Wheat Stem Sawfly: *Cephus cinctus* Monitoring Protocol

Host Plants: Wild grasses are the primary host plants. Spring wheat and rye are the main cereals attacked.

Plant age is important to egg-laying females. Plants that have not reached the stem elongation stage are not acceptable to females. Similarly, plants in the boot stage are immune to sawfly attack.

Identification, Life Cycle and Damage:

Adult: The adult sawfly is wasp-like, slender, and about 8-13 mm long. The body colour is shiny-black, with 3 yellow bands on the abdomen (Figure 1). They have smoke-colored wings and yellow legs. **The adult emerges in June and can usually be found in wheat fields until mid-July.** Males emerge first; females emerge later. Adults have a habit of resting on the stems with head downward. During this time, the female inserts an egg into the elongating internode of a wheat stem. They use their saw like ovipositor to cut a slit in the plant to lay eggs.

When the weather is rainy in the fall or spring, the numbers of large, head-bearing stems of native grasses are adequate for sawfly populations. But when there is a drought, the numbers of grass stems suitable for attack are few and the sawfly concentrates its attack on wheat instead of on grasses.

Eggs: Eggs are crescent-shaped, glassy, milky white and about 1 mm long. The eggs will hatch in 5-8 days.

Larva: The mature larvae are dull-white, about 13-14 mm long, worm like and have a well-defined, brown head. The larva will assume an S-shape when extracted from the stem. Larvae feed within the stem until the plant is nearly mature (Figure 2). It then girdles the stem at ground level, plugs the pith cavity, and overwinters in the lower part of the stem (stub) enclosed in a long thin cocoon.

The sawfly larva bores down inside the stem and makes a discoloured tunnel from about the top joint to the root. Sometimes, however, eggs are laid above the top node of the plant and tunnelling by larvae destroys sufficient vascular tissue so that the head turns white.

Larvae feed within the stem reduce both yield (5 to 15 percent decrease in total seed weight) and quality of grain (from reduced protein and kernel weight). Drought conditions can reduce infestations in the following year by killing plants that have larvae inside them. Drought in the spring can cause overwintered larvae to re-enter diapause but the influence of this on population size is not clear.

Pupa: Overwintered larvae pupate in the spring. The pupal stage begins in mid- to late May and lasts about 10 days. Wheat stem sawfly has one generation per year.

Figure 1: Adult

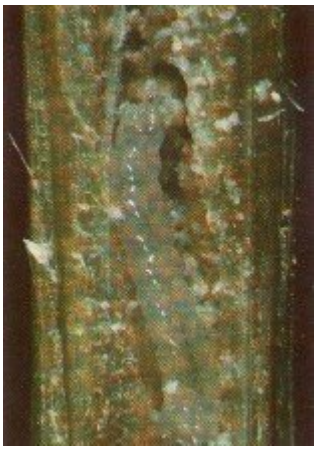

Figure 2: Larva

Monitoring

Sweep Net Counts for Adults:

Use a sweep net to sample for wheat stem sawfly. **When sweep net samples average 2 female sawflies per 10 sweeps, you can expect about 12% cut stems; 4 females per 10 sweeps cause about 23% cut stems.**

Determine the **percent of females found**. The female sawfly will have a distinct ovipositor used for inserting the eggs into the stem.

Site Selection for Damage symptoms:

The greatest losses occur around the margins of fields. During warm, sunny, windless weather, especially after rain, the sawflies disperse widely. Their attack is otherwise concentrated near the field margins**. Monitor prior to harvest**. Stems that contain a sawfly larva usually develop a reddish brown band below the second or third node. Determine **percentage of plants cut by sawfly larvae per square metre**. Control methods are required **if 10 to 15 per cent of the crop in the previous year was cut by sawfly.**

Procedure:

Walk about 50 m along field edge (or stubble crop interface), 5 m into the crop

Randomly place 1 m stick parallel along one row. Count **the number of long stems** cut by swather or combine and the **number of short stubs** cut by sawfly along the meter row. It is easier to find the stubs cut by the sawfly by feeling them with fingers. They are very close to the ground surface and are about ¾ inch long. On the same spot, count the number of heads on the ground between two rows along a 5 m stretch (5 paces OK). Repeat sampling about 100 m toward the middle of the field perpendicular to the edge (see the figure attached).

For fields not seeded in rows, use I m square quadrat to count the heads and one of the sides to count the stems harvested and those cut by the sawfly.