Annals of the Sri Lanka Department of Agriculture, 2002. 4: 432

RESEARCH NEWS

EFFECT OF SOLAR HEATING ON BRUCHID (COLEOPTERA: BRUCHIDAE) INFESTATION AND SEED VIABILITY IN PIGEONPEA

K.N.C. GUNEWARDENA
Field Crops Research and Development Institute, Mahailluppallama

Bruchids (*Callosobruchus* spp.), are a major storage pest of pigeonpea and several other grain legumes. Seeds can be protected by storing with insecticides which are toxic to the consumers. The effect of solar heating on bruchid damage was investigated using seeds of pigeonpea (10% moisture level), variety MPG 537 adopting two factor-factorial, Completely Randomized Design with three replications. Pigeonpea seeds were packed in two types of bags *i.e.* transparent polythene bags (28 × 25 cm size, 300 gauge) and polysack bags (35 × 25 cm). Each bag had 3 kg of seeds. Five pairs of newly emerged (0-24 h old) bruchids were introduced into each bag and the bags were sealed. The bags were exposed to direct sunlight for 2, 5 and 7-d. The period of exposure to direct sunlight in each day was 6 h (10 a.m. - 4 p.m.). Three samples of seeds were kept inside a room without exposing to direct sunlight (control). These bags were stored in the laboratory for 6 months. The percentages of seeds damaged by bruchids and seed germination were recorded.

Effect of solar heating on bruchid infestation

The maximum temperature inside the polythene bag was about 55^0 C while it was 45° C inside the polysack bags. The temperature in the bags kept in the laboratory (28-31° C) as compared to the solar heated polythene and polysack bags. Seeds stored inside polythene bags were comparatively less damaged by bruchids than those of polysack bags. Seeds solar heated up to 5-7-d in polythene bags effectively controlled bruchid damage in pigeonpea seeds and had only 3-6% damage after 6 months of storage. Seeds in polysack bags solar heated to the same periods had low percentage damage (3-11%) only up to 12 weeks of storage and the damage after 6 months of storage was over 25%. The seeds in polythene and polysack bags without solar heating had up to 48% and 59% bruchid damage during the same period respectively. Two days solar heating was not adequate to have a significant reduction of the bruchid damage. In this experiment, solar heating has increased the daily temperature inside the polythene bags up to 55°C and this was adequate to keep the bruchid damage below 6% up to 6 months of storage.

Effect of solar heating on seed germination

Before solarization, pigeonpea seeds had 90-97% germination and it was reduced to 60-68% during the 6 months storage period. However, no significant difference was observed in the germination percentages of solar heated and non-heated seeds. Even though the seeds were damaged by bruchids, most of those seeds germinated. This may be the reason for not observing significant difference among the treatments which had different percentages of bruchid damage. Hence, not only the percentage of germinability but determining the seedling vigour is also important. Therefore, solar heating can be considered as a safe and effective method for storing pigeonpea seeds.