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TOBACCO

THOUGHTS ON TOBACCO APHID MANAGEMENT
by Lee Townsend

Aphids held the #1 spot on the insect pest list across the tobacco-producing states during the 1980's. However, the introduction and widespread use of the systemic insecticides imidacloprid (Admire Pro), clothianidin (Belay), and thiamethoxam (Platinum) have provided effective preventive control that has pushed aphids out of the spotlight. With a high percentage of tobacco being treated with one of these three products, the potential for development of insecticide resistance becomes a concern.

All three are neonicotinoid insecticides so they share the same mode of action and belong to the same resistance management group (4). Consequently, aphids across the tobacco states have been exposed to this insecticide for many years. While there have been no confirmed reports of strong resistance of aphids to this insecticide group, research has shown variations in response in different aphid populations. This tells us that the potential for resistance to the neonicotinoid group should not be ignored.

Two strategies to reduce the potential for the development of resistance are 1) using cultural practices that do not favor the build-up of aphid numbers in fields and 2) rotating among insecticides with different modes of action for aphid control.

There are some cultural practices that affect aphid survival and buildup in fields. Incorporating them can help to limit aphid numbers in fields, reducing their economic impact, and lowering the potential for development of resistance.

1. Control aphids during transplant production. Start by eliminating plants around greenhouses and float beds that can provide overwintering sites for aphids – greens, wild mustard, dock, and other leafy greens. Infestations can develop later as side walls of float bed structures are raised to allow air circulation and to harden plants. This allows winged aphids to settle on plants and begin to reproduce. Sprays of Orthene or other acephate products can be used to control developing infestations during this period.

2. Use recommended nitrogen rates. Too much nitrogen fertilizer causes the leaves to remain green later in the year and it promotes excessive sucker growth that favors late aphid and hornworm infestations after topping.

3. Transplant early. Early planted tobacco generally has lower initial and total aphid numbers per plant because fewer wingless adults are flying then. Also, the crop matures earlier and aphids have less impact on it than tobacco set near the end of the recommended transplant window. Many more winged aphids move into late-set field resulting in

higher initial infestations and ultimately many more aphids per plant.

4. Top early and control suckers. Aphid populations often decline rapidly after topping, especially in hot, dry weather. However, aphids may still reach damaging levels that require insecticide treatment. Top in the button or early flower stage to eliminate food sources for budworms and to make the crop a less desirable host for aphids and hornworms.

Here are some points to consider when selecting insecticides for aphid control.

1) The preventive products Admire Pro, Belay, and Platinum are probably best suited for late-set fields where the potential for higher aphid infestations is greatest.

2) Admire Pro, Belay, and Platinum have the same mode of action. Rotation among them will not affect the development of resistance. The foliar insecticides Actara (thiamethoxam), Assail (acetamiprid), and Provado (imidacloprid), labeled for aphid control on tobacco, also belong to this group.

3) Acephate products (Othene, etc.) (Group 1) and Fulfill (pymetrozine) (Group 9) are insecticides with different modes of action that can be used as foliar sprays to control aphids.

It is fortunate that the neonicotinoid insecticides continue to perform well against aphids. Taking cultural control steps and using sound insecticide management strategies will help to prolong the effective life of the products that are available to us.

FRUIT CROPS

NEW DISCOVERY FOR GRAPE CROWN GALL BIOLOGICAL CONTROL
by John Hartman

Crown gall is especially devastating to grapes in Kentucky and some vineyards have been lost due to the disease. In grapes, *Vitis vinifera* cultivars are more susceptible to crown gall than *V. labrusca* cultivars.

Symptoms. The disease is characterized by galls or knobby overgrowths that form on susceptible plant tissues, generally on grape trunks (photo 1) at or above the graft unions. Galls are rarely observed on the roots, but roots may develop necrosis. New galls first appear in early summer as white, fleshy, callus growth. Galls turn brown by late summer and in the fall become dry and corky. The woody tumors may be gnarled with rough surfaces (photo 2). When galls are numerous they disrupt the translocation of water and mineral elements, leading to poor growth, gradual dieback, and sometimes death of vines. In general, affected plants are more susceptible to adverse environmental conditions, especially winter injury.

Cause and biology of the disease. Crown gall is caused by the soil-borne bacterium, *Agrobacterium vitis*, formerly thought to be a strain of *Agrobacterium tumefaciens*. The bacterium survives at low levels for long periods of time in soil, and also in galls and in diseased plants. The crown gall bacterium is widely present in Kentucky soils and may be systemically present in many grape vines, but the bacterium seldom causes disease unless the vine is injured. Galls develop following an injury to grape cells permitting entrance of the pathogen and systemic movement in the plant. Such injuries may occur during intermittent freezing and thawing weather common to Kentucky each winter. Overwintering bacteria may be spread to wound sites by splashing rain, running water, on cultivation implements or on

pruning tools. Contaminated nursery stock may be another source of the disease.

Biological control of crown gall (*A. tumefaciens*) on other crops has been achieved through application of antagonistic strains of related bacteria (*A. rhizogenes*, strain K84) which prevent the crown gall bacteria from causing disease. Recently researchers A. Kawaguchi, K. Inoue, and Y. Ichinose in Japan have expanded on this concept by using a non-pathogenic strain of A. vitis. The report appeared in a recent paper entitled: Biological Control of Crown Gall of Grapevine, Rose, and Tomato by Nonpathogenic *Agrobacterium vitis* Strain VAR03-1.

A nonpathogenic strain of *A. vitis* VAR03-1 was tested as a biological control agent for crown gall of grapevine (*Vitis vinifera*). When roots of grapevine were soaked in a cell suspension of antagonists before planting in soil infested with tumorigenic *A. vitis*, treatment with VAR03-1 significantly reduced the number of plants with tumors and disease severity. Moreover, VAR03-1 greatly controlled crown gall of grapevine due to tumorigenic *A. vitis* in the field. VAR03-1 established viable populations in the rhizosphere of grapevine and persisted on roots for 2 years.

This research is the first report that a nonpathogenic strain, VAR03-1, can effectively control crown gall caused by tumorigenic *A. vitis*. Thus, there is hope that in the future, a biological control product effective against grape crown gall will be developed and made available to Kentucky grape growers.

LIVESTOCK

CONTROLLING LICE ON BEEF CATTLE
by Lee Townsend

If cattle seem to be scratching excessively against

trees, posts, and feeders, to the point of rubbing off large patches of hair or creating raw sores, lice may be the reason. The species of biting and sucking lice that infest cattle are most numerous and active during the winter and can spread easily through the herd as cattle bunch in response to cold temperatures. Confirm that lice are the reason for the scratching by examining some animals in the herd. Part the animal's hair in spots where lice are likely to occur and look for lice eggs (nits) attached to hairs.

The single species of the biting louse on cattle is about 1/12 inch long with a yellow- white body and wide red head. It can be found all over the bodies of young and mature cattle. This louse feeds on skin, skin secretions, and hair and is irritating. There are three species of sucking lice; they are blood feeders. These lice are most commonly found on the head, neck, brisket, withers, around the base of the tail and along the inner surfaces of the legs. Shortnosed and little blue cattle lice are more often found on older animals, the little blue louse tends to occur on the head. The longnosed cattle louse is most often found on young cattle.

If lice are present, two insecticide applications may be needed to clean-up the infestation. The first treatment kills active adult and immature lice but does not kill nits or eggs on the hide. The second application, about 14 days later, targets newly hatched lice.

There are plenty of lice to go around. Different species also attack horses, goats, and swine. The signs and impact on these animals are very similar to what is seen on cattle, the control approach is similar, also.

LAWN & TURF

DATABASE ON CANCER RISKS OF TURF FUNGICIDES

by Paul Vincelli

The Cornell University Turfgrass Science program has partnered with Cornell's Program on Breast Cancer and Environmental Risk Factors to create a database that provides information on the cancer-causing potential of the fungicidal active ingredients used for turf disease control. This database reports the U.S. Environmental Protection Agency's classification of cancer risk for turf fungicides, and thus, it can be considered as an authoritative source of such information . The database can be found online at http://envirocancer.cornell.edu/turf/.

Users can easily use this database to search for the active ingredient(s) or by searching product names. The database only reports cancer risk classifications for the active ingredients, and not for the commercial products themselves, which also contain inert ingredients. Inert ingredients are not required to be reported publicly, and so cancer risk assessments of these are not included in this public database.

Keep in mind that cancer risk assessments don't tell you whether you, your co-workers, or users of turfgrass treated with commercial fungicides will actually develop cancer from using commercial fungicides. They only provide a reasoned scientific judgment of the expected cancer-causing potential of the active ingredients. Nevertheless, that information still will be of value to many in considering your turfgrass management program. More information on interpreting cancer risks is available at the website.

Below is the cancer risk classification for selected turfgrass fungicidal active ingredients, along with trade names of commercial products that contain those fungicides. I've only shown those fungicides for which the classification raises concern about potential carcinogenicity. Many other turf fungicidal active ingredients are included in the database, so interested readers can access the website directly to see cancer risk classifications of most fungicides in use in Kentucky.

US-EPA Cancer Risk Classifications of Selected Turf Fungicides

Boscalid (also known as *BAS 510*) (Emerald®): Suggestive Evidence of Carcinogenicity but not Sufficient to Assess Human Carcinogenic Potential

Captan (Captan®): Likely to be carcinogenic to humans following prolonged, high-level exposures causing cytotoxicity and regenerative cell hyperplasia in the proximal region of the small intestine (oral exposure) or the respiratory tract (inhalation exposure), but not likely to be a human carcinogen at dose levels that do not cause cytotoxicity and regenerative cell hyperplasia.

Chlorothalonil (Daconil®, Echo®, Manicure®, Chlorostar®, Concorde SST®, Pegasus L®): Known/Likely carcinogen

Ethazole (also known as *etridiazole*) (Koban®, Terrazole®): Group B2-Probable Human Carcinogen-Sufficient Evidence from Animal Studies

Iprodione (Chipco 26019, Chipco 26GT®, Proturf Fungicide X®, Iprodione Pro, Raven®): Likely to be Carcinogenic to Humans

Mancozeb (Fore®, Manzate 200®, Protect T/O®, Mancozeb®, Dithane®, Formec®, Pentathlon®): Group B2-Probable Human Carcinogen-Sufficient Evidence from Animal Studies

PCNB (Also known as *pentachloronitrobenzene*) (Defend®, Penstar®, Terraclor®, Turfcide®, Revere®): Group C-Possible Human Carcinogen

Propiconazole (Banner MAXX®, Propiconazole Pro®, Spectator®, Savvi®): Group C-Possible Human Carcinogen

Thiophanate methyl (Cleary's 3336 Plus®, Allban®, Fungo®, Proturf Systemic Fungicide®, Systec 1998®, Cavalier®, Absorb TM®, T-Storm®, Tee-Off®): Likely to be Carcinogenic in Humans

Triadimefon (Bayleton®, Proturf Fungicide VII®): Group C-Possible Human Carcinogen

Vinclozolin (Curalan®, Touché®, Vorlan®): Group C-Possible Human Carcinogen

HOUSEHOLD FIREWOOD INSECTS

by Lee Townsend

The main message for Kentuckians this winter – buy local firewood and don't bring firewood from other states. This is a major way that the emerald ash borer can be spread into new areas.

A variety of native creatures find Kentucky firewood a great place to live or hide for the winter. Consequently, it is easy to bring them indoors when stocking wood to burn. The warmth stirs them to activity and they can provide some temporary excitement but little in the way of problems. Firewood inhabitants usually belong to one of two groups: 1) shelter seekers and 2) wood-infesting insects.

Shelter Seekers

Many arthropods hide under loose bark or in cavities during the winter. Possibilities include beetles, wood cockroaches, and even overwintering wasp or hornet queens. Spiders and their egg sacks, praying mantid egg masses, and moth cocoons are part of the "life" that may be associated with trees or fallen logs. These creatures will become active after warming up indoors. They can be swatted and discarded as they appear. These insects are not able to survive for extended periods indoors and they will not multiply or become established in the home.

Wood Infesting Insects

Many insects attack stressed or dead trees. Their activities ensure that the resources in the wood are broken down and recycled. Beetles are the most common group found developing in firewood. These include roundheaded wood borers, flatheaded wood borers, and shothole borers, also called powderpost beetles. The legless, white larval stages of the first two types can be found while splitting logs. Piles of sawdust appear from small holes in logs infested by powderpost beetles. The potential for these insects to infest structural wood in the house is very low. Often these borers attack only certain types of wood and the moisture content must be much higher that than found in structural wood.

Sometimes adults emerge after logs are brought indoors. Roundheaded wood borers are brightly marked, fast beetles with long antennae. The elongate flatheaded woodborers often have a metallic sheen. Powderpost beetles are small, brown to black insects. Any of these may be seen crawling or flying in the room or accumulating at windows or light fixtures as they move to light. These insects are harmless. Carpenter ants and termites may also be found in firewood that has been wet or stacked in one place for a long time. Termite colonies are in the soil so only workers are found in the wood. Termites form mud tunnels and this mud can be found in wood that they are attacking. Carpenter ant galleries are very clean, with no mud or sawdust. Individuals brought into the house in logs will not start an infestation but a colony may exist in old wood piles outdoors.

Insect invasion of homes from firewood can be reduced by following these rules:

Inspect wood as you pick it up. Check surfaces that were on the ground or against other pieces. Brush off the creatures that you see and knock wood together to dislodge what you don't see.

Bring in small supplies that will be burned in a few days rather than large amounts that could stay in place for weeks.

Outdoors, avoid stacking the wood directly on the ground, especially right beside the foundation. This will keep it from getting too wet and reduce the chances for infestation by termites and ants.

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