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Short Note

Assessment of rodent damage in wheat under mid hill conditions of Himachal Pradesh

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Wheat is an important cereal crop grown in *rabi* season under mid and low hills of Himachal Pradesh, but the ravage of pests and diseases conflict heavy losses to the crop. Amongst the various pests, rodents have emerged as the most serious and important vertebrate pests in the State inflicting damage right from tillering to maturity (Sood and Guraya, 1976). Initially the damage is restricted to areas near to the surface openings of active burrows but later on spread throughout the crop fields (Sheikher, 1999; Sheikher and Sood, 2000). The present studies were conducted to survey and identify the rodent pests in wheat fields of different areas of mid hills to assess losses caused by them at different crop growth stages.

The studies were conducted in University farm as well as in farmer's fields. Trapping was done continuously for three days during first week of every month from germination till harvesting at five locations to work out the trap indices and per cent population of different rodent species. Distribution of burrows on steps and floor in wheat fields were recorded at different growth stages of the crop. Observations on healthy and cut tillers per square meter at three sites (selected at random) in each field were recorded at seedling, tillering, flowering, milky and maturity stage of the crop to assess the damage in terms of cut tillers and grain yield (average grain weight/ tiller x damaged tillers).The yield losses at initial stages were worked out on the basis of damaged tillers and average yield/ tiller for the area.

Studies revealed that the lesser bandicoot rat (*Bandicota bengalensis*), field mice (*Mus booduga*), house mice (*M. musculus*) and house rat (*Rattus rattus* and *R. meltada*) were common in mid hills of the State. The trap indices for *B. bengalensis*, *M. musculus*, *M. booduga*, *R. rattus* and *R. meltada* were 0.67, 0.42, 0.50, 0.17 and 0.24, respectively (Table 1). *Bandicota bengalensis* was the most serious pest as it constituted 33.33 per cent of the total rodent population, followed by *M. booduga* and *M. musculus* which constituted 25.0 and 21.0 per cent of the total population, respectively. The average number of active burrows increased from 9.33 (all in the steps) at the time of germination to 48.01 per hectare at the time of harvesting (Table 2). Majority of the burrows of *B. bengalensis* and other rats shifted to the crop area at the time of harvesting whereas those of mice were still on the steps/ periphery. *Bandicota bengalensis* alone was responsible for 45.14 per cent of the total burrows (59.99 per cent in the crop area/ floor and rest on the steps/ periphery).

Mice burrows accounted for 31.95 per cent of the total burrows, with 76.08 per cent on the steps. The active burrows of other rats were 22.91 per cent of the total, with majority (60.64 %) in the crop area (Table 2).

Table 1. Trap indices of rodents in wheat fields

	B. bengalensis	*Mus booduga*	*M. musculus*	*Rattus rattus*	*R. meltada*
Trap indices/ day	0.67± 0.94	0.50± 0.64	0.42± 0.33	0.24± 0.33	0.17± 0.23
Per cent population	33.33	25.0	21.0	12.0	8.33

± = Standard error (mean)

Table 2. Distribution of rodent burrows in wheat fields

Activity (Burrows/ ha)	*B. bengalensis*		Other rats		Mice		Total
	Steps	Floor	Steps	Floor	Steps	Floor	
Minimum	2.33 (100.0)*	0.0 (0.0)	1.67 (100.0)	0.0 (0.0)	5.33 (100.0)	0.0 (0.0)	9.33
Maximum	8.67 (40.01)	13.0 (59.99)	4.33 (39.36)	6.67 (60.64)	11.67 (76.08)	3.67 (23.92)	48.01

* Figures in parenthesis are percentage of total burrows

Damage by rodents was observed from seedling stage till maturity and harvesting of the crop, however the maximum loss was recorded at the time of maturity when ear head bearing tillers were severely damaged by the rodents near the base and the grains were consumed. They also dragged tillers to their burrows and hoarded the ear heads neatly in the form of a stack covered by light layer of soil. The maximum rodent damage in terms of cut tillers (9.80/ m^2) was recorded at maturity stage (Table 3) followed by milky stage (6.54/ m^2), flowering stage (3.61/ m^2), tillering (1.29 / m^2) and minimum at seedling stage (0.68/ m^2).

These results are in agreement to those of Awasthi *et al.* (2000), who also observed similar type of rodent damage in wheat fields in Madhya Pradesh. The live burrow density increased from 9.33 (at seedling) to 48.01 burrows/ hectare (at maturity).

The yield loss varied from 0.096 q/ ha at seedling to 1.32 q/ ha at maturity. These findings get support from Awasthi *et al.* (2001) and Ahmed and Prashad (2001).

Table 3. Rodent damage in wheat fields at different crop growth stages

Crop growth stage	Damaged tillers/ m^2*	Live burrow density/ ha	Yield losses (q/ ha)
Seedling	0.68	9.33	0.096
Tillering	1.29	12.84	0.169
Flowering	3.61	19.73	0.570
Milky	6.54	32.46	1.142
Maturity	9.80	48.01	1.321

* Each value is mean of nine observations

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