

Rat busters

by Rona Niña Mae Rojas

IRRI's rodent management team braves the rough mountains of the north to help farmers save their crops from rats

There was simply no turning back—literally—for the rodent management team from the International Rice Research Institute (IRRI) as the group headed to the remote mountaintop village of Belwang in Sadanga, Mountain Province, Philippines. Flanked by rock walls on one side and a steep drop on the other, the IRRI van carefully traversed the narrow roads that made every turn and swerve along the Cordillera Mountain Range in the Philippines a daring game with fate.

The group was led by rodent ecology expert and Irrigated Rice Research Consortium (IRRC) coordinator Grant Singleton. With him were PhD scholar Nyo Me Htwe and wildlife biologists Harvey Garcia and Vincent Sluydts.

Irony in the terraces

From Sadanga town proper, the IRRI group set out on foot for the village of Belwang. They were accompanied by Rolf Boller, project leader of the Environment and Sustainable Agriculture Program of the Social Action Development Center (SADC) in Bontoc-Lagawe, and also by representatives from the Office of the Provincial Agriculturist-Department of Agriculture (OPA-DA) in Mountain Province.

Under the scorching midday sun, the group had to go through two valleys, walk along the narrow edges of the Sadanga terraces, and climb many steps to the village of Belwang. The sweeping views of the mountain ranges carved with rice terraces hundreds of years old offered a respite from the otherwise arduous trek. The team, however, couldn't help but notice the patches of rice terraces damaged by rats (see *When*



The IRRI van carefully navigates through the landslide that blocked the path to home. The narrow road flanked by a mountain wall and a cliff made the trek perilous.

ROLF BOLLER

rats attack on pages 44-45 of *Rice Today* Vol. 8, No. 4).

Belwang village is home to around 115 families who rely heavily on the produce from their land. Their main crop is heirloom rice, the native rice variety of the region (see *The seed keeper's treasure* on pages 12-15 of *Rice Today* Vol. 9, No. 4), which is planted in just one season, from January to March, and harvested from July to September. According to local farmer Banawag Kadatar, the season's harvest is often just enough for their food for the next 6 months. Sometimes, a few farmers manage to plant glutinous rice, which is sold for export.

"The amount of rice yield depends on the size of your land and on whether or not there are rat infestations," says Peter Dicang, a rice farmer. "If our stored rice is not enough, we are forced to buy rice from the National Food Authority using the money we get from selling glutinous rice."

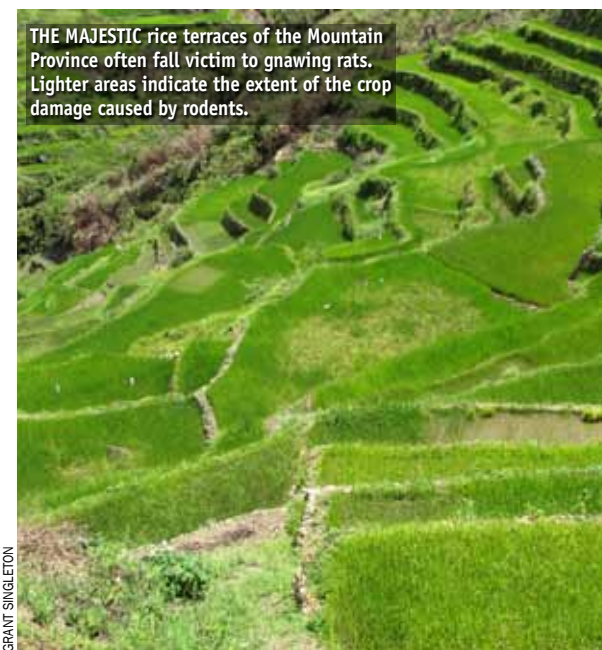
In the midst of the picturesque green surroundings, it is unfortunate that these farmers can barely eke out a living. To augment farmers' income, the SADC and OPA-DA joined forces to help farmers in Belwang establish an agroforestry system.

The outbreak

Through a farmer field school in agroforestry, the village farmers started organic farming of citrus fruits to take advantage of the mountain's soil quality. The village had a successful run in its citrus fruit plantation for 3 years, helping boost farmers' incomes.

Although damages caused by rats were observed in the previous planting seasons, the rats didn't start to attack the village crops on a massive scale until 2009, resulting in heavy losses to both rice and citrus farmers. As many as 27% of the citrus trees were damaged and, by 2010, rice yield losses reached an alarming 30–50%.

DA and SADC then decided to seek help in tackling the chronic problem of rodent infestations. Mr. Boller got in touch with Dr. Singleton and asked him to train the farmers in Belwang.



THE MAJESTIC rice terraces of the Mountain Province often fall victim to gnawing rats. Lighter areas indicate the extent of the crop damage caused by rodents.

GRANT SINGLETON

Rat traps

After two-and-a-half hours of braving the vertical pathways to Belwang, the group was finally welcomed by the villagers.

The group divided into three teams to set up 70 rat traps in and around the village houses, rice terraces, and citrus fruit orchards. The farmers enthusiastically assisted the team in setting up the traps, pointing out areas where rodents were frequently seen. Mr. Boller believes that this activity is a useful hands-on exercise for the farmers in rat-trapping techniques. "It took away their fear from the 'unknown' animal," he shares. "It was an important step towards knowing your 'enemy' first."

Early the next day, the traps caught five different rat species. Three are pest species (*Rattus tanezumi*, *R. exulans*, and *Mus musculus*), whereas two (*R. everetti* and *Chrotomys whiteheadi*) are species that are beneficial to rice crops.

The guilty ones

Around 100 people participated in the training course. With inputs from the farmers themselves, Dr. Singleton constructed the farmers' cropping calendar. The interactive course determined the size of the farmers' rice lands, their expected average crop yield, and actual yield after rat infestation. Rodents were identified as the major pest in upland rice production. The participants made a detailed decision analysis of their existing crop management strategies, including rat-trapping methods. All farmers conducted weed clearing of planting areas and blocked burrows during land preparation, maximum tillering, and booting stages of the rice crop. They were introduced to the benefits of community action, synchronous cropping (planting at the same time), good hygiene in fields and houses, and the community trap-barrier system (CTBS). CTBS is a plastic fence surrounding a small plot of rice planted 2–3 weeks earlier than the surrounding crop, with traps set into the plastic. Dr. Singleton emphasized that the methods to control the rat population could be adapted and changed to fit the community's own circumstances.

The farmers eagerly participated during the discussion on the biological characteristics of the pest species, rodent



1. DR. GRANT Singleton (left) and Vincent Sluydts (right) hold up a sketch of the terraces in Belwang village to draw insights from farmers and help them identify their cropping patterns and practices.
2. HOLDING UP a "good rat" caught during the trapping activity, Dr. Singleton shows the participants the physical characteristics of beneficial species *Rattus everetti*.



population dynamics, and the possible methods to manage their population. The team explained that the native species *R. everetti* and *C. whiteheadi* are beneficial since they feed on insects, earthworms, and golden apple snails. Some farmers were surprised when they learned that the beneficial species would be freed after the training course. One farmer quickly associated this with the justice system: three pest species were tried and found guilty, but the other beneficial rats did not eat rice and were therefore innocent and free to go.

A mobilized community

Armed with a better understanding of rodent pest species and the methods to manage them, key farmers and DA officials mapped out an action plan to overcome their current rodent problems. They agreed to act as a community and seek assistance from the local government to buy rat traps. They planned to set these up in and around the village where heavy damage was observed.

For the next cropping season, the farmers will continue their past practices of clearing weeds and blocking burrows in the field and, together, establish a CTBS. Cooperation among them is crucial considering that they need to designate a rice plot as bait to lure rats into it. Rats will follow the plastic fence of the CTBS until they reach a hole that they enter to reach the rice, but instead are caught in a cage trap. The farmers

now know that synchronous planting would benefit the whole community because it allows harvesting to happen at the same time, thus limiting food availability for rats. A continuous food supply leads to significant rat population growth.

Another farmer, Dominga Gayaden, explains, "We have to solve our problems together as a community because we are also the ones who are most affected." Her fellow farmers couldn't agree more.

Roadblocks and sunny days

Dr. Singleton and his team acknowledge that more research has to be conducted on the rice terraces of Mountain Province. The rodent management training conducted in Belwang village is simply a start to a continuous learning experience, for both parties. IRRC technologies, such as ecologically based rodent management, are validated by working closely with farmers in what is known as adaptive research. When farmers understand the ecology of the rodent species in their area, they are better equipped to develop effective management strategies. Simple solutions found together as a community could be successful in protecting crops and, in the long run, lead to increased income. 🌾

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