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# IRRI identifies the first case of rice yellowing syndrome in the Philippines

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The IRRI team, led by Dr. Van Schepler-Luu, investigated reports from the Department of Agriculture- Regional Crop Protection Center (RCPC) and the Stanta Cruz Municipal Agriculture Office of unusual yellowing and stunting in the LAV666 rice variety, locally known as Jackpot 102. Initially, they suspected that the rice plants were infected with tungro or orange leaf disease as the leaves of the infected rice plants turned yellow-orange, one of the key symptoms of tungro.

However, the team confirmed, through RT-PCR and ELISA tests, a co-infection of Rice Grassy Stunt Virus (RGSV) and Rice Ragged Stunt Virus (RRSV) also known as â??yellowing syndrome.â?•

RGSV and RRSV are both common in rice, particularly in South and Southeast Asia. For one, RGSV typically causes pale yellow, narrow leaves, excessive tillering, and stunted growth. In contrast, RRSV causes darker green leaves with serrated, twisted, or curled edges, along with stunted growth. RGSV-infected plants fail to produce panicles, while RRSV shows partial panicle exertion and unfilled grains. However, both viruses could affect panicle exertion in severe cases.

In the area of Sta. Cruz where yellow syndrome has been confirmed, the impact is severe, with very low or nearly no harvest obtained. According to the farm caretaker, the infected field affected by yellowing syndrome yielded only 16 cavans, compared to the expected yield of 200 cavans.

Yellowing syndrome first appeared in rice fields in the Mekong Delta, Vietnam, in 1989. Rice plants affected by the disease exhibited a spreading growth pattern, stunted growth, and yellowing leaves. By 1997, the problem had become more severe, affecting 5-10% of the region's rice fields, and in some areas, reaching up to 50%. By 2005, studies by Vietnam-based Cuu Long Delta Rice Research Institute researchers showed that rice virus infections were estimated to have caused a loss of around 800,000 tons of rice.

Similar yellowing symptoms were previously seen at IRRI and linked to a different strain of RGSV, later called RGSV2, while the earlier strain, RGSV1, was known to cause more recognizable symptoms. RGSV2 can cause symptoms that resemble tungro, making it harder to diagnose.

Aside from the yellowing and stunting symptoms, farmers and field technicians reported high populations of brown planthoppers or Nilaparvata lugens (BPH), pests known to transmit RGSV, RRSV, and instances of hopper burns in nearby fields. Farmers also shared that yellowing and stunting symptoms first appeared in patches during the second round of fertilizer application, with a total of three applications conducted. High fertilizer use could intensify the severity of viral diseases in rice.

In response to the incident, IRRI Senior Associate Scientist Dr. Gilda Jonson emphasized the critical need for awareness of rice disease symptoms and the use of proper diagnostic tools to ensure accurate and effective disease management.

â??Because multiple rice viruses can cause overlapping symptoms, knowledge and awareness of symptoms and identification of insects present in the field are necessary to avoid misidentification," Dr. Jonson said.

â??We urge the use of Enzyme-linked immunosorbent assay (ELISA), PCR, and RT-PCR tests to guide proper disease management,â?• she added.

The team also recommended practicing synchronized planting, immediate plowing of infected stubbles, and cautious use of insecticides to prevent resurgence. Most importantly, planting varieties resistant to these diseases or to BPH is the recommended long-term control.

IRRI thanks the Department of Agriculture and the Sta. Cruz Municipal Agriculture Office for their support and states its commitment to working with them to protect rice farmers. Moreover, it encourages local government units (LGUs) to be more vigilant in monitoring, in coordination with the Department of Agriculture-Regional Field Offices (RFOs), particularly its Regulatory Division and RCPC.

â??With the re-emergence of these viruses, itâ??s critical we stay ahead of potential outbreaks,â?• said Dr. Van Schepler-Luu. â??We remain committed to working with partners to closely monitor the disease, identify new sources of resistance and protect rice productivity in the Philippines.â?•