

Evaluation of resistance or tolerance of sugar snap pea varieties and breeding lines to pod lesions, 2001.

A field trial was planted May 9 at the Hancock Agricultural Research Station to evaluate expression of pod lesions on eight sugar snap pea varieties and breeding lines. The pod lesions are small raised areas with a necrotic tip that severely decrease pod quality of sugar snap peas. Seeds were planted using a V-belt hand planter at approximately 6 seeds per foot and each plot consisted of four 12-foot-long rows planted 16 inches apart. The experimental design was a randomized complete block with four replications. Soil type was Plainfield loamy sand with pH 6.0. Fertilizer consisted of 0-0-61 broadcast at 250 lb/A on April 16, prior to planting. Basagran, 1.5 pt/A + Poast Plus, 1.5 pt/A + Crop Oil, 1.0 pt/A was applied June 8 for weed control. The field trial was conducted in a field that does not have a history of pea production and adjacent fields were not planted to peas. No chemical treatment was applied to the plants to attempt to limit development of pod symptoms. The cultivars and breeding lines were divided into two groups – those that matured in 62-70 days and those with a 70-day maturity period. Pods from each variety were rated at two different times on the basis of the maturity of the developing pods. On each evaluation date, 50 mature pods were picked randomly from the center rows of each plot. Pods were divided into severity classes according to the number of lesions seen on one side of each pod: 0 = no lesions; 1 = 1 lesion; 2 = 2-5 lesions; 3 = 6-10 lesions; 4 = 11-20 lesions; 5 = > 20 lesions. Rainfall recorded for this field during the growing season (inches) was May 9-31 (3.33), June (4.1); July (2.73); August (4.57) and September (4.59). An additional 5.04 inches of water was applied as overhead sprinkler irrigation in nine applications (June 26 – July 16).

The severity of disease and the number of lesions per pod were consistently highest for the first rating date. The cultivar most susceptible to this problem appeared to be Sugar Prince. This cultivar exhibited the greatest severity of symptoms as well as the highest number of lesions per pod. Two cultivars, Crystal – an afila type and Jessy – a conventional plant type, exhibited the lowest disease severity and number of lesions per pod on both of the rating dates. It appears that selection of lines of peas with reduced susceptibility to the pod blemish condition may be possible. Further evaluation of breeding lines and additional cultivars is recommended. Breeding for resistance to this disorder is more likely to produce tangible results than chemical control.

Table 1. Evaluation of pod symptoms on different pea varieties.

Cultivar or line	Leaf Type	Maturity	Source	Rating Date		Disease Severity ^{1,2}		Avg. lesions/pod ^{1,3}	
				First	Second	First rating	Second rating	First rating	Second rating
Sugar Prince	Normal	68 days	Syngenta	Jul 10	Jul 16	46.1	32.9	6.0	3.4
Sugar Sprint	Normal	62 days	Syngenta	Jul 10	Jul 16	21.8	19.3	2.0	2.0
SP 704-3-4-3	Afila	64 days	Syngenta	Jul 10	Jul 16	21.0	14.6	1.8	1.3
SP 496-1-2-3 (Sugar Lace II)	Afila	70 days	Syngenta	Jul 10	Jul 16	30.8	20.6	3.3	2.1
SL173	Normal	70 days	Syngenta	Jul 16	Jul 20	21.7	11.4	2.1	1.0
Crystal	Afila	70 days	C.M.	Jul 16	Jul 20	15.3	12.5	1.4	1.3
Jessy	Normal	70 days	Brotherto n	Jul 16	Jul 20	12.0	5.8	1.1	0.5
EX 08590485	Normal	66 days	Asgrow	Jul 16	Jul 20	22.2	10.0	2.4	0.9
Pr > F ⁴						< 0.01	< 0.01	< 0.01	< 0.01
LSD ⁴						5.9	7.4	0.9	0.9

1. 50 mature pods were harvested from each plot. Pods were divided into severity classes according to number of lesions seen on one side of each pod: 0 – no lesions; 1 – 1 lesion; 2 – 2-5 lesions; 3 – 6-10 lesions; 4 – 11-20 lesions; 5 > 20 lesions.

2. Severity was calculated by summing the number in each class times the class number x 100 / 5 times the total number of pods rated. The maximum value for this index (if all pods were rated 5) is 100.
3. Average number of lesions/pod was calculated by summing the number in each class times the mean number of lesions for that class / total number of pods rated. Mean lesions/class used in this calculation were: class 1 – 1, class 2 (2-5 lesions) – 3.5, class 3 (6-10 lesions) – 8, class 4 (11-20 lesions) – 15.5, class 5 (> 20 lesions) 21.
4. Analysis of variance was performed on data, and Fisher's protected least significant difference (LSD) was calculated. NS = not significant at $P = 0.10$. * = Differences between treatments were significant at $P = 0.10$, but not at $P = 0.05$.

