About ICARDA and the CGIAR

ICARDA

Established in 1977, the International Center for Agricultural Research in the Dry Areas (ICARDA) is one of 15 centers supported by the CGIAR. ICARDA's mission is to contribute to the improvement of livelihoods of the resource-poor in dry areas by enhancing food security and alleviating poverty through research and partnerships to achieve sustainable increases in agricultural productivity and income, while ensuring the efficient and more equitable use and conservation of natural resources.

ICARDA has a global mandate for the improvement of barley, lentil and faba bean, and serves the non-tropical dry areas for the improvement of on-farm water use efficiency, rangeland and small-ruminant production. In the Central and West Asia and North Africa region, ICARDA contributes to the improvement of bread and durum wheats, kabuli chickpea, pasture and forage legumes, and associated farming systems. It also works on improved land management, diversification of production systems, and value-added crop and livestock products. Social, economic and policy research is an integral component of ICARDA's research to better target poverty and to enhance the uptake and maximize impact of research outputs.

CGIAR

CGIAR is a global research partnership that unites organizations engaged in research for sustainable development. CGIAR research is dedicated to reducing rural poverty, increasing food security, improving human health and nutrition, and ensuring more sustainable management of natural resources. It is carried out by the 15 centers who are members of the CGIAR Consortium in close collaboration with hundreds of partner organizations, including national and regional research institutes, civil society organizations, academia, and the private sector. WWW.cgiar.org

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ICARDA International Center for Agricultural Research in the Dry Areas

Integrated Sunn Pest Management

Approaches for reducing the threat of Sunn Pest to Wheat Harvests

Managing Sunn Pest and its threat to wheat harvests

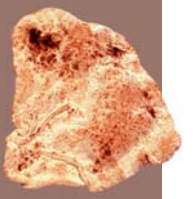
This brochure highlights approaches to reduce the threat of Sunn Pest to wheat crops. They are distilled from research by ICARDA and its partners – the national agricultural research systems in West and Central Asia and advanced research centers. The results of this research suggest practices that countries can adopt to better plan and manage Sunn Pest damage to crops in their wheat growing areas, to protect crops and ensure food security.

Key elements of effective management of Sunn Pest in a national wheat production system:

The threat of Sunn Pest

Sunn Pest[1] is a major constraint to the production of wheat in several areas of Central and West Asia and North Africa. It negatively affects wheat crops at their vegetative growth, heading and maturity stages. Sunn Pest causes two types of damage:

1. Wheat yield loss: causing reductions as high as 90%.
2. Grain quality damage: If 2-5% of the grains in a lot have been fed upon by Sunn Pest, the entire lot may be unusable to make bread. The dough made from this flour will be difficult to process and the bread will not rise (see photo).



1. Know the life cycle of Sunn Pest*

- Adults overwinter beneath litter under shrubs and trees until spring
- Adults migrate from the overwintering locations to cereal fields in early spring
- Adults feed, mate and lay eggs on cereal and weed leaves
- Nymphs have five stages, four of which feed and cause major damage to the cereal grains
- The feeding period of adult insects and nymphs extends from March to June
- The new generation of adults keep feeding on cereal grains to store food for the overwintering period
- Adult insects migrate to the highlands/hills surrounding the fields after harvest in May and June

Five stages of growth, four feed on wheat.

2. Collect Sunn Pest from overwintering sites and cereal fields

Sunn Pest spends a dormant period of some nine months at overwintering sites, mainly in mountains and hills surrounding wheat and barley fields under litter, oak or pine trees or shrubs. They are also found under weeds and wild plants. The insects can be easily collected by hand from wheat fields early in the season, before their eggs have been laid and from overwintering sites. Pest Control Departments in some countries offer financial incentives in return for collected insects. This may encourage farmers to take up the collection process.

3. Plant wheat early and use of early-maturing varieties

Early planting of wheat using early maturing varieties maximizes use of rain water; helps in early maturity and harvest of the crop; and prevents significant losses by the breaking cycle of the insect pest peak feeding and heading.

4. Harvest your crop early

The wheat crop should be harvested as soon as it reaches maturity or it will be prone to Sunn Pest damage.

5. Encourage natural enemies to Sunn Pest

Conservation and planting of shrubs, trees and flowering plants is recommended in the neighboring areas of wheat and barley fields, because they provide favorable habitat and food to the natural enemies of Sunn Pest, such as parasitoids and predators. The use of flowering medicinal plants is also recommended in the cropping system since they provide food for Sunn pest egg parasitoids.

Sunn pest egg parasitoid

Benificial insects attracted to a flowering medicinal plant

6. Inspect your field regularly

To monitor the wheat fields, a wooden frame of 0.5 x 0.5 m is used. Five blocks of about 2000 m² each are randomly selected every week. The frame is then randomly placed in five different areas. Then, the number of nymphs and adults of the Sunn Pest is recorded for each area. To calculate the total of Sunn Pest insects in the area (1ha), count the number of available nymphs and full insects captured, divide by 25 and multiply by four to estimate the number adults and nymphs per square meter. This data forms a good basis on which to plan Sunn Pest control.

7. Respect the economic threshold

The economic threshold is the population level of Sunn Pest at which the farmer needs to take action to avoid economic loss of their crop. At this population level, if the grower follows the recommended management strategy, they are expected to earn more from the crop than the cost of treatment. Thresholds for Sunn Pest control in Syria are: overwintered adults 3/ m², nymphs 8/m².

Air-spraying is not recommended.

8. Follow pesticide use and safety guidelines

1. Ground spraying of wheat fields is the most effective application method. Aerial spraying should be restricted to large areas or those in which ground application is difficult to apply.
2. Buy only the quantity of chemical insecticides that is needed for the current season.
3. Inspect and calibrate your sprayer on an annual basis. Fix it if needed.
4. Use proper protective clothes, including a mask and gloves during pesticides application.
5. Mix only what is needed and carefully follow safety instructions on the label.
6. Notify the apiculturist prior to spraying, and choose only low toxicity pesticides that are specifically targeted to the Sunn Pest.
7. Apply pesticides when the weather is relatively cool and calm.
8. Dispose of extra pesticides properly and store original containers according to labeling instructions.
9. Be sure to take a shower after each spraying.

[1] This refers to a number of species of the genera *Eurygaster* and *Aelia*

* The exact timing of the life cycle varies with the location and weather conditions

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