Country Report on Regional Workshop on Spread Prevention and Control of Apple Snail (*Pomacea spp.)* in Rice (3 Dec 2012 to 7 Dec 2012)

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THE REPUBLIC OF THE UNION OF MYANMAR

Background of the Union of Myanmar

Myanmar is one of the ASEAN member countries. It is endowed with rich natural resources, cultivable land, available water resources and favorable climate. The agriculture sector is the back bone of its economy. Agriculture sector contributes 30 % of GDP, 14 % of total earnings, and employs 61 % of the labor force.

The Union of Myanmar is located between 9^{o} 58´ and 28^{o} 31´ N latitudes and 92 ^{o} 10´ and 101^{o} 9´ E longitudes. The total land area is 676,577 sq.km, with the length of 2,200 km, extending from the North to the South, and 950 km, from the East to the West. Myanmar is bordered with five neighboring countries and has a very long coastal line of about 2,234 kilometers along the Bay of Bengal, Gulf of Mottama and Andaman Sea.

Water Resources

In Myanmar, there are four major river system namely, the Ayeyarwady, the Chindwin, the Sittaung and the Thanlwin, flowing from the North to the South into the Andaman Sea. The available water resources in term of annual discharge rate of the four major rivers and other river systems are estimated to be about 87,673 million acre – feet of total annual flow.

Climate

Myanmar has typically tropical and subtropical climates. There are three seasons, namely, (i) the raining season (mid-May to mid-October), (ii) the winter season (mid-October to mid- February) and (iii) the summer season (mid-February to mid-May). The average annual rainfall varies from 2,540 to 5,080 mm in the coastal and hilly regions and 760 to 1,015 mm in the central Myanmar. The temperature variation across the seasons in the South Myanmar is not much, however in the central plain, the temperature in the hot season may reach to 40^{0}C and in the cold season the temperature is close to 10 - 15^{0} C. It is considerably cooler in the hilly regions where average daily maximum temperature is about 29^{0} C and the minimum is 7^{0}C.

Land area	676,577 square kilometers

Population

Whole country	59.78 million
Population growth	1.1%
Urban population	18.343 million
Rural population	41.437 million
Population density	88 per square kilometer

Agricultural Land

One fourth of total area of the country is cultivated land. Presently, there are about 12.02 million hectares of net sown area in Myanmar, 0.23 million hectares are fallow lands and 5.40 millions of cultivable waste land, is being brought under agriculture. Reserve forest account is 17.91 million hectares. Most of agricultural land, which is about 8.15 million hectares, is currently cultivated by small scale farmers.

Application of Modern Technology

Transfer of technology to farmers through agricultural extension regarding crop cultivation practices, appropriate cropping patterns provision and proper utilization of agricultural inputs, systematic plant protection practices, and postharvest handling techniques are being undertaken. Farmer's education activities include use of mass media (newspaper, radio, television, journalism) distribution of education pamphlets, training and visiting by extension workers in group and individual.

Current Status of Apple Snail (*Pomacea canaliculata*) in Rice in Myanmar

Rice is the staple food of Myanmar. It is extensively grown in all of the almost the 14 states and divisions. Among the net sown area of 12.02 million hectares, the total area of paddy was 8.1 million hectares, comprising 6.8 million hectares under monsoon paddy and 1.3 million hectares under summer paddy (2010-2011).

There are 124 species of insect pests attacking rice. Among them, 20 species are major pests. The golden apple snail (GAS, *Pomacea canaliculata*) was introduced from the People's Republic of China to Northern Shan State in early 1990s as food for human beings. After a few years of its introduction, GAS accidently changed into major pests of rice in Myanmar. It easily spreads through irrigated field, canals, waterlogged areas and rivers. GAS can damage nurseries, direct-seeded rice and newly transplanted rice. At 7 days after transplanting, damaged plants ranged from 8% to 27% (Chanyapate, Agricultural Zoology Group, Division of Entomology and Zoology, personal communication).

The infested areas of GAS in Myanmar are Kachin State, Shan State, Mon State, Kayin State, Bago Region and Tanintharyin Region.

Control Measures used in Myanmar

1.Mechanical Control
2.Cultural Control
3.Biological Control
4.Chemical Control

1. Mechanical Control

1.1. Hand Picking

Hand picking successfully controls snail populations without harming the environment. In this method, the snails are collected in the morning and evening when they are most active and easy to find and then destroyed.

1.2. Trapping

The bamboo or plastic net filled with the leaves of papaya, banana, and eucalyptus, water melon peel are placed alongside the bunds of rice field for easy collection of apple snails.

1.3. Staking

Place the bamboo stakes in water-logged areas or near the canals of the rice field to attract the egg-laying adults. Any egg masses laid on these stakes can be quickly seen and destroyed.

2. Cultural Control

The young transplanted seedlings are most vulnerable during the first 10 days. Planting older seedlings will help to minimize damage. Snails prefer where there is standing water. Therefore, the rice field should be drained and irrigated alternately after transplanting. The ditches within the field are constructed in which the snails can congregate and then they can be easily collected and destroyed. To prevent the snail spread from field to field, the screens are set up at the water inlets and outlets.

3. Biological Control

80 ducks per acre are pastured in the rice field at 30 days after transplanting. Rice-fishing farming system can also be practiced. Stakes for the bird place are created near the bunds of rice field in waterlogged area to pick up the snails.

4. Chemical Control

Bayluscide (Niclosamide) 70 WP, 8.75 g/4.5 liters of water and Metaldehyde are used as a chemical control. Neem cake, jatropha cake and tobacco leaves as botanical pesticide are broadcasted at the rate of 449.54 kg ha^{-1}.

Conclusion

In 2011-2012, the highest GAS infestation was occurred in Mon State and the lowest in Taninthayi Region. However, in 2012-2013, the GAS infestation was only occurred in Kachin, Kayin and Shan (North) States.

Among the above mentioned control measures, hand picking is most widely used and this method can control 80% of snail population.