J Indian Bot Soc 68 (1989)

Some Aspects of Seed Health of Powdery Mildew - Infected *Pisum sativum*

N.K. Shastree & M.K. Pandey

Department of Botany, Magadh University, Bodh-Gaya-824 234.

Department of Botany, S.P. Jain College, Sasaram (Rohtas).

(Accepted January 1988)

The powdery mildew disease is considered as a limiting factor in pea production. Mildew infected seeds displayed the following characters: a change in colour (greyish brown), change in texture (mostly wrinkled), dimensional loss to the extent of 11%, weight loss at 12%, loss in volume at 19% and infestation of powdery mildews inoculum on the seed-coat to the extent of 23%.

Key Words - Powdery mildew inoculum texture seed-coat

Distributed throughout the world, the powdery mildews cause serious losses to a wide variety of crops. The disease has been considered as a limiting factor in pea production (Spencer, 1978). The disease is seed-borne in nature (Crawford, 1927). In this communication, some aspects of seed health, i.e. colour, shape, texture, average size, weight, volume and percentage of seeds having mildew infestation are presented.

MATERIALS & METHODS Ten populations were studied. Colour, shape and texture were determined by visual observations. Size, volume and weight of seeds were determined according to Misra (1968). Screening of seeds for isolations of powdery mildews infestation on the seed-coat was done by blotter method (ISTA, 1966).

RESULTS & DISCUSSIONS Seven parameters were used to study ten populations of healthy as well as diseased plants. Healthy seeds were greyish green in colour while the diseased seeds became greyish brown. Healthy seeds were of spherical shape while the diseased ones were slightly flattened except in two samples, that retained spherical shape. About 60% of healthy seeds were smooth walled and 40% were wrinkled, while 60% of diseased seeds were wrinkled and remaining 40% were wrinkled shared by smooth-walled and smooth dimpled ones at equal level. Size of healthy seeds varied from 1.8 to 3.5 mm. with an average of 2.6 mm.,while the diseased seeds were of 1.5 to 2.8 mm. diameter, with an average of 3mm. The weight of healthy seeds varied from 249 to 227 mg, with an average of 238 mg; while the same for diseased ones was in the range of 206 to 215 mg, with an average value of 209 mg. Healthy seeds occupied an average volume of 0.82 cu. cc. while the diseased ones occupied 0.66 cu. cc. The healthy seeds were almost free from powdery mildew infestation on the seed-coat except for four samples, while the inoculum was 23% on the diseased seedcoats.

Change of colour of seeds to greyish brown is an important sign of disease involvement (Chupp & Sherf, 1960) and the disease damages at seed-level and Van Hook (1906) and Stevens (1921) reported seed infection to the extent of 23%. Loss of weight at the level of seed is from 6% (Lawes & Hayes, 1965) to 25% (Munjal, 1963).

Table - 1 Qualitative and Quantitative Seed Health Characters of Healthy and Diseased *Pisum sativum*.

Parameter	Seeds from healthy Population										Seeds from diseased population									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
Colour	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gg	Gb	Gb	Gb	Gb	Gb	Gb	Gb	Gb	Gb	Gb
Shape	Sp	Sp	Sp	Sp	Sp	Sp	Sp	Sp	Sp	Sp	Sf	Sf	Sp	Sf	Sf	Sp	Sf	Sf	Sf	Sf
Texture	Sm	Sm	Wr	Sm	Wr	Wr	Sm	Sm	Wr	Sm	Wr	Wr	Sm	Wr	Wr	Sm	Wr	Wr	Sd	Sd
Av.Size(mm)	3.5	2.8	2.3	3.4	1.8	1.9	1.9	2.5	2.7	2.7	2.8	2.2	1.8	2.7	1.5	1.7	2.4	2.6	2.5	2.4
Av.wt.(mg)	231	236	241	227	228	243	249	246	240	241	207	210	215	210	212	202	208	206	208	211
Av.vol.(Cu.cc)	0.753	0.756	0.854	0.875	0.976	0.864	0.832	0.783	0.763	0.756	0.597	0.598	0.625	0.635	0.698	0.696	0.697	0.697	0.697	0.698
Percentage infestation	–	–	2	1	–	–	–	1	1	–	23	25	26	20	25	22	22	22	20	

Sp-Spherical, Sm - Smooth walled, Sd-Smooth dimpled, Sf-Slightly flattened, Wr-Wrinkled, Gg-Greyish green, Gb - Greyish brown.

REFERENCES

CHUPP C & A F SHERF 1960 Vegetable diseases and their control, Ronald, New York.

CRAWFORD R F 1927 Powdery mildew of peas, *New Mexico Agr Exp Stn Bull* **163** 1-13.

INTERNATIONAL SEED TESTING ASSOCIATION 1966 *Proc Int Seed Test Ass* **32** 1-152.

LAWES D A & J D HAYES 1965 Effect of powdery mildew on seeds, *Plant Pathology* **14** 125-128.

MISRA R 1968 Ecology work book, Oxford & IBH New Delhi pp 83-91.

MUNJAL R L, V V CHENULU & T S HORA 1963 Assessement of losses due to powdery mildew (*Erysiphe polygoni* DC) **on pea,** *Indian Phytopathology* **16** 268-70.

SPENCER D M 1978 The powdery mildews, Academic Press, London.

STEVENS F L & J G HULL 1921 Diseases of economic plants, **McGraw Hill, New York,** 213pp.

VANHOOK J M 1906 Powdery mildews of the pea, *Ohio Agri Expt Stn Bull* **173** 231-249.