

CERCOSPORA SOJINA:
PATHOGENICITY, NEW RACES
AND SEED TRANSMISSION IN SOYBEANS

Jose Tadashi Yorinori, Ph.D.
University of Illinois at Urbana-Champaign, 1981

Reprinted from
DISSERTATION ABSTRACTS INTERNATIONAL

Volume 42, Number 2, 1981

CERCOSPORA SOJINA: PATHOGENICITY, NEW RACES AND SEED TRANSMISSION IN SOYBEANS Order No. 8114505

YORINORI, JOSE TADASHI, PH.D. *University of Illinois at Urbana-Champaign*, 1981. 181pp.

The variability in *Cercospora sojina* (frog-eye leaf spot of soybeans), seed transmission and its relationship with other seedborne organisms were investigated.

Sixty-six cultivars (maturity groups 00 to IX) were inoculated in the field with race 2 and nine new isolates of *C. sojina* at 5 to 7 days intervals. The first inoculation was done when cultivars of maturity group 00 started to flower and defoliation was scored on day 33 from first inoculation.

Two disease rating scales were defined. (1) Based on relative number and types of lesions: 0 = no lesion; 1 = reddish brown spots, 0.5 mm diameter or up to five 3 to 5 mm diameter spots/trifoliolate leaf; 2 = reddish brown spots, 1 to 2 mm diameter or five to 10 spots/trifoliolate, 3 to 5 mm diameter; 3 = spots with reddish brown margin, light-brown to grayish center, 2 to 3 mm diameter or 10 to 50 spots/trifoliolate, 3 to 5 mm diameter; 4 = spots with thin reddish brown margin, dark-grayish to light-brown center, 3 to 5 mm diameter and 50 to 120 spots/trifoliolate; and 5 = same as 4 with spots of more than 4 mm diameter and more than 120 spots/trifoliolate. (2) Based on percentage defoliation: 0 to 5% = resistant, 6 to 9% = intermediate, and more than 10% = susceptible. The nine new isolates of *C. sojina* were identified as seven new races and designated races 5 to 11.

A set of differential cultivars with Bienville, Blackhawk, Bragg, Capital, Comet, Davis, Dorman, Flambeau, Hampton, Hood, Lee, Mandarin (Ottawa), Patoka, Roanoke, Tanner and Wabash is suggested.

Percentage seed infection by *C. sojina* (Cs) and other organisms on 29 cultivars (maturity groups 00 to IV) were determined in either of two ways. For the pod harvest (a) 16 cultivars (groups 00 to II) had all the pods from five plants collected separately and the seeds aseptically assayed on blotters (4 layers of filter papers in 9-cm culture plates) with 15 to 17 seeds/plate; and for threshed seeds (b) 13 cultivars (groups III and IV) had five plants threshed together and five samples of 60 seeds/cultivar were assayed on blotters at 15 seeds/plate. The two harvest methods were also compared with seeds threshed and surface-disinfected with 0.5% NaClO.

Percentage defoliation varied from less than 1 to 80% and was positively correlated with Cs and negatively with *C. kikuchii* infection (Ck), purple-stained seeds at plating (PS) and with 100-seed weight (HSW). The mean Cs varied from 0 to 91.6% and was negatively correlated with Ck and HSW. Cs was most responsible for reduction in HSW. The effect of *C. sojina* on germination (GER) and HSW depended on infection occurring before full seed development. Mean PS varied from 1.7 to 15.6% and mean Ck varied from 7.7 to 47.1%. Mean *Phomopsis* spp. infection (Ph) varied from 5.2 to 80% and was the most responsible for low GER. Mean SMV seed mottling varied from 0 to 41.8%. SMV was higher on late-maturity cultivars, whereas, Ck, Cs and Ph were lower.

Recovery of Ck, Cs and Ph from threshed and surface-disinfected seeds were significantly lower than from seeds removed from pods. The rate of seed transmission can be underestimated when seeds are surface-disinfected.