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PROTECTION MEASURES AGAINST HARMFUL WHEAT BUG (EURYGASTER INTEGRICEPS)

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Abstract: This article provides information about the damage caused by the harmful wheat bug to wheat fields and the measures to control it.

Keywords: wheat, bug, chemical control, biological control, agrotechnical measures, pesticides, larva.

Introduction: In our republic, cereal grain crops are the main source of food. To increase yield and produce high-quality crops, proper implementation of agrotechnical practices, creation of new varieties, and protection of plants from diseases and pests are urgent issues. Among the chewing pests in wheat cultivation, the harmful bug (Eurygaster integriceps Put.) causes significant economic damage. This pest is found in Central Asia, the Caucasus, Transcaucasia, southern parts of European Russia, Western Europe, and all countries of the Middle East [2][3].

The adult harmful bug measures 10–12 mm in length; its body color ranges from yellow to yellowish-gray, with a marbled pattern on the surface. The larva differs from the adult bug by its smaller size, more rounded body, and absence of wings. In early stages, the larva is almost semicircular and yellowish-brown; as it grows, it elongates and its color lightens. From the second instar, the larva's scent gland openings (Maxotin) become visible. By the fifth instar, wing buds and shield-like structures appear on the dorsal thorax. Larvae reach 8–10 mm in length. The bug's eggs are spherical and greenish, with a diameter of about 1.1 mm. Parasitized eggs turn dark.

This pest overwinters as an adult, hiding among weeds, under their roots, under fallen leaves, or sometimes in the topsoil and plant debris. In Central Asia, most bugs migrate to mountains for overwintering, sheltering under stones or vegetation. When the temperature in overwintering sites reaches 17–20°C in March–April, bugs fly to the crop fields.

The bug's feeding causes yellowing and drying of the middle leaf in young plants, sometimes killing them entirely. The wounded areas secrete sap, which hardens and accumulates a whitish substance—a clear sign of bug presence. After emergence from overwintering sites, bugs quickly start laying eggs on both sides of wheat leaves, mainly on the underside. Each female lays 100–180, sometimes up to 300 eggs in two rows, over approximately one month. Eggs hatch in 6–16 days. Initially, larvae cluster on leaves, feeding on sap at the egg hatch site, then move upward to feed. The larval period lasts 15–30 days. In Central Asia, bugs develop wings in May–June.

New generations begin moving to mountains for summer diapause in early June. Many bugs enter summer diapause without interrupting their winter dormancy, though some show short activity in autumn, feeding on cereal plants near overwintering sites. Old bugs mostly die off by then. The bug's life cycle is univoltine (one generation per year) [2][3].

Data shows that these pests can cause up to 23.9% yield losses in wheat, with severe infestations reducing yields by 50–70%. Therefore, developing and implementing integrated control measures against this pest is essential.

Control methods combine agrotechnical, chemical, and biological approaches. According to researchers X.X. Kimsanboyev and B. Boltayev from the Plant Protection Department, integrated agrotechnical measures are effective against chewing pests. For example, irrigation in early September improves soil moisture, followed by soil leveling and preparation for sowing in late September. Phosphorus and potassium fertilizers are adequately applied during soil preparation. After sowing wheat, nitrogen fertilizers and irrigation are applied in mid-November, continuing until mid-December depending on climate. Further irrigations with nitrogen fertilization continue from mid-February to mid-April. Soil cultivation takes place from early June to early August, with organic, phosphorus, and potassium fertilizers applied in late July and August. Timely implementation of these measures against chewing pests is crucial for achieving high wheat yields [2][3].

Chemical control plays a vital role in pest management. Pesticides act quickly on harmful organisms. Currently, pesticides such as Karate 5% EC, Kinmiks 5% EC, BI-58 (new), Sumi Alpha 5% EC, Desis 2.5% EC, Talstar 10% EC, Fury 10% EC, Actara 25% EC, Mospilan 20% EC, and Regent 80% EC are widely used against chewing pests in wheat with high efficiency. When one or two bugs are found per square meter, treatments with BI-58 (1.5 l/ha), Bulldog (0.5 l/ha), or Kinmiks (0.2 l/ha) are recommended [2][3]. Studies show that treated fields have higher yields than untreated ones.

Biological control options against the harmful bug are limited. Natural enemies such as telenomine wasps, ants, birds, and pathogenic organisms restrict their population under natural conditions. In Central Asia, parasitism by parasitoid wasps on adult bugs has been observed. When parasitism reaches 50%, or a 1:3 ratio of parasite to host is present, chemical treatments may be unnecessary [4]. In some districts of Uzbekistan, bug eggs have been found to be fully parasitized by egg parasitoids, highlighting the importance of utilizing overwintering stocks of these natural enemies.

Conclusion: An integrated approach combining agrotechnical, biological, and chemical methods provides high efficiency in controlling the harmful bug. Developing ecologically safe and economically feasible strategies against this pest is essential in agro-industrial production. Preserving and enhancing natural entomophages, monitoring pest populations, and applying chemical treatments only when necessary will improve future pest management systems.

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