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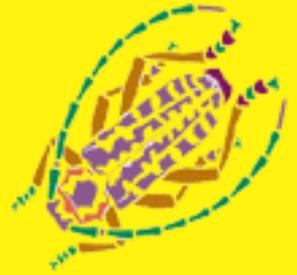
Kansas Insect Newsletter

For Agribusinesses, Applicators, Consultants, and Extension Personnel

Department of Entomology
239 West Waters Hall
K-State Research and Extension
Manhattan, KS 66506-4027

Tel: 785-532-5891

Fax: 785-532-6258



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WHERE ARE WE NOW?

European pine sawfly: Previously infested pines are good candidates for similar problems in ensuing years. Monitoring European pine sawfly activities can be done with relative ease by selecting a pine planting which was infested with EPS in 2003. Locate a terminal with egg-laden needles and tag it (Figure 1) with a twist-tie, piece of yarn, ribbon, etc. By tagging a terminal, a person can quickly locate and visually inspect the terminal to determine the EPS situation. Currently in the Manhattan area, egg development is underway as evidenced by their “growth” to the point that they have swelled and are exposed through parted needle tissue (Figure 2). Eggs are clear white (Figure 3) and have not yet developed to the blackhead (imminent hatching) stage.



Figure 1



Figure 2



Figure 3

Eastern tent caterpillar: In much the same manner as described for European pine sawfly, eastern tent caterpillar activities are easily monitored. Carefully examine the twigs of (especially) flowering crab trees which were infested with eastern tent caterpillar in 2003. Because (at this time) trees have yet to leaf out, egg masses are easily spotted on the bare twigs (Figure 4).



Figure 4

Mark/identify the egg masses thus facilitating the weekly inspection/monitoring process. In the spring, egg masses lose their shiny shellac-like protective covering (Figures 5 and 6), and individual eggs are easily observed (Figure 7). Currently in the Manhattan area, egg hatch has not yet begun.



Figure 5

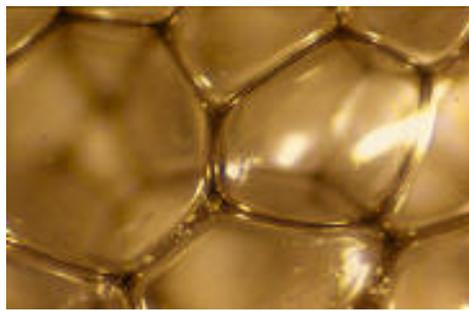


Figure 6



Figure 7

SCALES AND DORMANT OIL TREATMENTS:

Scales are basically divided into two main categories: hard scales and soft scales. Hard scales are housed beneath a scale cover (thus they also are referred to as armored scales) whereas soft scales have no protective structure. In general, hard scales overwinter as mature females and/or fall-laid eggs, whereas soft scales overwinter as immature females.

Most scale insects overwinter on the bark of twigs, branches or tree trunks. There are exceptions. In addition to overwintering on twigs and branches, *Euonymus* scale (Figure 8) also survive on the tops and bottoms of leaves. Pine needle scale overwinter exclusively on the needles (Figure 9).



Figure 8



Figure 9

Scale insects can be effectively controlled with spray treatments incorporating a horticultural oil. Modern-day horticultural oils are highly refined, and are therefore used as both dormant and in-season sprays. Because direct contact with oils is critical for treatment effectiveness, dormant oil treatments are applied to trees and shrubs prior to the production of current-season foliage. The advantage to dormant oil applications is achievable-thoroughness-of-coverage — that is, in the absence of leaves (which can intercept and deflect), scale insects are more exposed to spray droplets per se.

Although suffocation is a widely accepted concept to explain how oils kill target organisms, oils also penetrate cellular membranes causing protoplasmic disruptions resulting in cellular/organism death. While death may not be as rapid/instant as that achieved with synthetic insecticides, there are signs that oils-are-at-work.

Normal pine needle scales (PNS) have a “healthy white appearance (Figure 10). Within a week after treatment, their appearance drastically changes. The oil apparently alters the waxy make-up/structure of the scale cover rendering it transparent — the eggs and female scale beneath are visible (Figure 11). Upon flipping the scale cover, the eggs are darkened and clumped together (Figure 12), as opposed to healthy eggs which would appear bright pink and be free of each other. The female scale is also darkened/dead.

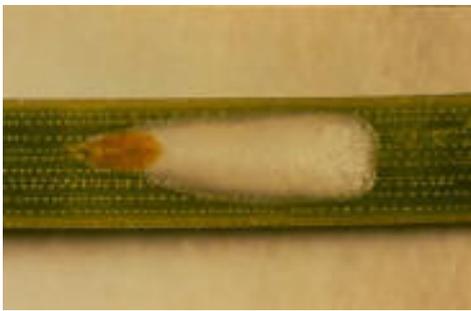


Figure 10



Figure 11



Figure 12

Similarly, pine tortoise scale (PTS) under go observable changes. Healthy pine tortoise scale are rather plump and brilliantly colored (Figure 13). Within a week after treatment, oils have rendered the scales darkened and shrunken (Figure 14), after which they eventually flake off (15).



Figure 13



Figure 14



Figure 15

To summarize, with oils, “What you spray is what you get”. There is no residual control once oil treatments have dried. Therefore the effectiveness of horticultural oils is reliant upon total spray coverage. The greatest

opportunity for achieving thorough coverage is to apply dormant oil treatments before the production of current-season foliage.

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Sincerely,

Robert J. Bauernfeind
Extension Specialist
Horticultural Entomology