Cooperative Extension: Colorado State University, Fort Collins, Colorado 80523

Pest Alert

Vol. 16 No. 3 April 30, 1999

SPIDER IDENTIFICATION CLASSES BEING OFFERED

Want to learn more about spiders and/or help with a state spider survey?

Dr. Paula Cushing is the new Curator of Entomology at the Denver Museum of Natural History. She is pursuing lots of different projects but is particularly interested in issues related to Colorado spiders. As part of this she is offering several courses related to spiders for anyone interested.

One activity is an in depth course at the DMNH on spiders meeting May 6, 13, 20 with a field trip on the 22nd. This one does have a cost: $45 for Museum members; $60 for non-members.

Then there are weekly, 3 hour field trips at various state parks, open to interested individuals, at 9:00 AM-Noon. (These are free, but may involve a charge to enter the parks.) Those currently scheduled include:

May 8 - Plains Conservation Center
May 15 - Eldorado Canyon State Park
June 5 - Mueller State Park
June 12 - Arkansas Headwaters State Park
June 19 - Lory State Park
June 26 - Golden Gate Canyon State Park
July 10 - Roxborough State Park
July 17 - Trinidad Lake State Park
July 24 - Vega State Park

July 31 - Crawford State Park
August 7 - Ridgway State Park
Augusts 14 - Castlewood Canyon State Park
August 21 - Plains Conservation Center
August 28 - Roxborough State Park

These latter trips are part of a statewide survey of spiders that Dr. Cushing is initiating. (Something long overdue!) And she is looking for survey participants.

For more information on the DMNH spider course or the various field trips to state parks, contact Dr. Cushing at:

Phone: (303) 370-6442
FAX: (303) 331-6492
email: PCushing@dmnh.org
(Cranshaw)

HAWTHORN MEALYBUG

Hawthorn mealybug is an insect that can be locally important, and one which I have recently learned some things about its management. The following is a summary of its biology and control:

HAWTHORN MEALYBUG (Two-Circuli Mealybug)

Phenacoccus dearnessi King
Homoptera: Pseudococcidae

Hosts: Several rosaceous plants, including hawthorn and Amelanchier, are reported as hosts of this insect. In Colorado, this insect has only occurred as pest on hawthorn.

Damage and Diagnosis: The hawthorn mealybug primarily feeds on the sap of twigs and small branches and heavy infestations weaken the plant and can cause twig dieback. The most common problems are associated with the large amounts of honeydew it excretes during feeding. Sooty mold and honeydew are often conspicuous and can greatly detract from plant appearance.

Later stages of the insects are conspicuous on the twigs, globular in form and covered with a red body that is finely covered with white wax. Small, but more elongate pale reddish-brown immature forms can be found on the bark of the trunk and larger branches during winter.

Life History and Habits: The hawthorn mealybug spends the winter, usually as a late stage nymph, on the trunk and larger branches, packed within cracks on the bark. In spring, female scales move to twigs and continue to develop, becoming full grown in May or early June. Adult males remain on the trunk until they subsequently transform to a winged adult stage that mates with the females.

After mating, the females swell greatly with hundreds of maturing eggs. The eggs hatch within the mother and crawlers emerge, although dispersal of the young nymphs is suspended during wet, cool weather. Peak production of nymphs occurs during late May and June, although it may extend into late summer. Only a single generation is thought to be produced, although the

egg producing females and egg hatch has been observed in late September suggesting a small second generation.

Newly emerged nymphs feed on leaves for a brief period, but later move to protected areas on twigs where they may remain through much of the summer. Populations often are again found in high numbers on leaves during late summer, where they often are found aggregating in leaf folds (domatia). Migration to overwintering areas on the trunk generally occurs during September and October.

Management: This insect has proven fairly difficult to control, due to its waxy body covering and habit of living under loose bark and in other protected sites. Spring treatments (e.g., Astro, Dursban, Merit) applied to coincide with the return of overwintered stages appear most effective; the addition of a horticultural oil is useful in providing penetration and coverage of the waxy body of these insects. Alternatively applications made in late summer or early fall directed against early instar nymphs should provide some control. Dormant season applications of oils should be applied to the trunks and under surfaces of branches where hawthorn mealybug overwinters.

Few natural enemies appear to be associated with this insect. Several species of lady beetles prey on immature stages, particularly on nymphs as they move to twigs in spring. However, after the mealybugs have settled on twigs and begun to swell with eggs they are rarely attacked.

Among hawthorn cultivars a range in susceptibility to mealybug has been observed. English hawthorn, Arnold hawthorn, and Thornless cockspur hawthorn appear particularly susceptible. Snowbird hawthorn, Russian hawthorn, and Macracantha hawthorn are less susceptible and Cordata Washington hawthorn appears resistant.
(Cranshaw)

ASH BARK BEETLES

Ash bark beetles have increased in importance in recent years, due to aging and high concentration of ash plantings, as well as stresses that have affected these trees. The following is the summary on these insects that will appear in the upcoming publication *Insects and Diseases of Woody Plants in the Central Rockies*:

ASH BARK BEETLES

Hylesinus species (= *Leperisinus* species)
Coleoptera: Scolytidae

Hosts: Green and white ash. Autumn purple ash is a particularly favored host.

Damage and Diagnosis: Adult bark beetles cut egg galleries under the bark and larvae tunnel perpendicular to the gallery. These injuries can girdle and sometimes kill branches. On rare occasions entire trees are killed by these insects. Injured limbs and heavily shaded branches in the interior of the tree are most commonly attacked. Transplanted trees can be at special risk. Ash bark beetles may infest almost the entire tree, from finger-diameter branches to the main trunk.

Egg galleries run across the grain and often have two "arms" with a central chamber in the middle. Also characteristic of these insects are that small "ventilation holes" perforate the bark above the egg galleries. The tunnels are almost invariably colonized by fungi that stain the

wood a rich brown color around the feeding sites. Sap may ooze from wounds in twigs, staining the bark.

Ash bark beetle has become increasingly important within the region during recent years. This is likely due to the general increase in ash plantings and, in particular, the increase in ash that has been damaged or is in decline.

Life History and Habits: At least two species occur in Colorado, *Hylesinus californicus* (Swaine) appears to predominate in the western areas and *H. aculeatus* (Say) in the east. Life history of both species is poorly understood under local conditions but the following is based on information from more northern areas and Colorado observations.

Overwintering can occur as either late-instar larvae under the bark or as adults that winter within niches cut into green bark of the outer trunk. Adults begin to become active in early to mid-spring and females construct girdling tunnels under the bark. During this tunneling small ventilation holes are also constructed that are exteriorly visible and sap may ooze from the wounds. These tunnels are the main egg galleries characterized by running at right angles to branch length.

The larvae are pale, legless grubs that develop by feeding under the bark, often extensively scoring into the sapwood. Those developing from spring eggs become full-grown in late spring or early summer and pupate within the tunnels. Adults emerge from the branch and feed on green wood, causing little damage.

There is evidence that a partial second generation is produced in some situations. These may not complete development and overwinter as larvae. Bark beetles that have reached the adult stage move to the trunks at the end of the season to cut hibernation chambers within which they winter.

Management: Ash bark beetle outbreaks often are, at least in part, related to conditions of growing stress. Well-sited, vigorously growing ash should be at much less risk of attack by this insect. Good cultural practices are fundamental to ash bark beetle management.

Pruning and disposal of infested branches can limit population development of the beetle. This needs to be done in spring, before adults emerge. Infested branches can be identified by showing wilting.

Preventive insecticide applications should be applied to coincide with periods when adults begin constructing egg galleries and laying eggs. In general this should occur by mid-spring. A repeat application may be needed later in the season for high risk trees where a second generation is present. Large, 2-inch caliper transplants, are at particular risk of attack and often will benefit from preventive insecticide treatment during the establishment years. Infestations of lilac/ash borer also seem to predispose trees to ash bark beetle attack.

Insecticides applied to the lower trunk in late summer can kill overwintering beetles which cut into the trunk for winter shelter. It is unknown if preventive insecticide sprays of branches, applied in early spring as for elm bark beetle control, may also be an effective control of adults as they move to trees for egg laying.

Several natural enemies of ash bark beetle have been observed. Clerid beetles and chalcid wasps attack the larvae and jumping spiders prey on the adults. (Cranshaw)

BROWNHEADED ASH SAWFLY

In recent years the brownheaded ash sawfly has developed into a common insect pest along the Front Range. The insect appears to have been originally introduced in the Arkansas Valley area by the early 1980s and since then has steadily expanded its range northward. Brownheaded ash sawfly is native to the eastern US, where it rarely causes concern.

Damage is cause by the larvae, which chew the leaves of ash during May and early June. The larvae are pale green "worms" with some light banding. During outbreaks they extensively defoliate the tree which can be a serious stress, particularly when it repeatedly occurs. There can also be nuisance problems associated with the worms as they leave and wander from the tree.

Life History and Habits: The brownheaded ash sawfly spends the winter as a full-grown larva within a cocoon in soil around the base of previously infested ash trees. Pupation occurs in early spring and the adults are small, black non-stinging wasps that typically emerge by late April. Because of the rapidity with which it has spread, the brownheaded ash sawfly apparently is a strong flier that can disperse long distances from a previously infested tree. During warm days swarms of the wasps may appear around trees as they mate and lay eggs. The eggs are inserted into the edge of expanding leaves, which usually results in a slight distortion of the leaves.

Early stage larvae feed on the interior of the leaf, producing small pinhole feeding wounds. As they get older, larvae feed extensively on the leaf, avoiding only the main veins. During the late stages of development, defoliation can progress rapidly. However, injuries also subsides quickly as the insects usually become full-grown within 2 to 3 weeks after egg hatch. During most years the larvae are active during May becoming full-grown by early June. Full grown larvae shed a papery larval skin that remains attached to the leaf and then crawl to the soil, where they form protective cocoons. There is one generation produced per year; the larvae remain in the cocoons until the following season.

Control of Brownheaded Ash Sawfly

No significant biological controls have been observed to attack brownheaded ash sawfly in Colorado, which are even largely avoided by birds. However, weather-related events seem to be particularly important in population cycles of the insect. One of the greatest checks on populations is late spring frost that kills the first flush of foliage - and with it the early active stages of the insect. Brownheaded ash sawfly is also a fairly delicate insect that can be easily dislodged from trees by strong winds, with few larvae successfully reestablishing. During very heavy outbreaks brownheaded ash sawfly can become so numerous that they may eat all the foliage and many may starve to death.

There are several considerations when deciding whether to control brownheaded ash sawfly. Established, healthy trees tolerate defoliation fairly well, particularly if it occurs infrequently. Any benefits to tree health are only likely if numbers of the insects threaten to remove at least 25 percent of the foliage. Trees that are repeatedly heavily defoliated or are in marginal health and/or are suffering from other important stresses (e.g., bark beetles, borers, scale) will have greatest benefit from treatment. Also, since defoliation progresses rapidly, treatments will be most useful if applied at an early stage of infestation. Incipient problems are best detected by watching leaves for the pinhole injuries that are made by the young larvae.

If treatment is desired, the brownheaded ash sawfly is easily controlled. A strong jet of water from the hose can knock many off a tree and soapy water is effective if applied to the body of

the larvae. Brownheaded ash sawfly also is very susceptible to essentially all garden insecticides (e.g., carbaryl/Sevin, chlorprifos/Dursban, permethrin, malathion). However, *Bacillus thuringiensis* (Dipel, Thuricide) and neem do not appear to be effective. (Cranshaw)

WHEAT IN GOOD SHAPE WITH RECENT RAIN

Recent rains have been great for the wheat. We have had no reports of virus diseases and no fungus leaf spots or rust have been seen. It should be noted that leaf rust is showing up in Oklahoma and Kansas to some extent but is not at critical levels yet.

While we have never recommended fungicide applications for wheat under Colorado conditions I still want to pass along some information from Bob Bowden the wheat extension pathologist in Kansas. He reports that if fungicides are to be used they should be applied between the boot stage (Feekes 10) and the fully headed stage (Feekes 10.5). In his last newsletter he also gave a good overview of what fungicides are available along with an excellent table. The following is taken from his last article. (Brown)

"**Quadris** is the newest fungicide available for wheat. It is so new that some chemical dealers may not be familiar with it. Quadris is a broad spectrum, preventative (ie. contact) fungicide with some systemic or curative activity. It has shown superior activity against leaf rust, tan spot, and the leaf blotch complex in university trials. Its main weakness is powdery mildew, but that is not a big factor in Kansas. Since Quadris has limited curative activity, application should be made prior to, or in the early stages of disease development. It can be applied through the heading stage (Feekes stage 10.5). There is a 45-day pre-harvest interval (PHI), which could be a problem in some years when the growing season is cut short by hot weather. Crop oil concentrate adjuvant increases efficacy.

Tilt is the standard treatment and is readily available from local distributors. It is partially systemic, so it is better than Quadris at arresting existing infections. It has very good activity against rusts, leaf blotch, and powdery mildew. It is weaker on tan spot, but it still gives good control. Last year, Kansas obtained a special local needs label that allows application through the heading stage. The PHI is 40 days. Do not graze or feed livestock with treated wheat, straw, forage, or hay. No adjuvant is required.

Bayleton is similar to Tilt in mode of action. Like Tilt, it is partially systemic. It is being phased out for wheat use, but existing stocks can still be used. At low rates, it is excellent on powdery mildew, but only fair on leaf blotch and leaf rust. It is not very effective against tan spot. The PHI is 21 days. A spreader/sticker adjuvant is required for Bayleton.

Mancozeb is an older, contact fungicide. Since it acts only on the leaf surface, it must be applied before infections begin. It is also subject to weathering, so activity typically lasts only 7-10 days. Timing is critical, so the efficacy of mancozeb is quite variable. If everything is timed perfectly, control of leaf rust and leaf blotch can be good. If it is applied too late or is washed off by rain, efficacy can be poor. Under heavy disease pressure, multiple applications may be required to achieve good control. A spreader/sticker adjuvant is required for mancozeb. Since mancozeb and Bayleton both have some weaknesses, they are often combined (2 lb mancozeb plus 2 oz Bayleton) to give a broad-spectrum tank mix.

On the chart below, don't forget to add about $5.00 for the aerial application cost.(Bob Bowden, Kansas State University, Manhattan, KS)

Product	Activity	Application cut-off	Labeled Rate Per Acre	Approx. Cost	Efficacy at Lowest Labeled Rate			
					Leaf Rust	Leaf Blotch Complex[a]	Tan Spot	Powdery Mildew
Quadris	Contact with some systemic activity	Feekes10.5, 45-day PHI [b]	6.2 - 10.8 fl oz	$2.35/ fl oz	E [c]	VG	VG	F
Tilt	Partially systemic	Feekes 10.5, 40-day PHI	4 fl oz	$2.85/ fl oz	VG	VG	G	VG
Bayleton	Partially systemic	21-day PHI	2 - 8 oz	$4.10/ oz	F[d]	F[d]	P	E
mancozeb	Contact	26-day PHI	2 lb	$3.00 / lb	F-G	F-G	F	P

[a] Leaf blotch caused by the fungi *Septoria tritici* and *Stagonospora nodorum*
[b] PHI = Pre-harvest interval; time that must elapse between application and harvest
[c] P = poor, F = fair, G = good, VG = very good, E = excellent
[d] Requires at least 4 oz for this efficacy.

GOOD TIME FOR TURF AERATION

One of the best investments in a healthy lawn is to have it core aerated. Now is a good time to aerate while the rains and cooler weather last.

If turf has a thatch build up of more than an inch, core aeration can be beneficial. In the Front Range, many soils are very heavy with lots of clay in them. Such soils are not optimum for growing vigorous turf. In many instances where sod was placed on poorly prepared ground and subsequently had numerous applications of fertilizer, frequent watering and sometimes excessive pesticide applications, such turf is ripe for necrotic ring spot (NCR) development. Studies here and elsewhere are highlighting the relation of stress originating from inappropriate cultural practices and the fungus that ultimately causes NCR.

Aeration also will help to decrease the impact of other diseases as well.

If you have aeration done, remember that the lawn is going to use more water than before, at least immediately after the aeration. Do not wait until it gets hot in mid-June and the summer. Most companies will continue to aerate as long as it is cool and there is sufficient rain, such as is the case now. If you can not arrange for aeration at this time and the lawn needs it check into getting it done in the late summer or early fall when the weather begins to cool.

Also, avoid heavy nitrogen fertilizing at this time. Pushing the lawn to be the 'greenest first' in the neighborhood may promote disease development. Lush growth early in the season frequently predisposes turf to Helminthosporium leaf spot and subsequently melting out. Also, you will not have to cut it so often!

Get into the swing of things and leave turf clippings on the lawn or use them for mulches or compost. Don't be a drag, don't bag!

Good cultural practices now, saves having to apply pesticides later (Brown).

RAIN LATE GOOD FOR FIRE BLIGHT BUT TEMPERATURES TOO LOW

With the recent rain, the time to consider fire blight sprays is here. Presently the temperatures are too low even though it is the peak of blossom development and there is plenty of moisture. Many fire blight susceptible trees are blooming and chances of infection if the temperatures go up will increase.

Watch trees over the next few weeks to insure that most of the blight was missed. If you see some blossom blast and later flagging it is possible to prune it out before it really runs. But remember to use good sanitation practices and get rid of the pruned wood.

Other trees such as aspen, sycamore and others are also pushing leaves and should be sprayed as the leaves approach full expansion if they have a history of fungual disease problems. (Brown)

CHRISTMAS IN APRIL--JUNIPER-HAWTHORN RUST GALL SHOWING

Wow- bright, orange rust galls are showing on area junipers. This disease, sometimes called cedar-apple rust, is widespread in Eastern Colorado. Even out in the plains it is not uncommon to see the bright yellow to orange rust galls in ornamental and windbreak junipers.

Symptoms

The rust first appears on hawthorns (and/or apples and other hosts) as small, yellow-orange lesions on the upper surface of leaves, on petioles, and on young fruit in the fall. Lesions enlarge rapidly on susceptible varieties. The lesions may be bordered by a red band or a chlorotic (yellow) halo. Small, orange-brown pustules (pycnia), less than 1 mm in diameter, develop within the lesions and create watery orange drops. After several weeks, yellow-brown lesions (1-15 mm in diameter) develop on the undersurface of leaves. These under-leaf lesions produce small, dark, tubular structures (aecia) which easily fracture to release red-brown spores. Similar lesions may also occur on fruit.

Fruit lesions are superficial and cause light brown necrosis in the surface. The brown pycnia often develop in fruit lesions, but the tubular aecia are less common.

Disease development

The fungus that causes the rust is Gymnosporangium juniperi-virginianae. The galls ("cedar apples") on juniper hosts exude horn like fungus structures (telia) during spring rains. The rain cause the telia to become swollen and jellylike, then afterwards drying back to dark brown threads. Swelling and drying of the telia may occur eight to 10 times during the spring.

The telia contain spores that during the rains, germinate to produce additional spores that are shot into the air immediately and spread by the wind. The spores that land on young hawthorn tissue germinate and infect the leaves if a film of water is present for a sufficiently long period. Immature leaves 4-8 days old are the most susceptible and fruit are susceptible from the tight-cluster stage until just after petal fall. One to 2 weeks after infection, orange-brown pycnia containing pycniospores appear on the upper side of leaves or on fruit.

The spores from the juniper **can not re-infect** juniper and the spores from the hawthorn (or other alternate host) can not re-infect hawthorn. Both alternate hosts must be available for the fungus to complete its life cycle (see figure 1).

One to 2 months after the appearance of pycnia powdery strings of spores from cup-like structures (aecia) appear on the lower surfaces of leaves or on fruit. The aecia produce spores, which are released during dry weather in late summer.

These spores then infect the juniper hosts. While the galls are formed during the first year it takes almost 2 year for the rust galls to mature. Eventually during the second year the mature galls are formed, thus completing the disease cycle.

Control

Juniper-hawthorn rust is controlled by fungicides, such as Bayleton (can be used on both juniper and apple) and Daconil 1787 (only used on non-food hosts). Rubigan, Banner and mancozeb fungicides are also labeled for rust diseases on non-food hosts. Heritage, a new fungicide is reported to be effective as well.

Traditionally fungicides have been applied on a calendar basis on commercial apples, from the pink stage of bud development until about 30 days after petal fall. It may be possible to use fungicides more efficiently by timing their application to coincide with infection periods by watching the development of the galls on the junipers. When the spore horns begin to emerge and turn gelatinous is the time when the fungicides will be the most effective.

Generally there is no need to apply fungicides to the junipers. If a juniper landscape is the priority then July-September fungicide applications would be warranted.

Cultural Practices

Spore sources can be reduced by removing nearby junipers or vice versa depending on which host you want the most. It is difficult, though, to eliminate infection sources completely, since the spores are carried long distances by the wind.

While Washington and cockspur hawthorns are resistant to the rust, there is another similar rust, cedar-quince rust, reported in Kansas that can attack these varieties. I do not know if this rust is in Colorado. It appears to be most prevalent in northeastern Kansas. Varieties of apple differ greatly in susceptibility to the fungus. Resistant varieties, such as Delicious, Liberty, McIntosh, Priscilla, and Tydeman's Early Worcester, can be grown without chemical sprays for cedar apple rust, whereas very susceptible cultivars, such as Golden Delicious, Jonathan, Prima, Rome Beauty, Twenty Ounce, and York Imperial suffer severe damage where the fungus is present and conditions are favorable for infection. (Brown)

EPA'S FINAL PMP RULE

EPA is issuing a final rule to protect groundwater from pesticides by restricting the legal sale and use of alachlor, atrazine, metolachlor, and simazine. The four pesticides are known to leach into groundwater at concentrations that may be harmful to human health and the environment, and have been identified as either "probable" or "possible" human carcinogens. EPA has determined that use of these pesticides may cause unreasonable adverse effects on the environment without effective management measures provided by a Pesticide Management Plan (PMP) developed by States and Tribes and approved by EPA. All uses, except totally indoor use of these pesticides, will be classified as restricted. Application can occur only by or under the direct supervision of a certified applicator, and only under the additional regulatory requirement that the pesticide be used according to the provisions of an EPA-approved State or Tribal groundwater PMP. The labels of these pesticides will be changed to reflect use restrictions. This rule will become effective in the spring of 2002. For further information

contact Arthur-Jean Williams, Environmental Field Branch (7506C), Office of Pesticide Programs, Environmental Protection Agency, 401 M Street, SW, Washington, D.C. 20460; telephone: (703) 305-5239; fax: (703) 308-3259; e-mail: williams.arty@epa.gov. (McDonald)

EPA PROPOSES TO REVOKE 206 PESTICIDE TOLERANCES

EPA is proposing to revoke 206 tolerances for certain uses of 15 pesticides: basic zinc sulfate, dalapon, ethoprop, ethyl formate, fluchloralin, glyodin, hydrogen cyanide, manganous dimethyldithiocarbamate, mepiquat chloride, metobromuron, paraformalehyde, paraquat dichloride, fonofos, coumaphos, and sesone. These pesticides are in the first priority group for tolerance reassessment under the Food Quality Protection Act (FQPA). Most of the 206 tolerances are proposed for revocation because the registrations for these pesticide uses have been canceled or there are no registered uses for certain crops. The complete list of the pesticide tolerances proposed for revocation and the reason for proposed revocation can be viewed at www.epa.gov/oppfead1/cb/csb_page/fyi/206toler.htm.

EPA has issued a Reregistration Eligibility Decision (RED) for paraquat, coumaphos, and mepiquat chloride. EPA evaluated the human health and environmental risk associated with the uses of each pesticide and issued decisions about their eligibility for continued registration. The FQPA assessment for coumaphos has not been completed. Only the tolerances proposed for revocation are included. EPA will announce other tolerance actions deriving from these REDs later.

Comments on the tolerance revocations proposal must be submitted by June 5, 1999. To obtain a copy of this Federal Register document or to submit written comments, please contact the Pesticide Docket, Public Information and Records Integrity Branch, Information Resources and Services Division (7502C), Office of Pesticide Programs, U.S. Environmental Protection Agency, 401 M St., SW, Washington, D.C. 20460; telephone (703) 305-5805. (McDonald)

DRY BEAN MANAGEMENT CLINIC FIELD SCHOOL

August 10, 1999 or August 12, 1999
7 a.m. to 5:30 p.m. at CSU - ARDEC located on
4616 NE Frontage Road, Fort Collins, CO
(I-25 to exit 271; 3 miles north on east side)

A one-day, hands-on workshop for growers, crop advisors, agricultural chemical applicators and dealers, and seed and implement dealers to enhance field diagnostic skills, demonstrate production and pest management strategies, and provide continuing education credits.

Field School Topics:

- Production Stages of Development
- Irrigation Management
- Nutrient Management
- Rhizobium
- Salinity
- Entomology
- Diseases
- Abiotic Stress
- Weeds
- Herbicide Mode of Action and Injury

Registration $150. Registration deadline June 15.
$25 discount for participants in Winter Dry Bean Clinic
[Note: $50 late registration fee after June 15]

To receive registration materials contact the CSU Office of Conference Services at:
Field School, Office of Conference Services
Colorado State University
Fort Collins, CO 80523-8037
Telephone: (970) 491-7501
Fax: (970) 491-3568
Email ocsreg@ocslan.sacc.colostate.edu
(Schwartz)

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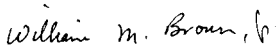
Where trade names are used, no discrimination is intended, and no endorsement by the Cooperative Extension Service is implied.

Sincerely,

William M. Brown, Jr.



Extension Plant Pathologist