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Abstract H-4

CURRENT STATUS OF VERTEBRATE PEST MANAGEMENT
IN FIELD CROPS IN BANGLADESH

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The paper reviews the vertebrate pest research carried out by the Vertebrate Pest Section of Bangladesh Agricultural Research Institute (BARI) from 1970 to the present. The research activities are in five categories: (1) basic studies of the biology, movements, and food habits of pest species, (2) laboratory evaluations of chemical control agents (rodenticides and bird repellents), (3) field trials of control methods, (4) damage assessments in field crops (damage estimates and evaluation of damage-assessment methods), and (5) recommendations and training.

A 1979 survey of 303 wheat fields in 4 districts of Bangladesh indicated a 12.1% loss of the mature wheat crop due to rat damage. This represents approximately 77,000 tons of wheat per year in Bangladesh. The lesser bandicoot rat (Bandicota bengalensis) was responsible for the most damage to wheat. Survey in 6 districts of Bangladesh in 1982 indicated an average of 3.4% damage to the mature wheat crop. There was higher damage in the nonirrigated fields than in the irrigated fields. Though laboratory and field trials show greater efficacy of the anticoagulant rodenticides over zinc phosphide against the bandicoot rat, the zinc phosphide bait is recommended for wheat field rat control in Bangladesh on ad hoc basis for reasons of past standardization and its present availability at a lower price in Bangladesh than the nonstandardized new anticoagulant baits.

Simulated rat damage studies in transplanted aman rice and wheat crops showed significant yield reductions for damage levels of more than 10% plants after the booting stage. Rat damage control is, therefore, recommended from the booting stage of these crops. A radio-telemetry study in one wheat field

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showed that the bandicoot rats spent most of their time in wheat fields with an average of 18 m² home range in mature wheat fields. Such home range data indicated effectiveness of rodenticide bait applications directly in rat burrows or within 2 m of these burrows.

Studies in deepwater aman rice areas indicated different species composition of rodents in island households and in surrounding deepwater rice fields. The roof rat (Rattus rattus) was the predominant rat species in island households before the peak flooding of surrounding rice fields. The population of the lesser bandicoot rat increased in the islands during peak flooding of rice fields probably because of migration of rats from flooded fields. Damage to deepwater rice plants before maturity was caused by the greater bandicoot rat (Bandicota indica) and the lesser bandicoot rat (B. bengalensis) with higher abundance of the former species, but the most rat burrows in harvested fields were of lesser bandicoot rats. Effective rodent control in island households can be achieved with baiting both 2% zinc phosphide and 0.005% brodifacoum after peak flooding of the surrounding rice fields. Three rounds of baiting in island households and in deepwater rice fields with 0.005% brodifacoum bait during peak flood period reduced rat activities and crop damages in both locations. In deepwater rice fields, an 1.3% yield loss was estimated by considering quantities of hoarded rice panicles in rat burrows in harvested fields. Less than 1.00% rat damage of sugarcane plants was recorded during the first six months of the crop cycle in the North Bengal Sugar Mills zone due to Indian mole rat (Nesokia indica).

Seed treatments with 0.25% and 0.50% concentrations of methiocarb and 1.2% concentration of copper oxychloride were found to be effective in reducing bird damage to sprouting wheat seeds after sowing. Though methiocarb is superior to copper oxychloride as a bird repellent in most trials, its higher cost, toxicity to birds, and the unavailability in Bangladesh necessitated further trials of copper oxychloride as it is lower cost, safe to humans and is available. Another bird repellent chemical, Avitrol is effective in reducing bird damage to maize cobs by selective treatment of a few cobs in each row after the milk stage.

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In 1983 the Vertebrate Pest Section (VPS) participated in a nationwide rat control campaign in wheat fields that was organised in cooperation with the Directorate of Plant Protection, German-Bangladesh Plant Protection Programme (GTZ). The VPS scientists trained Plant Protection Assistants, distributed information materials, and prepared and distributed 19,600 zinc phosphide bait packets in Bogra, Dinajpur, and Rangpur districts during the campaign.