



WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiological Unit,

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Vol. 35 No. 45

01st – 07th November 2008

Rat Control in the Field

In the last issue, some facts about rodent behavior and their biology were discussed. Methods that can be applied in control of rat population in agricultural lands especially in paddy fields are discussed in this issue.

There are two main reasons why rat population should be controlled. One reason is the economic loss caused by destruction of crop and other properties. The second is due to their role in disease transmission to humans and other animals.

There are traditional methods of pest control that farmers had practiced for ages. However, with the introduction of 'new' and quick methods of pest control, mainly chemical control has resulted in most of these traditional practices to become almost extinct. Meanwhile, we do not know exactly how many more such practices have vanished without leaving any trace of knowledge behind. As well, introduction of pesticides and chemical fertilizers during the so called 'Green Revolution' would have had adversely affected the natural enemies of rodents while making the situation further worse. Although there are effective chemical control methods of rats, it is more advisable to encourage or 're-introduce' traditional methods since they are more environmental friendly, cheaper and are less harmful to other animals if at all.

Traditional control

Most of the traditional rat control practices in paddy fields are aimed at making the environment less conducive rat to inhabit or allow them to be prey of their predators. Proper maintenance of paddy fields and the surroundings are

important aspects of these control methods.

Following are some of those field practices helped in controlling rat population in and around paddy fields:

- Clean dykes and irrigation canals, including surrounding areas, and make them free of weeds.
- Reduce the size of bunds and dykes in paddy fields to a minimum level as rats prefer to live on higher grounds of the rice fields. This limits the breeding and burrowing sites.
- When rat burrows are noticed, destroy them; cover burrow holes.
- To drive out rats in their burrows and breeding sites, flood paddy fields just below the dyke level. This practice does not kill them, but forces them to leave paddy fields.
- Follow synchronised planting, i.e., planting at the same time with other farmers in the same area. This prevents migrating rats from one field to the next and ensuring a continuous supply of food which will result in increased breeding capacity.
- Proper management of straw after harvesting. Although removing of straw completely out of the field after harvesting is helpful, this will lose a rich source of fertilizer and nutrient to the soil. Therefore, dispersing straw across the land rather than heaping them up is advisable.
- Do not kill predators of rats namely, mongoose, snakes, owls and other birds. In fact, whenever possible, they should be encouraged to roam the area. One of the traditional

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practices was placing supportive structures at different places of the paddy field for birds to rest. Most commonly used method was placing stumps of coconut branches. Preserving at least a few trees around the paddy fields will also ensure a place birds to rest.

Traditionally practiced rat control methods

Most of the traditionally practiced rat control methods are simple and generally harmless to other animals. Farmers had placed cut pieces of stalks of flowering papaw trees mixed with water as a rat control method. Dispersing gliricidia flowers in the field is another traditionally practiced rat control method in paddy fields. Farmers also believed that by dispersing or hanging coconut leaves or drawings of reptiles in paddy fields can repel rats from paddy fields.

Rat traps and baits

A bamboo stalk connected to a polythene bag is a kind of mouse trap traditionally used which can be easily prepared.

Shallow pans or bowls baited with dried fish mixed with cement is also effective in rat elimination. A mixture of corn meal, brown sugar and plaster of Paris has been used in some countries. Break-back/snap traps baited with some food items (popularly called 'mouse trap') and cage traps can be used to trap rats. They will be more effective if placed at dusk to lie overnight. By inspection in the morning any trapped rats should be removed carefully.

Community trap barrier system (CTBS) is one of the successful methods used in some South Asian countries. Building one CTBS collectively by a group of 20-30 farmers will be cost effective. This type of trap can lure the rats from neighbouring fields extending as far as 200 meters in every direction. It comprises a plot of rice crop about 20-30 sq. meter in size planted 2-3 weeks earlier than the surrounding crop. The plot is surrounded by a properly built rat proof fence covered with plastic. At every 5-10 meters, a hole is made that leads into the one-way trap. The rats that enter cannot escape and were subsequently caught and removed.

Appropriate use of rodenticides will achieve a desired reduction in rat population. Rodenticides are divided into two major groups as anticoagulants and other compounds. Warfarin is the commonly used anticoagulant in rodent control. Since most of anticoagulants need multiple doses to cause its lethal effect it may require a continuous supply of bait for about 10-15 days or until all feeding ceases. This also will ensure that the entire mouse population at the bait location has had ample opportunity to eat a lethal dose of the bait.

Zinc phosphide is the commonly used non-anticoagulant toxicant. This is a single dose bait with acute poisoning ef-

fect. They are not designed to be left available to rats for more than a few days, as continuous exposure may result in "bait shyness". The risk of secondary poisoning to other animals is also higher than that of anticoagulants. Whenever a quick population reduction is desired or anticoagulants cannot be safely set out for the required length of time, single dose baits are useful. Disposal of all poisoned rats particularly those killed by single-dose baits, should be done safely.

Stray dogs and cats, crows and other animals may be at risk through feeding on dying or dead rats. This is called secondary poisoning. Normally these animals, because of their size, would need to feed on several rats before they would be affected and more to receive a lethal dose. The chance is very low with most anticoagulants and even with acute poisonings because most of the poison is broken down in the stomach. Nevertheless, the potential danger of secondary poisoning all the time should be borne in mind.

Bait selection and bait shyness

Food preferences may vary among species and individual rodents. Some rodent species are very suspicious and tend to avoid any object that is new to it. It may take several days before an individual will enter a trap or take bait. Even then, if the new object appears to be food, initially they consume only a small amount. If the food containing poison causes symptoms after feeding, rats may not touch the bait again. This is commonly called bait shyness. Therefore it is advisable to place baits with their preferred food sans poison for a couple of days until they get attracted to it. Baits that are similar to foods mice are accustomed to eating, are often more effective.

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This article was prepared by Dr. Sudath Samaraweera, Consultant Community Physician.

Table 1: Vaccine-preventable Diseases & AFP

25th - 31st October 2008 (44thWeek)

Disease	No. of Cases by Province									Number of cases during current week in 2008	Number of cases during same week in 2007	Total number of cases to date in 2008	Total number of cases to date in 2007	Difference between the number of cases to date between 2008 & 2007
	W	C	S	N	E	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 KL=1	00	01 GL=1	01 JF=1	00	00	00	00	00	03	00	86	69	+24.6%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	00.0%
Measles	00	00	00	00	00	00	00	00	00	00	02	100	69	+44.9%
Tetanus	00	00	00	00	00	00	00	00	00	00	00	33	31	+06.5%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	00	44	39	+12.8%
Tuberculosis	28	23	07	00	01	00	21	00	00	80	261	7052	8402	-16.1%

Table 2: Newly Introduced Notifiable Disease

25th - 31st October 2008 (44thWeek)

Disease	No. of Cases by Province									Number of cases during current week in 2008	Number of cases during same week in 2007	Total number of cases to date in 2008	Total number of cases to date in 2007	Difference between the number of cases to date between 2008 & 2007
	W	C	S	N	E	NW	NC	U	Sab					
Chicken-pox	09	04	13	00	06	10	06	01	14	63	49	4689	2885	+62.5%
Meningitis	09 CB=3 GM=2 KL=4	00	02 GL=1 HA=1	00	02 BT=1 TR=1	03 PU=3	01 AP=1	00	03 RP=1 KG=2	20	17	1141	589	+93.7%
Mumps	01	12	05	00	00	05	01	08	04	36	31	2535	1863	+36.0%

Key to Table 1 & 2

Provinces: W: Western, C: Central, S: Southern, N: North, E: East, NC: North Central, NW: North Western, U: Uva, Sab: Sabaragamuwa.

DPDHS Divisions: CB: Colombo, GM: Gampaha, KL: Kalutara, KD: Kandy, ML: Matale, NE: Nuwara Eliya, GL: Galle, HB: Hambantota, MT: Matara, JF: Jaffna, KN: Killinochchi, MN: Mannar, VA: Vavuniya, MU: Mullaitivu, BT: Batticaloa, AM: Ampara, TR: Trincomalee, KM: Kalmunai, KR: Kurunegala, PU: Puttalam, AP: Anuradhapura, PO: Polonnaruwa, BD: Badulla, MO: Moneragala, RP: Ratnapura, KG: Kegalle.

Table 3: Laboratory Surveillance of Dengue Fever

25th - 31st October 2008 (44thWeek)

Samples	Number tested		Number positive *		Serotypes										
					D ₁		D ₂		D ₃		D ₄		Negative		
	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	
Number for current week	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
Total number to date in 2008	124	138	09	23	00	00	06	08	01	08	00	00	02	00	

Sources: Genetech Molecular Diagnostics & School of Gene Technology, Colombo [GT] and Genetic Laboratory Asiri Surgical Hospital [AH]

* Not all positives are subjected to serotyping.

NA= Not Available.

Data Sources:

Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis, Chickenpox, Meningitis, Mumps.

Special Surveillance: Acute Flaccid Paralysis.

National Control Program for Tuberculosis and Chest Diseases: Tuberculosis.

Table 4: Selected notifiable diseases reported by Medical Officers of Health
25th - 31st October 2008 (44th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Returns Received Timely*
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%		
Colombo	22	1433	8	238	0	15	8	148	22	134	20	904	0	6	2	102	0	0	77
Gampaha	10	870	3	195	0	20	2	52	0	103	16	731	0	7	5	168	0	6	86
Kalutara	3	422	4	283	0	13	2	64	0	26	8	560	0	3	0	42	0	2	75
Kandy	8	264	4	283	1	8	1	58	1	99	6	440	0	92	3	122	0	2	80
Matale	0	142	9	196	0	4	2	50	1	14	2	695	0	2	0	27	0	0	92
Nuwara	0	27	16	257	0	3	2	238	0	166	3	61	0	37	0	106	0	1	85
Galle	5	98	4	177	0	20	0	17	0	43	14	387	0	14	0	8	0	5	76
Hambantota	0	87	3	100	0	6	1	8	0	12	1	96	0	90	0	16	0	1	91
Matara	7	303	3	193	0	14	0	35	0	15	10	439	2	218	0	14	0	2	82
Jaffna	0	58	1	142	0	4	0	251	0	17	0	1	0	154	0	37	0	0	25
Kilinochchi	0	0	0	118	0	0	0	1	0	4	0	2	0	0	0	1	0	0	0
Mannar	0	25	0	21	0	6	0	156	0	0	0	0	0	1	1	16	0	0	50
Vavuniya	0	12	0	58	0	3	0	13	0	22	0	5	0	1	0	5	0	0	100
Mullaitivu	0	0	0	52	0	0	0	16	0	13	0	0	0	1	0	9	0	1	0
Batticaloa	0	86	9	168	0	7	1	27	0	29	0	9	0	0	0	92	1	16	73
Ampara	2	33	1	257	0	0	0	9	0	283	0	23	0	0	0	13	0	0	71
Trincomalee	1	178	1	106	0	1	0	13	0	14	0	30	0	17	0	13	0	0	70
Kurunegala	5	319	4	213	0	15	0	52	1	24	11	610	1	30	0	74	0	6	89
Puttalam	1	278	5	115	0	8	1	154	0	39	1	62	1	38	0	30	0	5	89
Anuradhapu	0	118	5	118	0	10	0	12	0	10	0	237	0	11	1	15	0	3	79
Polonnaruw	2	64	0	128	0	1	0	26	0	23	0	68	0	1	1	21	0	0	100
Badulla	1	86	11	453	0	6	0	121	0	96	2	65	1	109	6	148	0	1	87
Monaragala	0	57	5	341	0	3	6	46	0	121	2	93	1	100	3	51	0	0	91
Ratnapura	4	261	5	361	0	32	0	51	0	80	6	205	0	78	2	54	0	0	83
Kegalle	7	396	9	291	0	26	0	74	1	16	18	514	0	64	8	489	0	1	82
Kalmunai	0	37	5	255	0	2	1	13	0	16	0	3	0	3	0	25	0	0	69
SRI LANKA	78	5654	115	5119	1	227	27	1705	26	1419	120	6240	6	1077	32	1698	1	52	78

Source: Weekly Returns of Communicable Diseases (WRCD).

*Dengue Fever / DHF refers to Dengue Fever / Dengue Haemorrhagic Fever.

**Timely refers to returns received on or before 08 November, 2008 Total number of reporting units =309. Number of reporting units data provided for the current week: 241

PRINTING OF THIS PUBLICATION IS FUNDED BY THE UNITED NATIONS CHILDREN'S FUND (UNICEF).

Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail to chepid@slt.net.lk.

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