratory where the temperature fluctuated from 16-32 C but usually was in the range of 20-24 C. The other lot was placed in a seed storage chamber with a temperature of 1-2 C and approx 30% relative humidity. At 6-month intervals, 400 seeds of each lot were planted in sand in the greenhouse at 24-26 C. Infected seedlings were readily identified. Germination and infection were recorded when the first trifoliolate leaf was fully expanded (Table 1).

TABLE 1. Percentage germination (G) and tobacco ringspot virus (TRSV) in soybean seed stored 0-60 months in a cold room and at room temperature

Months after harvest	% Germination and TRSV infection			
	Cold room (1-2 C)		Room temp	
	G	TRSV	G	TRSV
0	—	—	85	86
6	91	85	81	87
12	89	87	79	85
18	93	87	85	86
24	95	84	87	86
30	94	87	76	86
36	96	89	65	86
42	92	89	62	87
48	93	84	43	77
54	86	82	35	81
60	91	78	8	77

Immediately after harvest, the seed germinated 85%, and 86% of the seed was infected. The germination of the seed kept in cold storage never dropped below this value in 60 months, nor was there any appreciable change in the percentage of TRSV-infected seedlings. The germination of the seed stored in the laboratory was reduced after 24 months, and declined greatly after 42 months. The percentage of TRSV infection remained almost constant in this seed throughout the 5-year period, and on a percentage basis was essentially equal to the infection in the seed in cold storage.

Soybean seed for commercial planting is rarely saved more than 2 years because of reduced germination and vigor. However, seed for experimental planting is frequently older. The introduction of TRSV with this seed is a distinct possibility which should be recognized.

LITERATURE CITED

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