

Pest Control and Management

OTHER PESTS

Estimating rat damage in deep water rice

Md. S. Ahmed, Entomology Division, Bangladesh Rice Research Institute; and M. Y. Nian, M. E. Haque, and J. E. Brooks, Vertebrate Pest Section, Bangladesh Agricultural Research Institute, Joydebpur, Gazipur, Bangladesh

In Bangladesh, rat damage is estimated by quadrat sampling, but the method is not yet reliable for deep water rice. In 1982, we used burrow system density and average amount of stored rice per system to estimate grain loss due to rodents in several deep water areas.

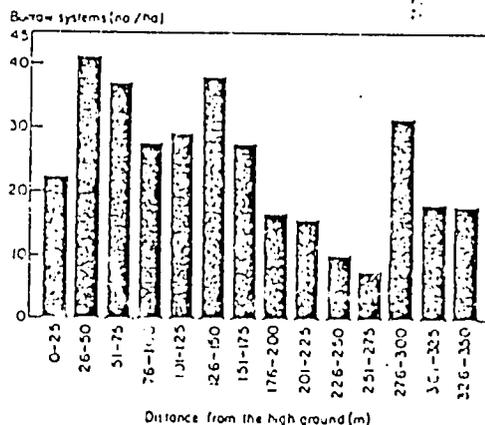
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IRRN 11:1 (February 1986) 23

Data on the density of rat burrow systems/ha were obtained in 7 deep water Upa-zillas (subdistricts) by taking a 30-m-wide transect and crossing 10 to 30 fields from the nearest high ground out to 350 m (see figure). Density within the first 25 m was low because those fields are excavated for repairing highways and to build up island-villages. Burrow system density increased from the 26th m and was almost constant to 175 m, but was low between 176-275 m from high ground. Observations indicated that field condition was more important to burrow density than distance to high ground.

At harvest, we collected 23 samples of cached rice from burrow systems. Both large and small burrows contained an average 1.7 kg rice (see table).

Damage varies from Upa-zilla to Upa-zilla. Areas where floods receded first were hardest hit. Low damage and low burrow densities in Rupganj, Polash, and Narshingdhi reflect their low lying nature. Even at harvest the water table was within 0.25 cm of the surface and some fields had 2-5 cm standing water. Under such conditions, bandicoot rats do not invade the fields, but burrow into the shallow burds separating fields. Damage was thus minimal. Mean density of burrow systems/ha was 35, mean stored rice was 57.8 kg/ha, and average damage was



Relation between burrow system density in deep water rice areas and distance from the high ground, Bangladesh, 1982.

5.7% of the crop, although farmers reduced this by collecting cached rice at harvest.

Based on 57.8 kg rice/ha stored by rats, the national loss of deep water rice in 1982 was 89,414 t of paddy.

Traditional pest control practices in West Africa

S.A. Raymond, formerly plant pathologist, UNDP-FAO-ITA-Sierra Leone Rice Research Project, Rice Research Station, Rokupr, Sierra Leone. Present address: International Potato Center, Lima, Peru

Extensive surveys of West African rice farmers, particularly in Sierra Leone, have provided valuable information about pest management practices. Following are some common practices.

Felled tree trunks and other wood remnants are left to help reduce termite damage on rice. When newly cleared fields are completely free of logs, termites feed on rice roots and kill many seedlings.

Before rainy season peaks, soil is mounded so that even when fields are flooded, soil on the mounds remains above water. Weeds emerge and grow. Just before field preparation and transplanting, mounds are broken up and scattered, which kills the weeds. This practice is particularly common in the north, where lowland rice farms are located.

Fields are fenced with palm fronds to prevent rodents from entering. Rodents cause major damage in many rice

growing areas in Africa.

In Sierra Leone, a mixture of eight or more rice varieties is planted in traditional upland rice areas. The mixture of varieties reduces damage by insect pests and diseases and provides stable yields. It is common to see rice fields with a mixture of varieties at varying maturity. Some farmers said this practice makes rice available as needed. Bulk storage encourages destructive storage pests such as rice weevils.

Birds are major pests of rice in West Africa; therefore farmers like awned varieties, which lessen bird damage. *Oryza glaberrima* and *O. sativa indica* varieties such as Rok 16 and Ngovie are popular.

In mangrove swamps, farmers plant several rice seedlings per hill to compensate for crab damage. Planting older seedlings also reduces damage.

In a village or town, farmers tend to grow the variety or varieties with similar duration planted at more or less the same time. A variety that matures earlier than others planted nearby will have greater bird damage.

Integrated with other tactics, these simple practices could serve as a basis for effective pest management programs.

Rat damage to deep water rice based upon cached rice, in Bangladesh in 1982.

Area	Burrow systems/ha	Estimated ^a stored rice (kg/ha)	% loss ^b from 10:1
Manikganj	76	126	12
Manikganj	71	119	12
Manikganj	42	70	7
Mujapur	60	100	10
Rupganj	18	30	3
Rupganj	10	17	2
Polash	21	35	3
Narshingdhi	20	33	3
Daudkandi	27	45	4
Daudkandi	11	19	2
Gazaria	24	40	4
Gazaria	36	60	6
Mean	35	58	6

^aBased on 1.7 kg/system (mean of 23 samples of cached rice). ^bAs national yield/ha of 1982-83 season.