

Number 10 - June 29, 2015

## **Crabapple Scab**

Apple Scab is an extremely common fungal disease of apple and crabapple caused by the pathogen *Venturia inaequalis*. In the past few weeks, I have observed symptoms progressing on several susceptible trees. Early symptoms of the disease appear as olive green spots on the foliage. The spots often form along or near the leaf veins, eventually developing a dark, velvety appearance. Infected leaves also may appear curled or puckered. By mid-summer, infected leaves turn yellow, and prematurely drop from the tree. Pre-mature defoliation results in aesthetically unpleasing, thin tree canopies. Defoliation also weakens the tree and may reduce bud development for the following year. Fruits are also commonly affected with symptoms of cracked, black, scabby lesions.

The pathogen overwinters on fallen diseased leaves and less significantly as fungal spores and mycelia on buds. Mild, rainy spring weather induces spore dispersal from fallen leaves which then cause primary infections. Wet periods, or time in which foliage remains continuously wet, are necessary for infections to take place. The period of time necessary for germination and infection is dependent on temperature. Primary infections can occur in as few as 6 hours with temperatures between 63°F and 75°F. Spores capable of causing secondary in-

fections are produced roughly 1-2 weeks following the initial infection.

Disease control should utilize multiple strategies. Host plant disease resistance is the most effective long-term control strategy. If you are planting new crabapples, look for varieties with resistance to scab as well as rust, fire blight, and powdery mildew which are all common diseases of crabapple.

Adequately spacing trees and pruning to improve air flow allow leaves to dry quickly after rains. The goal is to limit the period of time the leaves remain wet. Unfortunately, weather is the biggest factor, and least controllable.

Other control strategies target the fungal spores. Raking and destroying fallen leaves may reduce the amount of fungal spores present. Mulching mowers chop diseased leaves and encourage decomposition. Fall lawn fertilization further helps to decompose disease leaves.

Fungicide sprays are effective at protecting developing leaves on susceptible cultivars. It's too late to protect this year's foliage from infection. The first spray should be applied when leaves just begin to emerge from buds (about 1/4 inch green). Sprays must be continued according to label intervals until 2 weeks after petal fall to give maximum protection. If the tree is free of leaf spots at that point, further treatments are unnecessary.

Intervals between sprays depend on several factors. The product's label provides a range of days between sprays. The shortest labeled interval between sprays is recommended during periods of frequent wet weather and in plantings that had severe scab infections the previous growing season. A longer interval is acceptable during dry weather and in plantings where scab has been less of a problem. (*Travis Cleveland*)

### **Wet Weather Turf Pests**

The heavy rainfall this spring is conducive to high numbers of crayfish, millipedes, centipedes, sowbugs, springtails, fungus gnats, slugs, and earwigs. All of these animals are more numerous in areas with high amounts of dead organic matter and moisture. They will be more numerous in thatchy turf areas that are kept moist. Lawn care clients that overwater and insist on high fertilization will have more of these creatures than others. Core-aerification of turf along with appropriate fertilization and irrigation can reduce their numbers. Clients who mulch too deeply around trees and in landscape beds will also have more of these animals. Two to three inches or less of mulch is recommended. (*Phil Nixon*)

### **Millipedes**

Millipedes are elongated, many-legged, hard-shelled, brownish, slow-moving insect relatives that feed on decaying plant material in moist situations. They have two pairs of legs per segment, totaling over one hundred legs per animal. Common millipede species are one to

two inches long. In southern Illinois, there is a millipede that grows to six inches long. These large millipedes are commonly found under fallen logs in forested areas and are commonly kept as pets.

When very numerous, millipedes crawl out onto pavement, forming masses or rows of them on the march. On damp mornings, they crawl up the sides of buildings. As they die, they coil up. People commonly find them coiled up and dead in basements but they may survive in the high humidity of damp basements.

Homeowners that overwater heavily mulched ornamentals beds near foundations commonly find large numbers crawling on the sidewalk or patio. They tend to blame the lawn care applicator for the high numbers, but turf is usually not the cause unless it is overwatered.

Although they will feed on tender seedlings, millipedes are unlikely to feed heavily on older plants. Dead turf areas frequently contain very large numbers of them, causing them to be blamed at times for the damage when they have only moved in to feed of the decaying plants. Healthy turf typically contains numerous millipedes, so their migration into dieback areas can result in very high numbers very quickly.

Millipedes are apparently different enough in their physiology from insects that insecticide application results in very low, if any, mortality. Effective management relies on reducing dead organic matter and moisture. During rainy weather, patience and understanding is important. (*Phil Nixon*)

## Centipedes

Centipedes are also elongated like millipedes, but have only one pair of legs per segment and are fast-moving. They have one pair of obvious antennae. The last pair of legs are elongated and extend behind as they move.

Some centipedes are very slender, appearing almost like a thick thread with short to long legs depending on the species. They wind back and forth, making many tight turns as they run. Others are much thicker-bodied and generally have shorter legs. Most are yellow, tan, or dark brown in color. House centipedes are less common outdoors than in basements. They are purple with extremely long legs that allow them to run very fast.

Centipedes feed on insects and other small animals, particularly springtails and mites. They become numerous as prey increases. They are most common in damp areas and can build up to large numbers in thatch where they feed on insects and other small animals that feed on decaying plant material. Insecticide applications are not recommended to control beneficial animals outdoors such as centipedes. (*Phil Nixon*)

## Sowbugs

Sowbugs and pillbugs look like tiny armadillos and are commonly called roly-polies. Pillbugs roll up into a tight ball when disturbed. Sowbugs are flattened dorso-ventrally, with their upper surface consisting of wide plates connected by the underlying body. Sowbugs and pillbugs are crustaceans, being more closely related to crayfish and shrimp

than insects. As such, they have two pairs of antennae, gills under the carapace, and ten pairs of legs. Some species of sowbugs are aquatic, being common in streams and ponds.

They are occasionally found in dry soil but their gills require their periodic return to moist conditions. When present in large numbers, they sometimes feed on seedlings and soft leaves. They primarily feed on decaying plant material and will build up to large numbers in moist dead turf areas and around sprinkler heads.

Reduction of dead organic matter and reducing moisture are the main methods of managing sowbug numbers. Being crustaceans, insecticides are unlikely to be very effective. (*Phil Nixon*)

## Springtails

Springtails are tiny, jumping insects associated with turf, mulch, and nearby areas. Most species are one-sixteenth to one-eighth inch long, although there are some giants that approach one-quarter of an inch. They are particularly numerous in moist and wet areas. There are even aquatic species that live on the water surface.

Springtails are elongate, cylindrical insects with simple eyes and obvious antennae. Perhaps their most obvious trait is a slender, forked furcula that extends from the posterior end of the abdomen and is carried folded up under the abdomen. When disturbed, the furcula is released, striking the surface with enough force to send the springtail flying up into the air. Many springtails jump two to three inches into the air, a

considerable feat for such a small insect. Springtails also have a colophore which is a broad, tube-like organ extending downward from the front of the abdomen. It is probably used in maintaining a proper internal water balance.

Springtails not only live at the soil surface, but also several feet down. Different species live progressively deeper. Species that live just a few inches below the surface have a reduced furcula that is eventually lost in deeper-dwelling species. After all, being able to jump serves no purpose when surrounded by soil. Species that live deeper in the soil also do not have eyes.

Springtails have very tiny mouths and are unable to bite humans. Some people are apparently sensitive to their scale-like setae or hairs and develop irritated skin when springtails are numerous indoors.

Springtails are perhaps the most numerous insects in the world. Every cubic foot of soil from the poles to the tropics contains large numbers of them, with populations commonly estimated at 3000 per cubic foot. They feed on molds and mildews which require dead organic matter, and both springtails and fungi need high moisture levels. Their feeding on fungi has resulted in their consideration as natural control agents for *Pythium* and other destructive fungi. Springtails increase in number and become obvious when dead organic matter and moisture is abundant.

Springtails become abundant outdoors when turfgrass is over-fertilized, producing extra thatch, and is over-watered either by humans, rainfall, or both. Similarly, they become abundant in mulch when it is too wet for long periods. The

answer to reducing the springtails is reducing the fertilization and watering. Insecticide applications have little lasting effect as they kill exposed individuals but sprays do not penetrate very deeply into soil and decaying plant material where most springtails live. (*Phil Nixon*)

### **Fungus Gnats**

Dark winged fungus gnat larvae, Family Sciaridae, feed on decaying organic matter in the soil. When full grown, they are about 3/8 inch long, slender, wormlike, and clear with black head capsules. In very moist to wet conditions, they sometimes migrate in rope-like masses across turf or pavement to pupate. These masses are sometimes round and 2 to 6 inches across, or more commonly up to 2 inches wide and several inches long.

Fungus gnat larvae are more likely to be numerous in areas with an overabundance of water from rainfall or irrigation. Over-watering newly laid sod can result in large populations of these larvae eating young roots. Reducing irrigation will cause a reduction in the number of fungus gnat larvae and allow the sod to root. Fungus gnat larvae are not likely to cause any damage to established turf and can be ignored or washed away with heavy streams of water.

Fungus gnat adults are tiny, blackish flies that hover as large swarms that have been very common this year. These swarms are a couple of feet across and tend to hover over upright objects such as fence posts, shrubs, and peoples' heads. The swarms consist of males that form to attract females for mating. (*Phil Nixon*)

## Slugs

Slugs are shell-less snails that feed on dead organic matter in moist environments. They are soft-bodied with two pairs of tentacles. The upper, longer pair are optic tentacles with eyes on the tips. There is also a shorter pair near the ground that are sensory tentacles for feeling and smelling. Near the front of the body on the right side is a hole or slit called a pneumostome, which is the opening that leads to the slug's single lung. The largest structure is the foot, which runs the length of the slug. The underside of the foot is called the sole.

The gray garden slug is very common and about one inch long. Although called gray, they come in white, yellow, lavender, purple, or blackish with brown specks and mottled areas. A less common species in Illinois is the spotted garden slug, which can be seven inches long but is more commonly three to five inches in length. Although small individuals tend to be dark gray to black, large ones are yellow to brown with black mottling and three rows of black spots running down the posterior half of the body.

High moisture levels allow slugs to leave turf and mulched areas to climb on lawn furniture and up the sides of houses, particularly at night and on damp mornings. They leave slime trails wherever they go that glisten like silver ribbons in the morning sunlight. Slugs eat holes in the leaves of thin-leaved, shade-loving plants such as hosta, violets, and impatiens.

Slugs are most effectively controlled by reducing the amount of moisture or dead organic matter. They can be controlled with slug baits containing iron

phosphate (Sluggo, Escar-Go) or metaldehyde (Deadline). Iron phosphide baits are generally the best option as other slug baits are poisonous to dogs, cats, and other mammals. Copper strips that extend an inch or more below and above the soil line will keep out slugs. The copper apparently generates an electrical charge that is large enough to deter slugs.

Most other slug remedies are not reliably effective. The mucus that slugs produce allows them to cross a razor-blade edge without harm, making the use of sharp gravel, broken glass, and cinders of dubious value. Beer in shallow dishes is effective sometimes, although my experience is that this method allows the harvest of slugs but doesn't actually control them. Diatomaceous earth is not very effective in the damp environment that slugs inhabit. Salt, lime, and other chemicals may disrupt the soil's fertility until nothing will grow, which defeats the purpose. Because slugs and snails are mollusks (very distantly related to insects and other arthropods), insecticides are not effective. (*Phil Nixon*)

## Earwig

Earwigs are about five-eighths inch long and reddish-brown with large pincers called forceps protruding from the posterior end. These insects are turning from nymphs into adults at this time. As adults, they are much more active, becoming obvious in their activities. They are nocturnal insects, hiding in cracks and crevices during the day. They work their way into buildings as well. People commonly find them under damp clothes and along baseboards indoors as well as in crevices of outdoor furniture and play-

ground equipment. Landscapers notice them under loose pieces of bark.

Earwigs feed primarily on decaying organic matter and prefer moist locations. They will also feed on the leaves and flower petals of rose, daylily, dahlia, zinnia, and other flowers. They are commonly found hiding in the heads of lettuce and cabbage. They are also predators, feeding on adult fleas and other insects.

Earwigs can be controlled on foliage with carbaryl (Sevin) or pyrethroids. Do not spray blossoms. They can be kept out of houses with permethrin foundation sprays. The most effective control is to reduce the amount of moist, dead organic matter. *(Phil Nixon)*

### Modified Growing Degree Days (Base 50°F, March 1 through June 25)

Station Location	Actual Total	Historical Average (11 year)	One-Week Projection	Two-Week Projection
Freeport	1061	917	1217	1371
St. Charles	1056	865	1204	1353
DeKalb	1058	978	1217	1371
Monmouth	1220	1041	1378	1538
Peoria	1289	1095	1458	1629
Champaign	1347	1132	1520	1695
Springfield	1461	1222	1642	1829
Brownstown	1385	1298	1569	1759
Belleville	1544	1312	1726	1915
Rend Lake	1663	1421	1853	2049
Carbondale	1578	1342	1756	1941
Dixon Springs	1589	1414	1770	1957

Insect development is temperature dependent. We can use [degree days](#) to help predict insect emergence and activity. Home, Yard, and Garden readers can use the links below with the degree day accumulations above to determine what insect pests could be active in their area.

[GDD of Landscape Pests](#)  
[GDD of Conifer Pests](#)

Degree day accumulations calculated using the [Illinois IPM Degree-Day Calculator](#) (a project by the Department of Crop Sciences at the University of Illinois and the Illinois Water Survey). *(Kelly Estes)*

### Phenology Report for June 19, 2015

Several invasive plant experts from around the state are continuing their series of reports focusing on the phenology of invasive plants in Illinois. The intent of these reports is to provide an update on the development of invasive plants across the state of Illinois – what plants are in bloom, leafing out, setting seed, or senescing in different areas of the state.

Readers are encouraged to share what they see in their area of the state by emailing Chris Evans, Invasive Species Campaign Coordinator of the Illinois Wildlife Action Plan ([chris.evans@illinois.gov](mailto:chris.evans@illinois.gov)).

*(Contributors include Nick Seaton, Caleb Grantham, Eric Smith, Ryan Campbell, Tricia Bethke, and Mike Daab)*

*\*Report based upon observations between June 10-18, 2015*

### Southern Illinois

- [Multiflora rose, \*Rosa multiflora\*, bush honeysuckle, \*Lonicera maackii\*, and Autumn olive, \*Elaeagnus umbellata\*](#)- These common woody shrub species are all past bloom with green fruit that is starting to ripen. At this time, the plants are susceptible to herbicide treatments (both foliar and cut stump work at this time of year).
- [Garlic mustard, \*Alliaria petiolata\*](#) - This herbaceous woodland invader

is senescing and starting to drop mature seeds. Control at this time of year is not practical because of the risk to spreading seeds.

- **Sweet clover, *Melilotus sp.*** - Sweet clover, both yellow and white, are in full bloom throughout the region. Look for them along roadsides, in prairies, and other open areas
- **Sericea lespedeza, *Lespedeza cuneata*** - *Sericea lespedeza* is reaching its full height but is not in flower yet. Look for this species growing in open areas, prairies, pastures, and roadsides. Control is effective at this point through flowering.
- **Japanese stiltgrass, *Microstegium vimineum*** - This annual grass species is starting to put on a lot of growth but will not flower until near the end of summer. Germination is likely finished for the year so treatments can begin.
- **Poison hemlock, *Conium maculatum*** - This biennial member of the carrot family is past peak on blooming. Most plants are transitioning into seed production. Herbicide treatments are not likely to be effective at this point.
- **Reed Canarygrass, *Phalaris arundinacea*** - This perennial grass species is transitioning from flowering to mature seed. If control is desired at this time of year, the most productive method would be to mow the plants down (clean the equipment afterwards) and wait until the regrowth is 18-24" high before applying herbicide. Keep in mind that this species often grows in wet areas. If so, an aquatic-labelled herbicide should be used.
- **Crown vetch, *Securigera varia*** - This perennial herbaceous vine is in full bloom. You can find this plant along many roadsides in the region.
- **Chinese yam, *Dioscorea oppositifolia*** - This herbaceous perennial vine is growing rapidly. Look for the aerial tubers, called bulbils, to start to form at any point.
- **Teasel, *Dipsacus sp.*** - Both common and cutleaf teasel are bolting and initial flower heads are forming, though no flowers have been observed yet. Now is the perfect time to treat teasel with herbicides but once flowering has started, switch to hand-pulling. Mowing or cutting the flower heads off is not effective.
- **Mimosa, *Albizia julibrissin*, and rose of Sharon, *Hibiscus syriacus*** - both of these shrubs/trees are starting to flower right now. Look for them along roadsides and forest edges.
- **Common reed, *Phragmites australis*** - This huge grass species is growing very fast and starting to get very tall but flower formation has not been observed yet. The best time to treat this species is at the point of flower initiation.
- **Hedgeparsley, *Torilis sp.*** - This herbaceous member of the carrot family is just starting to bloom now. Hedgeparsley is a relatively new invader to southern Illinois but can be found along roadsides and other disturbed areas. It can grow in both sun and shade environments.
- **Johnsongrass, *Sorghum halepense*** - This state Noxious Weed is just starting to come into flower. Control is most effective on populations that are almost blooming, but treatments can still be made to populations in early flowering stages.

#### ***Central Illinois***

- **Sweet clover, *Melilotus sp.*** - Yellow sweet clover is in full bloom and white

sweet clover is just starting to bloom. Look for them along roadsides, in prairies, and other open areas.

- **[Dame's Rocket, \*Hesperis matronalis\*](#)** - This species is past peak of bloom. While some blooms can still be observed, plants mostly have seed pods on them at this point. Mechanical control (i.e. hand pulling) can still be effective though care needs to be taken not to spread the seeds.
- **[Poison hemlock, \*Conium maculatum\*](#)** and **[Wild parsnip, \*Pastinaca sativa\*](#)** - both of these biennial plants are in bloom right now, though moving towards past peak. While treatments can still be somewhat effective, the best timing is just before blooming.
- **[Teasel, \*Dipsacus sp.\*](#)** - Teasel is bolting right now but not forming flowers. This is the ideal time to treat teasel chemically.
- **[Canada thistle, \*Cirsium arvense\*](#)** - This perennial thistle is just starting to come into flower. Unlike most of the other thistles, this species can also spread via rhizomes.
- **[Reed canarygrass, \*Phalaris arundinacea\*](#)** - This perennial grass species seeds are starting to harden. If control is desired at this time of year, the most productive method would be to mow the plants down (clean the equipment afterwards) and wait until the regrowth is 18-24" high before applying herbicide. Keep in mind that this species often grows in wet areas. If so, an aquatic-labelled herbicide should be used.
- **[Crown vetch, \*Securigera varia\*](#)** and **[Birdsfoot trefoil, \*Lotus corniculatus\*](#)** - These two invasive members of the bean family are in full bloom. Look for them in open areas, such as roadsides and prairies.

## ***Northern Illinois***

- **[Wild parsnip, \*Pastinaca sativa\*](#)** - This biennial species is blooming, but past peak. Care should be taken to not expose your skin to wild parsnip sap, particularly in the presence of sunlight, as this can result in severe rashes and burns.
- **[Poison hemlock, \*Conium maculatum\*](#)** - This biennial invader of open lands is forming buds but not yet blooming. This is an ideal time to treat this species. Unlike wild parsnip, this species typically does not give you burns or rashes when it contacts your skin, but it is extremely poisonous if ingested.
- **[Multiflora rose, \*Rosa multiflora\*](#)** - This species is blooming but past peak flowering. At this time this species is susceptible to herbicide treatments (both foliar and cut stump work at this time of year)
- **[Bush honeysuckle, \*Lonicera maackii\*](#)** - This woody shrub is past flowering and beginning to set fruit, though the fruit are not ripe yet. At this time, this species is susceptible to herbicide treatments (both foliar and cut stump work at this time of year)
- **[Common buckthorn, \*Rhamnus cathartica\*](#)** - This woody shrub/small tree is past blooming but fruit have not yet formed. At this time, this species is susceptible to herbicide treatments (both foliar and cut stump work at this time of year)
- **[Crown vetch, \*Securigera varia\*](#)** and **[Birdsfoot trefoil, \*Lotus corniculatus\*](#)** - These two invasive members of the bean family are starting to bloom. Look for them in open areas, such as roadsides and prairies.
- **[Sweet clover, \*Melilotus sp.\*](#)** - Yellow sweet clover is blooming but white

sweet clover has not yet started to flower. Look for them along roadsides, in prairies, and other open areas.

- [Japanese knotweed, \*Fallopia japonica\*](#) - This aggressive herbaceous perennial is blooming. Even though flowers are present, seed viability is often low, and this species can be effectively controlled at this point.
- [Purple loosestrife, \*Lythrum salicaria\*](#) - This wetland invader is not yet blooming. While it can be hard to spot when it is not in flower, this is a great time to treat the species. When using chemical treatments, be sure to use an herbicide approved for use in aquatic situations.
- [Teasel, \*Dipsacus sp.\*](#) - Teasel is starting to bolt right now but not forming flowers. This is the ideal time to treat teasel chemically.
- [Yellow sweet flag iris, \*Iris pseudacorus\*](#) - This invasive iris is past flowering. Because this species often grows in wetlands, be sure to use an herbicide that is approved for use in aquatic situations when treating it.
- [Reed canarygrass, \*Phalaris arundinacea\*](#) - This species is in full flower. While pre-flowering and very early flowering are the best times to treat this species, effective control can be achieved at full flower. Once the flowers start to fade, consider mowing the grass and treating the regrowth.
- [Fig buttercup, \*Ficaria verna\*](#) - This species is starting to senesce. It is too late to do any management on this species for this growing season. The early phenology of this species causes it to directly compete with many of our spring ephemeral wildflowers.

## Illinois Invasive Species Symposium Recordings Now Available Online

Did you miss the Invasive Species Symposium in May? No worries! Recordings of these presentations are now online.

The all-day symposium featured 11 presentations on a wide range of invasive species topics and included the Illinois Invasive Species Awards Ceremony. (See the full agenda at <http://www.invasive.org/illinois/2015/illinoisinvasivespeciesSYMPOSIUMagenda.pdf>)

Over 100 people attended the symposium in person and over 50 signed onto watch the live webcast. A direct link to the recordings can be found here - <http://www.invasive.org/illinois/presentations.html>. (Kelly Estes)

## Invasive Species Spotlight: Spotted Lantern Fly

Today's global economy provides ever increasing opportunities for invasive pests to enter and exit our country. One recent and newsworthy example of such an accidental introduction is that of the spotted lanternfly (*Lycorma delicatula*), a planthopper (Hemiptera: Fulgoridae) native to Asia, being detected in Berks County, Pennsylvania in September of 2014. Thought to have arrived into the state via infested landscaping materials, the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) along with multiple state's departments of agriculture have worked vigorously to contain the pest within the Pennsylvania border, and to stop it from spreading into other states within the U.S.

Concern over spotted lanternfly stems from its potential to damage multiple valuable tree and fruit crops, including grapes, apples, ornamental trees, and pines. While adult lanternflies primarily reside and lay eggs on tree of heaven (*Ailanthus altissima*), immature lanternflies (nymphs) tend to feed upon many more plant varieties, and cause damage to plants by feeding upon the sap of stems and leaves. The fact that humans have the potential to unknowingly aid in the dispersal of the pest by long distance travel of materials and vehicles infested with the pest's egg masses, spotted lanternfly could pose a serious threat to our country's grape, orchard and logging industries. Within Illinois, emphasis has been placed on the pest's potential impact on grape vineyards if it were to expand its range into the state.

One can best help combat and slow the spread of spotted lanternfly by first properly identifying the pest. Lanternfly egg masses are laid in groups of 30-50 and covered by a brown yellow wax deposit. Immature spotted lanternflies (nymphs) are black with white spots, and develop red spots on their wing

pads and thorax as they mature. Adult spotted lanternflies are present from July into November, and feed predominantly upon Tree of Heaven (*Ailanthus altissima*) and grape vines. At rest, adults display forewings that are light brown with black spots at the front and a speckled band at the rear that are held above their body in a "tent-like" manner. When disturbed, adults lift their forewings to expose hind wings which are scarlet with black spots at the front and with white and black bars at the rear. In addition, adults have yellow abdomens with black horizontal bars and are typically 1 inch long and 0.5 inches wide.

Though currently only found in Pennsylvania, this is an invasive that is a concern for Illinois. If you suspect spotted lanternfly is your area, please contact Illinois' Agricultural Pest Survey Coordinator Kelly Estes ([kcook8@illinois.edu](mailto:kcook8@illinois.edu)) at 217-333-1005. Adult, nymph, or egg samples (placed in alcohol or hand sanitizer in a leak proof container) can be sent to 1816 South Oak Street, Champaign, IL 61820 for proper identification. (*Gabe Foote (CAPS intern), Kelly Estes*)