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University of Kentucky – College of Agriculture

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KENTUCKY PEST NEWS

ENTOMOLOGY • PLANT PATHOLOGY • WEED SCIENCE
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WATCH FOR:
COMMON OAK MOTH caterpillars and MAY beetles feeding on oaks; PAPER WASPS establishing nests under eaves; CEREAL LEAF BEETLES begin to feed; COLORADO POTATO BEETLES are leaving overwintering sites for potatoes and related plants; EUROPEAN PINE SAWFLY larvae feeding on conifers; IMPORTED CABBAGEWORMS on cole crops; STALK BORER damage appears along field borders; PINE NEEDLE SCALE and EUONYMUS SCALE crawlers active soon.

ARMYWORMS

ARMYWORM CATERPILLARS REPORTED; MOTH CAPTURE DECLINES IN PRINCETON BUT INCREASES IN LEXINGTON!
by Doug Johnson, Extension Entomologist

On Friday May 2, 2008, Jonathan Sant, Pioneer Inc., reported armyworm caterpillars in corn on a client's farm that lies between Arlington and Bardwell in Carlisle Co. KY. The worms ranged in size from very small (<1/4") to about ½" in length. The population was not yet overwhelming but the caterpillars were "easy to find". This is a no-till field of corn, not into sod but into (burned down) weeds, most of which were grasses. My thanks go to Jonathan for this report.

I believe this marks the early edge of the armyworm caterpillar population. You may notice that the date of this report is earlier than the dates I have used in my predictions. (See: KY Pest News No. 1158, April 21, 2008; No. 1159, April 28, 2008 at: http://www.uky.edu/Ag/kpn/kpnhome.htm). There are two reasons for this. First, I have only made predictions on caterpillars based on the dates of the largest moth flights (the last two weeks) but armyworm moths have been flying in small numbers since late March. Just lately they started a rapid increase to the current record setting numbers. Secondly, the area of this field is likely warmer than the Princeton trap site. The larvae are small and their appearance is early. My guess is that this represents a very early edge of the caterpillar population curve.

Ms. Patty Lucas has just confirmed the captures in Princeton for this week (ending Friday 02 May 08) at 195 moths / trap-week. This is down from 600 moths / trap-week, for last week (ending Friday 25 Apr. 08). So it appears that we have reached and passed our first generation peak flight in Princeton.

This may not be the case in Lexington. Ms. Susan Moser has reported 1,011 moths / trap-week captured in the week ending 02 May 2008 in the Spindletop farm trap. Although we have only one previous year of data from Lexington, this is almost twice as many moths as we have ever captured at any site in any year in Kentucky.

See a graphic representation of moth flight at:
http://www.uky.edu/Ag/IPMPrinceton/counts/taw/tawgraph.htm
NOTE: Because of the very large number of moths captured the scale on the graphs has changed.

The mere presence of worms does not warrant control. Although the moth counts are very large, there are several other factors that may affect the populations of the damaging caterpillar stage. Both eggs and caterpillars

may be eaten by predators, parasitized by wasps and flies, or infected by pathogens. It does, nevertheless, indicate a need to watch the situation carefully. Dr. Ric Bessin put a piece concerning armyworms in corn in Kentucky Pest News this past week (No.1159, April 28, 2008). I have a companion piece on small grains in the same issue. To review them go here:

http://www.uky.edu/Ag/kpn/kpnhome.htm

Degree Day Model Predictions for Princeton - Our graph shows us that the steep increase in moth capture occurred in the week ending March 28. Using that a as a starting point, caterpillars should begin appearing about May 12. Additionally, the peak moth capture is during the week ending May 2nd. Using the same model caterpillars from those moths should be evident about May 24th. **REMEMBER there were moths flying in low numbers before these dates!** Additionally, the model uses 2008 temperatures for dates that have passed, but five year average temperatures for dates in the future. The data is based on the Princeton weather station. Warmer locations would be earlier, with cooler locations later. This and all models have error associated with them. They are only estimators based on general conditions. Since we already know that caterpillars are present in corn in Carlisle county, KY, I suggest that producers, consultants etc., should be especially watchful for this pest over the next month.

Insect descriptions, scouting information, and insect management options are available here:

- IPM Scout Manuals
  http://www.uky.edu/Ag/IPM/manuals.htm
- Armyworms in Corn
  http://www.ca.uky.edu/entomology/entfacts/entfactpdf/ef109.pdf
- Armyworms in Small Grains
  http://www.ca.uky.edu/entomology/entfacts/entfactpdf/ef111.pdf
- 2008 Insecticide Recommendations
  http://pest.ca.uky.edu/EXT/Recs/welcomerecs.html

Again, armyworm is a general "grass loving" insect. Corn, small grains and pasture / hay grasses, in fact any grass crop, should be monitored closely.

TOBACCO

DISEASE UPDATE
by Kenny Seebold

As of May 5, 2008, no new cases of blue mold have been reported in the United States. Conditions were not favorable last week for transport of inoculum from the two known sources (Cuba and north-central Florida) into our production area. The threat to tobacco in KY is low at this time, according to the North American Plant Disease Forecast Center (www.ces.ncsu.edu/depts/pp/bluemold).

For up-to-date reports on the status of blue mold and other tobacco disease information, check the KY Blue Mold Warning System online at www.uky.edu/Agriculture/kpn/kyblue/kyblue.htm.

PASTURE GRASSES

ERGOT RISKS IN TALL FESCUE
by Paul Vincelli

The ergot fungus, *Claviceps purpurea*, is a widespread fungus that attacks the flowers of a number of grass species. The ergot fungus infects only the flower parts of certain grasses, and replaces the seed with "ergots". Ergots are survival bodies of the fungus that are easily recognized with the naked eye. They look like dark brown to black, curved miniature cigars measuring 1/8 inch to 3/8 inch. They are longer than grass seed, so they stick out beyond the glumes (Figure 1). If you cut them open, you'll see that they have a gray to whitish interior. These ergots will be evident as the seedheads approach maturity. Tall fescue is commonly affected in Kentucky, though other grass species may also be attacked.

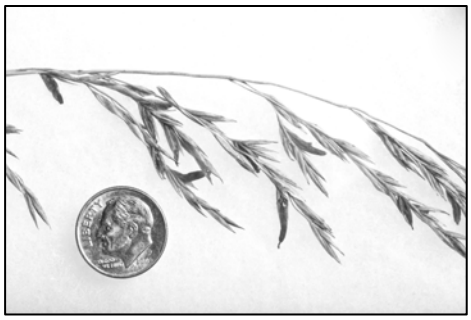


Figure 1- Ergot sclerotia in seedhead of tall fescue. (Photo by Steve Patton

C. purpurea is related to the fungal endophyte of tall fescue, and both are capable of producing potent toxic alkaloids that affect animal health (and human health, if eaten). This is not a trivial issue; I once was subpoenaed to give a deposition in a case in Kentucky with economic losses of over $2 million, in which ergot was implicated as the cause. And in the past few weeks, there was a case of poisoning of livestock in Wisconsin when bedding composed of ergot-contaminated tall fescue seed hulls was used.

Management
Preventing livestock from consuming a significant dose of ergot sclerotia is the only reasonable course of action.

- **Pasture**
  If seedheads form, inspect them for ergots. If they are

found, mow before turning livestock out into the pasture. Mow the seedheads along the fencerow, as well.

- **Hay**
  If the seedheads are dry before harvesting, the ergots will often fall to the ground during cutting/tedding/baling. However, if the seedheads were still somewhat green when cut, the ergots can remain attached to the seedhead, and will end up in the bale. In harvested hay, ergots constitute a very small fraction of the total forage in the bale. Because of this, the risk from feeding these bales is low. However, repeated feeding of infested hay into a feedbunk can lead to accumulation of the ergots at the bottom of the bunk. Livestock may then consume a high dose of ergots when they feed on this residue.

- **Seed Production**
  Where tall fescue is being grown for seed, avoid exposing livestock to the screenings and seed hulls, as these may be contaminated with ergots. Seed-cleaning operations concentrate the ergots and can pose a great hazard if livestock consume them.

VEGETABLES

BACTERIAL SPOT OF PEPPER REPORTED
by Kenny Seebold

The first case of bacterial spot of pepper for 2008 came into the Plant Disease Diagnostic Lab in Princeton recently. Bacterial spot is the most important disease of peppers grown in Kentucky, so this week we'll take a quick look at the biology, epidemiology, and management of this perennial problem.

Symptoms. Bacterial spot can affect seedlings in the greenhouse and field-set plants. Symptoms of the disease may be found on all parts of the pepper plant; however, leaves and fruit are most commonly affected. On leaves, lesions initially appear as yellow-green to brown, water-soaked spots. The center of the lesion eventually becomes necrotic and sunken on the upper leaf surface and slightly raised on the lower surface. Often, the center will fall out of the lesion, giving the leaf a "shot-hole" appearance. Lesions may also coalesce, or join, to form large necrotic areas along veins and leaf margins. Symptomatic leaves will eventually turn yellow and drop, exposing fruit to direct sunlight. This in turn results in high levels of sun scald that renders the fruit unmarketable. Under severe conditions, plants are killed. On fruit, first symptoms of bacterial spot are round, green, raised spots. The spots turn brown and take on a cankerous, cracked appearance and result in unmarketable fruit.

Biology and Epidemiology. There are 11 known races of the bacterial spot pathogen, *Xanthomonas campestris* pv. *vesicatoria* (XCV). The primary means of survival and spread is on infested seed, where the pathogen has been reported to persist as long as 10 years. Long distance movement can take place on seed or on infected transplants. The pathogen can also survive between pepper crops on debris (up to 6 months), on Solanaceous weeds (nightshade, groundcherry, for example), and on related crops like tomato.

Warm temperatures, high humidity, and precipitation favor development and spread of bacterial spot. Wind and rain will disperse XCV in the field, as will human and insect activity. In greenhouses, the pathogen is spread by contact and water splash, resulting in rapid progress of disease. The pathogen enters plant parts through wounds made by insects or by handling, or through natural plant openings such as stomata and lenticels. Disease progresses rapidly after XCV enters the plant.

Management. Prevention is the most important step in managing bacterial spot on pepper. Use certified, pathogen-free seed and transplants. Seed can be treated with hot water or with a bleach solution to eradicate XCV and other seedborne pathogens. A description of this procedure can be found at http://vegetablemdonline.ppath.cornell.edu/factsheets/Pepper_BactSpot.htm, as well as in the U.K. Cooperative Extension Service publication ID-36, "2008-2009 Vegetable Production Guide for Commercial Growers". Follow good sanitary practices in the greenhouse and field, making sure that tools and implements are cleaned with thoroughly with a 10% solution of household bleach. In the field, avoid handling plants and working the crop while foliage is wet.

Crop rotation is extremely important – never grow pepper after pepper, tomato, potato, or eggplant. Rotations of 2-3 years away from crops susceptible to bacterial spot can be very effective in reducing disease severity down the road. Also, keep fields and field borders as weed-free as possible to eliminate potential reservoirs of inoculum.

Pepper varieties with resistance to bacterial spot (usually races 1, 2, and 3, and sometimes other races) are commercially available and should be used. Refer to ID-36 for a listing of bacterial spot-resistant pepper varieties.

Chemical control options for bacterial spot are limited. In the greenhouse, seedlings can be treated at weekly intervals with a tank-mix of fixed copper and maneb. Transplants can be treated with streptomycin (Agri-Mycin or Firewall) at 200 ppm prior to transplanting. Streptomycin

is not labeled for greenhouse use, but can be applied to outdoor plant beds and to transplants held outdoors.

Fixed coppers, such as Kocide, Champ, or Badge, are labeled and should be incorporated into a disease management program as early as possible in the field. Tank-mixing copper with maneb will improve the efficacy of the copper against XCV. Apply these materials on a 7-10 day schedule, shortening the interval to 7 days if rainy conditions prevail. Even if bacterial spot-resistant peppers are planted, copper + maneb sprays should be part of the disease management program. Why? Because resistant varieties still develop disease, albeit at a lower level than bacterial spot-susceptible varieties. Copper + maneb also protects resistant varieties against races of XCV not affected by the varieties' genetics. Usually, spray schedules can be stretched to 10-14 days when bacterial spot-resistant varieties are planted.

Tanos, a fungicide available from DuPont, has been shown in Florida to reduce bacterial spot as well as several fungal diseases. The application rate is 8-10 oz/A (72 oz product/season maximum). Tanos must be tank-mixed with copper or maneb. We have little experience with this product in Kentucky and cannot attest to any additional benefits beyond those that would be achieved with copper plus maneb alone.

TIMBER ROT OF TOMATO
by Kenny Seebold

Our diagnostic labs in Princeton and Lexington have reported a few cases of timber rot, caused by the fungus *Sclerotinia sclerotiorum*. As of late, conditions have been favorable for timber rot, and we may see more cases in the coming weeks.

We typically see timber rot right around flowering, although the disease may affect younger plants (including transplants). The disease is more common in cool, wet conditions. Initial infections can occur on lower stems, stem joints, or leaf axils. Infected tissue will appear water-soaked at first, but will later turn tan-brown and have a bleached appearance (and possibly zones of alternating light and darker tissue). The whole plant will eventually wilt and die – often the symptom that first catches a grower's eye. *Sclerotinia sclerotiorum* produces signs that can be useful diagnostic aids. Under moist conditions, a fluffy white mycelium may be present. Hard black sclerotia will form in abundance on this mycelium in 7-10 days, and can be found inside the stem by splitting it longitudinally. Sclerotia are the primary source of inoculum for timber rot and can persist for a number of years in soil. A significant period of cool weather is necessary after formation of sclerotia before they will produce ascospores; therefore, sclerotia formed in one year normally are the primary inoculum for an outbreak in the following year.

Initial infections almost always arise from ascospores that have been released in the spring from fruiting bodies, or apothecia, produced on sclerotia on or in the top 2-3 cm of soil. This normally occurs when temperatures are between 50-60 °F. Thus, the window of time for which infective spores are present is relatively short. What's more, ascospores require 16-72 hours of continuous moisture to infect, and usually need to grow first on an external source of energy, such as senescent flowers or leaves, or damaged tissue.

No fungicides are labeled in Kentucky for control of timber rot, so cultural practices are our only means of managing this disease. Removing and disposing of infected plants and deep turning of fields will significantly reduce the amount of sclerotia in soils. Crop rotation can also be effective. Care should be taken in choosing rotational crops, as *S. sclerotiorum* has a wide host range that includes crops commonly cultivated in Kentucky. Tobacco growers should note that cull piles where infected transplants are dumped should be kept at least 100 yards away from tomato fields to minimize the chance of spread into fields. Proper row and plant spacing will also improve airflow and minimize favorable conditions for disease development. A commercially available biological agent, Contans®, can be applied to soil prior to transplanting. Contans® is a preparation of the fungus *Coniothyrium minitans* that specifically parasitizes sclerotia of *Sclerotinia sclerotiorum* and is purported to reduce their numbers in infested soils. This material has not been tested by our group on tomato, however, so we have no data to support the claims on the product label.

SHADE TREES & ORNAMENTALS

SPRINGTIME DISEASES IN THE LANDSCAPE
by John Hartman

Periodic rainy days and nights have been occurring almost weekly in Kentucky during April and early May. Wet weather leading to prolonged leaf wetness as new foliage is emerging is very favorable for many landscape tree diseases. Symptoms of scab, rust, and anthracnose diseases are already beginning to appear in many landscapes.

Apple scab. Unsprayed, susceptible flowering crabapples and some backyard apples are already showing symptoms of leaf infections by the scab fungus, *Venturia inaequalis*. Long (15-18 hours) periods of leaf wetness last Friday and Saturday, May 2-3 were favorable for new

apple scab infections in many parts of the state. If trees were not already infected, expect symptoms developing from recent infections to appear in 10-12 days. Symptoms already visible cannot be cured, even with eradicant fungicides such as Immunox.

Cedar apple rust and cedar quince rust. The causal fungi, *Gymnosporangium juniperi-virginianae* and *Gymnosporangium clavipes* are still active on infected cedar trees. Symptoms on flowering crabapple and apple are already visible in some locations.

Fire blight (*Erwinia amylovora*). The primary infection season on flowering pears and crabapples and backyard apples and pears is over since most blooms have dropped flower petals by now. Depending on location, landscapes in Kentucky were exposed to one or two fire blight primary infection periods based on favorable weather conditions this spring. If fire blight infections occurred earlier this season, symptoms in the fruiting spurs should be visible now. Look for blossom blight symptoms in the form of blackened, dead fruitlets in the fruit spurs throughout the tree. If there are not too many of them, infected clusters can be broken out by hand. Shoot blight symptoms, if they are going to occur, will appear in the coming weeks.

Anthracnose diseases. Symptoms of ash anthracnose, caused by a species of *Discula*, are visible in some parts of Kentucky now in the form of falling leaflets with brown blotches on the leaves. Where cool, rainy weather has prevailed, it is likely that sycamore (*Apiognomonia veneta*), oak (*Apiognomonia quercina*), maple (*Discula* sp. or *Kabatiella apocrypta*), and dogwood (*Discula destructiva*) anthracnose diseases are also active.

Kentucky growers and gardeners have some options besides fungicide application for growing and maintaining healthy landscape trees. Good growing practices are important in reducing the effects of springtime diseases. Consider the following:

- Rake up and compost fallen leaves. Leaves can be a source of inoculum.
- Prune out and destroy dead twigs and branches, because for many diseases branches harbor inoculum. Prune out cedar infections to break the cycle of rust disease.
- Select planting sites with a sunny eastern exposure to promote rapid foliage drying early in the day and prune to enhance ventilation and sunlight exposure within the canopy.
- Maintain tree health with proper watering and mulch over the roots but not against the trunk.

BORER ALERT
by Mike Potter

Four serious pests of landscape trees – dogwood borer, bronze birch borer, flatheaded appletree borer, and honeylocust borer – soon will be emerging. The dogwood borer is the most serious pest of ornamental dogwoods, especially stressed trees in full sun. The bronze birch borer is a severe pest of white or paper birch, especially cultivated trees under stress. Flatheaded appletree borers are major pests of red maples, hawthorns, flowering crabapple, and several other hardwoods, especially those which are newly transplanted or under stress. Honeylocust borers are serious pests of transplanted and established urban trees with limited root zones. Mated females of all four species fly to host trees and lay eggs on the bark.

Management -- Borers rarely injure healthy trees or shrubs growing in their natural environments. When transplanted into landscape settings, every effort should be made to minimize plant stresses such as drought, soil compaction, sun scald, lawn mower/weed trimmer injuries, etc. Because newly planted trees are under considerable stress, preventive sprays are advisable during the first 2-3 growing seasons after planting. Timing is crucial in order to have a lethal residue of insecticide on the bark to intercept newly-hatched larvae before they burrow into the tree. *Mid-May is about the time to apply protectant sprays for all four species.* Dursban (chlorpyrifos) and Lindane are no longer available, but professionals can use Onyx (bifenthrin) or Astro (permethrin). Homeowners should look for insecticides labeled for tree and shrub treatment containing similar active ingredients (e.g., bifenthrin, permethrin, cyfluthrin), marketed by Ortho, Bayer, etc. Susceptible trees should be sprayed to runoff on the trunk and main scaffold limbs. A second application, three weeks after the first, provides extended protection.

For further information, see entomology extension publication, ENT-43: *Insect Borers of Trees and Shrubs*.

MAPLE PETIOLE BORER AND LEAF DROP
by Lee Townsend

Petiole boring by a small wasp larvae may cause sudden drop of many sugar maple leaves may during May. Infested leaf stems usually break at a darkened area near the leaf blade. Usually infestations are limited to sugar maples and only about 25% to 30% of the leaves fall to the ground. While spectacular, the leaf drop has little effect on tree health. Buildups of scales or aphids, or drought stress can cause leaf loss but these typically occur later in the year. Leaf drop due to borers is seen earlier in the season and the leaf blades may still be green. Leaves from

trees stressed by sucking insects or drought usually have turned yellow before they drop. Splitting the petiole carefully near the leaf blade should reveal the larva or the tunnel.

There is one generation each year. Infestations begin as the adults, small wasps about 1/6" long, appear in May and lay their eggs in petioles near the leaf blades. Legless, white grubs with distinct light brown heads hatch from the eggs and tunnel inside the leaf stem for 20 to 30 days. The weakened stem breaks and the leaf floats to the ground.

The borer larvae generally remain in the portion of the stem left on the tree. About 10 days after leaf drop, the rest of the stem falls to the ground. The mature larva, about 1/3" long, leaves the stem through a hole in the side and burrows into the soil. It will change to the pupal stage and remain in the soil until the following spring.

Maple petiole borer infestations are infrequent and unpredictable. Also they do not appear to harm tree health so insecticidal control is not recommended. In addition, probably preventive treatments, applied well before leaf drop, would be necessary. It may be possible to reduce future infestations by picking up and destroying infested stems, the short sections without leaves, about 7 to 10 days after the first leaves fall. This sanitation program needs to be continued throughout the leaf drop period and must include all infested trees in the vicinity to be most successful. Raking and disposing of the leaves will not reduce the population because the insects are not in that portion.

PESTS OF HUMANS

WEST NILE VIRUS
by Lee Townsend

The 2008 West Nile virus - mosquito season is underway. According to data on the CDC web site as of April 8, 2008, bird, mosquito, or animal infections have been reported from California and Alabama. Single human cases have been reported from Arizona, Mississippi, and Tennessee.

West Nile virus is established as a seasonal epidemic disease in North America that flares up in the summer and continues into the fall. WNV affects the central nervous system. Most people exposed will not show any symptoms. However, mild symptoms may include slight fever and/or headache, possibly with skin rash and swollen lymph glands. A rapid onset of high fever with head and body aches, neck stiffness, disorientation, stupor and muscle weakness marks more severe infections. Those who may be most at risk are persons over the age of 50 and those with compromised immune systems.

According to the Centers for Disease Control (CDC) less than 1 percent of the people infected with the disease develop a serious illness, about 20 percent display mild symptoms and 80 percent will not show any symptoms.

There has been a dramatic decrease in Kentucky cases since the 2002 outbreak year. Below is a summary of West Nile virus activity in Kentucky from 2002 (peak) and the past two years. These data came from the Ky Cabinet for Health Services, Dept of Public Health and are available at http://chfs.ky.gov/dph/epi/westnile.htm.

Positives	2002	2006	2007
Horses	513 (78)*	18 (12)	5 (5)
Birds	603 (101)	8 (7)	6 (4)
Humans cases	75 (32)	6 (4)	3 (3)

*# cases (# counties)

The keys to reducing the risk of mosquito-borne diseases are
1) use mosquito repellent
2) reduce mosquito breeding sites in your area
3) install or repair window and door screens, and
4) support community-based mosquito control programs.

DIAGNOSTIC LAB-HIGHLIGHTS
by Julie Beale and Paul Bachi

During the past week, the PDDL received samples of Septoria leaf blotch and nitrogen deficiency on wheat; and cold injury and slow germination/stunting from adverse conditions in the float bed on tobacco seedlings.

On fruit, vegetable and herb samples, we diagnosed cane blight on blackberry; leaf curl on peach; Sclerotinia ("lettuce drop") on lettuce; bacterial spot on pepper; Pythium root rot, Sclerotinia stem rot and cold injury on tomato; spider mite injury on basil; Sclerotinia stem rot on feverfew; and Pythium root rot on oregano, rosemary and sage.

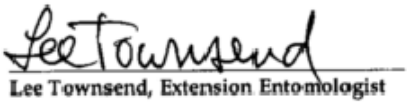
On ornamentals, we have seen tobacco rattle virus on bleeding heart (*Dicentra*); Pythium root rot on containerized hydrangea; Phytophthora blight on peony; Cercospora leaf spot and spider mite injury on verbena; black spot on rose; winter drying on magnolia and rhododendron; freeze injury (from April '07) on elm and hornbeam; and Rhizosphaera needle cast, spider mite injury and general decline symptoms on spruce.

INSECT TRAP COUNTS
April 18-25, 2008

►***Princeton, KY***
Black cutworm....1
True armyworm....195
Corn earworm....2
European corn borer....0
Southwestern corn borer....0
Fall armyworm....0

►***Lexington, KY***
Black cutworm....6
True armyworm....1011
Corn earworm....0
European corn borer....0
Southwestern corn borer....0
Fall armyworm....0

Graphs of insect trap counts are available on the IPM web site at -http://www.uky.edu/Ag/IPM/ipm.htm.
View trap counts for Fulton County, Kentucky at - http://ces.ca.uky.edu/fulton/anr/



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