VI. Biology/Phenology

a. Biology

1. Pentatomidae on apple and pear

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**Phenology and development**: Stink bug populations were monitored in three geographic regions, Cashmere valley, Entiat valley and Manson. Native habitats and associated orchards within each area were sampled using a variety of different methods. Sweep sampling of some plants seemed to be appropriate but was not considered an acceptable means of collecting stink bugs in other habitats. Beating tray sampling worked well to sample stink bugs in bitterbrush habitats.

At least five known species of stink bugs were collected from different plants (Table 1). These species were most common in collections, but several other species that were less common have been submitted to experts for identification. Adult stink bugs were found in spring samples on wild rose, bitter and chokecherry, serviceberry and bitterbrush. They were also primary host plants associated with oviposition in the first generation. First through fifth instar nymphs were found on all these plants in early July. However, the number of stink bugs declined dramatically throughout June and July, possibly associated with natural mortality. As hillside host plants dried as the summer progressed, adults were concentrated on more succulent vegetation.

Table 1. Stink bug species collected from habitats in northcentral Washington, 1995

| Common name | Scientific name |
|---|---|
| Consperse stink bug | Euschistus conspersus |
| Redshouldered stink bug | Thyanta accerra |
| NONE | Chlorochroa sp. (two at least) |
| Green soldier bug | Acrosternum hilare |
| NONE (predacious species) | Brochymena sp. |

Stink bug eggs were found on the undersurface of the leaves of pear and apple orchards located near native habitats where stink bug adults were common during the spring. However, no nymphs were detected in the orchards throughout the summer, suggesting that apple and pear are not acceptable host plants or that sprays applied for pests eliminate stink bugs as well.

There was a second generation of most common stink bug species, a fact not considered common in WA. Eggs of the second generation were laid on a different group of host plants compared to the first generation. The second generation appeared to overlap with the first generation. The first eggs were found in late August.

During late June, July and August the most common host plants were brambles, thimbleberry, snowberry, sumac, poplar and common mullein. Stink bug densities were low on wild rose and uncommon on serviceberry and wild cherry in mid-summer.

**Biological control**: The only natural enemies of stink bugs discovered were egg parasites. At least two species of egg parasitoids were reared from natural collected stink bug egg masses, and these have been submitted to experts for identification. Most parasites were reared from eggs of Euschistus and Acrosternum. Egg masses obtained from colonies established in the laboratory were placed in the field, attached to native host plants, to determine the level of activity of parasites and to evaluate the methodology. Twenty-four such egg masses were placed in the field, and over

85% were found to be parasitized after recovery. Parasites from these samples have also been submitted for identification.

**Trap crops**: Less progress was made on this objective than was planned, primarily due to a late start in propagating plants and because of the time commitment associated with monitoring native habitats. The initial efforts on traps crops focused on the use of tomatoes planted around orchard perimeters. Tomato is known as a host for most species considered important in the region. Tomatoes in most sites did not grow well, in part because they were planted too late. Green beans and squash will be used as trap crops in addition to tomatoes in 1996. Native plants identified as key stink bug hosts will be considered as potential trap crops in 1996.

**Monitoring**: Assessment of stink bugs is a difficult and time consuming task. While useful in certain habitats and plant structure types, sweep nets and beating trays are not effective tools for sampling in orchards late in summer to detect immigration of stink bug adults. A commercially available attractant was evaluated as a monitoring tool in association with a live trap. The trap consisted of a one-gallon clear container with two openings. The openings had wire funnels extending into the container so that stink bug adults going into the trap could not find their way out, similar to a fish trap. Traps were placed at selected sites and monitored weekly. Most species of stink bug were captured in the traps, indicating that the attractant was not species specific. Literature suggests that the attractant used in the lure stimulated a response in males and females as well as immatures. It may be that the attractant could be used in other kinds of devices to detect stink bugs. It is also likely that other attractants might elucidate responses in stink bugs. Fruit volatiles under investigation by the USDA-ARS laboratory in Wenatchee might form a class of chemicals that would be attractants to stink bugs. This possibility will be examined in 1996 using a simple olfactory choice test.