



**NEW HAMPSHIRE VEGETABLE, BERRY & TREE FRUIT NEWSLETTER**

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**ASIAN SOYBEAN RUST – WHAT TO LOOK FOR**

You may have been hearing a lot about Asian soybean rust (SBR). Although NH is not considered to be a state with potential for serious losses due to SBR, we do have acreage planted to forage soybeans and to edible (edamame) soybeans. SBR is potentially devastating, causing severe crop losses in unprotected fields. When and if SBR does make it to NH, it is important that the ‘front line’ (growers, scouts, and crop consultants) know something about it. Since it is an introduced disease, it is important to map the spread of the disease, as well as the hosts. SBR has *already* been confirmed this year (2005) in Alabama, Florida and Georgia.

**A little background information:** In November 2004, the USDA’s Animal and Plant Health Inspection Service confirmed the presence of SBR on soybean leaf samples taken from a Louisiana State University research farm. It was the first instance of SBR found in the United States. The identified fungus, *Phakopsora pachyrhizi*, is the more aggressive of the two fungal species known to cause SBR (the 2<sup>nd</sup> has not yet been found in the US). All soybean cultivars grown in the US are thought to be highly susceptible. Although *P. pachyrhizi* is capable of infecting more than 90 species of legumes, many more may be infected.

**Symptoms:** Lesions first appear as very tiny yellow, irregularly shaped spots which later turn brown or reddish as the disease progresses. Lesions are usually confined to the veins or close to the veins. Spores primarily form on the underside of the leaf. SBR causes premature defoliation resulting in fewer seeds per pod, fewer filled pods per plant, early maturity and yield losses. The early stages of the disease may be confused with several other diseases common on soybean. In later stages of the disease, the key

diagnostic feature of soybean rust is the presence of egg-shaped pustules that are filled with cream to tan colored spores.

**What to do if you find it:** If SBR moves into NH, there are some extra precautions that you will need to take. ***If you suspect rust in a field:***

- Take note of when and where you see it (date, field).
- Put on disposable spray suits, change and wash before moving to the next field. (Rust spores can adhere easily to clothing and boots.)
- **PLEASE** collect samples. Collect 20-30 leaves with distinct lesions; place them in a plastic bag, then in a mailing box and immediately ship to:

UNH Plant Diagnostic Lab  
G37 Spaulding, UNH, 38 College Road  
Durham, NH 03824  
603-862-3841

I will verify if this is SBR (or one of the other soybean diseases), and confirm it with the Regional Plant Diagnostic Center and USDA. (This is to determine the strain of rust, which will help in developing future management programs.). Hopefully, we won’t see this disease in NH. Growers on the vegetable mailing list received a copy of the Soybean Pest Alert, which has some nice photos, with this newsletter. If you didn’t receive a copy and would like one, they can be downloaded from:

[http://www.aphis.usda.gov/lpa/issues/sbr/Soybean\\_Rust\\_22.pdf](http://www.aphis.usda.gov/lpa/issues/sbr/Soybean_Rust_22.pdf).

Additional information can be found at the following web sites:

- Pest Management Network: <http://www.plantmanagementnetwork.org/infocenter/topic/soybeanrust/>
- USDA soybean rust information site: <http://www.usda.gov/soybeanrust/index.shtml>
- USDA-APHIS (identifying soybean rust) [http://www.aphis.usda.gov/lpa/issues/sbr/SBR\\_IDcard\\_11-04.pdf](http://www.aphis.usda.gov/lpa/issues/sbr/SBR_IDcard_11-04.pdf)
- USDA-APHIS (symptoms on soybean & other legumes) [http://www.usda.gov/soybeanrust/downloads/soybean\\_rust\\_symptoms.pdf](http://www.usda.gov/soybeanrust/downloads/soybean_rust_symptoms.pdf)

*Contributed by Cheryl Smith, UNHCE Plant Health Specialist*

## PLANT TISSUE TESTING – WHEN & HOW

In the last newsletter, we covered the different types of information obtained from soil vs. tissue tests. Tissue tests are most commonly used for perennial fruit crops or high-value greenhouse crops that are continuously fed. In this issue, we cover when and how to sample to ensure that you get meaningful results.

**What to sample:** The nutritional status of a plant depends on the plant age and growth stage and the plant part sampled (e.g. young leaves, old leaves, stems, etc.). Because your results will be compared with results from the scientific literature, we recommend that you sample as below for each different crop:

When to sample	Plant part	# Plants to sample
<b>Blueberries</b>		
1st week of harvest	40 healthy leaves	10-20 plants
<b>Brambles</b>		
Non-fruiting canes, Aug. 1-20	60 healthy leaves	10-20 plants
<b>Strawberries</b>		
After renovation, Jul. 15-Aug. 1	40 of the first fully expanded leaves	10-20 plants
<b>Grapes</b>		
At start of veraison, mid-Aug. or 70 days after full bloom.	50-75 petioles from newly matured leaves on fruiting shoots.	10-20 vines
<b>Tree Fruits</b>		
Late Jul. or Aug.	50 leaves from the mid-portion of new shoot growth.	10 trees

### Taking Tissue Samples:

- **Avoid plants that are dirty, or that have recently been sprayed.** If very dirty, leaves can be rinsed with clean water and dried.
- Sample a few leaves from many plants, rather than many leaves from only a few plants.
- **Avoid sick, stressed, diseased, or abnormal plants.**
- **Keep different groups of varieties or plants separate.** For example, if you suspect that local soil conditions are causing deficiencies in a small area, sample the plants from the suspected area separately from other plants. Send the two samples in different bags along with two separate forms and two payments.
- **Supply as much information about the crop as possible.** This will help us give the most useful interpretation and fertilization recommendations.

**What to do with the sample?** Place the leaf samples in paper bags, and allow to air dry. You can also dry more quickly in an oven at 200F. Mail your dried sample, along with a tissue testing form, to UNH at the following address:

University of NH Cooperative Extension  
Plant Biology Department  
Spaulding Life Sciences Center, Room 117  
Durham, NH 03824

To get a form mailed to you, contact Cheryl Estabrooke at (603)862-3200. Forms are also online at: <http://ceadmin.unh.edu/soils/form/index.cfm>. Make sure to check “tissue testing” at the bottom of the form. The samples will be tested in Penn State’s analytical lab, but you will receive recommendations from one of the UNH extension specialists, depending on the crop.

**What about vegetable crops?** Because of the need for quick turnaround time for vegetable samples, we recommend that you mail them directly to the lab of your choice. There are several good choices, but one option is the Penn State lab, [http://www.aasl.psu.edu/plant\\_tissue\\_prog.html](http://www.aasl.psu.edu/plant_tissue_prog.html).

Most labs give you the option of specifying where to send a second copy of the analyses. Remember that if you’d like UNH recommendations or comments, please make sure a copy is sent to the appropriate UNHCE specialist (Becky Grube – vegetables & small fruit, George Hamilton – tree fruit).

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## VEGETABLE INSECT PEST UPDATE

Several insects that cannot overwinter in NH usually arrive some time in July. **Potato leafhopper** is one of them. PLH adults arrived in late June this year, and are present at low to moderate numbers on the crops I’ve checked as of July 6 (apples, raspberries, alfalfa). Crops that seem to be high on their preference list include potato, beans, and basil. In the past, we’ve sometimes seen symptoms on cantaloupe, strawberry, raspberry, beets and chard! Symptoms of PLH feeding include yellowing and crinkling or cupping of the leaves, then necrosis at the leaf edges. The leafhoppers are easiest to see by looking at the undersides of leaves.

**Tomato hornworm** and **tobacco hornworm** (they **both** attack tomato leaves) should be appearing at any time, and perhaps are already here in southern NH. **Corn earworm** moths might be here; I’m in the process of setting up traps in two Hillsborough County sites. If they arrive and there is no fresh corn silk on which to lay their eggs, they switch to laying eggs on tomato or (sometimes) soybeans.

Now I'll cover those that survive our winters. The first generation flight of **European corn borer** moths is well underway. Shotholes from the young larvae are visible on whorl stage corn right now. If 12 to 15 or more out of 100 stalks have injury, it is worthwhile to treat with an insecticide. I looked at my photos of shotholes, and decided that they won't be very helpful here unless they are blown WAY up, so I'll describe what I mean. Shotholes from ECB are very small — about 1 to 3 millimeters across. (there are 25 millimeters to the inch) They often show a tiny amount of whitish yellow, powdery frass at the edge. If you see large holes, with large diameter, messy frass, that's probably from armyworm or cutworms.

July is when we expect **squash vine borers** to be flying and laying eggs. The adults look like black and red wasps, and fly during the daytime. **Tortoise beetles** are active now, and sometimes putting a few round holes in foliage of tomato and potato. They usually aren't too serious. A related species, "gold bug" feeds on leaves of bindweed, morning glory, and sweet potato.

*Contributed by Alan Eaton, UNHCE IPM Specialist.*

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## BLUEBERRY CROP UPDATE

**Too few leaves!** Blueberry growers throughout the state have been reporting that their bushes have fewer leaves than normal. The leaves did not fall off — they never formed to start with. In some cases, the entire bush may be affected, but it's usually only select canes. Canes or bushes that have very few leaves tend to have abnormally heavy fruit set, and those with lots of leaves have comparatively few fruits.

**What's going on?** During the growing season, the blueberry bush forms buds for the next year — in spring and early summer, it produces leaf buds, and in late summer it produces fruit buds. Heavy fruit set this year means that the bush had sufficient energy to produce a lot of fruit buds last year. This may have been because yields were light (in part due to mummyberry) so they weren't spending energy ripening fruit. Blueberry bushes preferentially pour energy into ripening fruit rather than leaves. This is why we see canes that have either lots of fruit OR lots of leaves, but not both.

*An aside:* Pruning during the winter usually brings fruit and leaf buds into balance on the bush. Bushes that were pruned more heavily last year do not appear to be showing this problem as much as those that weren't pruned or that were pruned lightly.

*Another complicating factor:* winter injury can weaken canes slightly without actually killing buds. Weaker canes have less energy overall, so this problem may be more apparent on

exposed canes or older canes that were more susceptible to winter injury. The same goes for canes plagued by other problems — diseases, insect pressure, etc.

**Why is this a problem?** A cane or bush without leaves cannot produce the energy it needs in order to ripen the berries. So even though there are many berries, the berries will likely be undersized and undersweet, if they ripen at all. Further, the bush will not have excess energy to pour into either 1) next year's fruit buds or 2) the root system, strengthening it for the coming winter. This will stress the plant, or at least the cane in question.

**What to do?** The objective is to ripen and harvest as much of the current fruit set as possible. A couple of suggestions that may help:

*Fertilization:* Abundant rain earlier in the season probably leached some of this year's nitrogen so that it was not taken up by the bushes. A soil application now of 10-15 lbs actual nitrogen in the form of urea or ammonium sulfate would ensure bushes have adequate fertility and may help stimulate leaf cover. Bill Lord, former UNH fruit specialist, says that he has had success stimulating leaf cover with two foliar sprays, 7-10 days apart, of low-biuret (feed-grade) urea at a rate of 3 lbs/100 gallons of water. **Caution:** *Foliar sprays should not be applied the day after a long period of rain or if air temperatures are over 80F, to avoid burning plants. Research shows that soil fertilization is more efficient, but rain or irrigation is required to get the fertilizer in the root zone.* Avoid fertilizing after mid-July, since it will stimulate late-season growth that can make the plant more susceptible to winterkill.

*Fruit removal:* Depending on the severity of the problem, you may want to manually strip fruit or do some selective pruning to reduce the fruit load. This should be done ASAP, prior to mid-July. This may be more important for young bushes (<3 years), where stress may limit future plant growth. Fruit removal will increase the quality of the berries you do have. It will also reduce stress on the plant, and increase potential yields next year. Judging how much is 'too heavy' is subjective, but it's probably too heavy if you are already seeing that berries are smaller than you would expect (or than those on other canes). You will have to balance the labor required to remove fruit with potential benefits in yield, both this year and next. Even though you are cutting off fruit, these fruits will not likely ripen properly, and so you will not be losing profits. If not removed now, these canes should certainly be removed in the next pruning cycle. **Caution:** *IF you decide to prune now, make sure to sanitize shears frequently (i.e. between bushes) to prevent transmission of viruses or other diseases!*

**A caveat:** Too few leaves are a sign that the bush is experiencing any number of stresses. One such stress is winter injury, but others include nutritional problems, insects,

diseases, improper pH, etc. Trying to determine the source of the underlying stress is important to help manage it in future years.

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## TAKE 2: SARE GROWER GRANTS

Keep thinking about Northeast Region Sustainable Agriculture Research and Education (SARE) Partnership Grants. Each grant can provide up to \$10,000 to support on-farm research and demonstration projects. **If you are interested in testing new techniques, equipment, or ideas that can increase profitability and sustainability of your farm, these are a great way to do it with minimal cost to you.** For more information, see <http://www.uvm.edu/~nesare/FGinfo.html>. Several of us at UNH Cooperative Extension are interested in working with you to develop projects. Let us know if you've got an idea you'd like to discuss!

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## UPCOMING NH TWILIGHT MEETINGS

**GREEN WAGON FARM.** The 3rd statewide Twilight Meeting of 2005 will be held on July 26<sup>th</sup> in Keene. Bill Jarrell of Green Wagon Farm grows vegetables on approximately 25 acres in Cheshire County. We'll discuss insect and disease control in strawberries, mixed vegetables, season extension, and managing weeds. Pesticide credits (2) are available. **An important CORRECTION** to the announcement you may have received in the mail: **the meeting will be held at the Farm Stand on Court Street in Keene.** Contact Carl Majewski in Cheshire County at (603)352-4550 for directions or for more information.

**UNH – WOODMAN FARM.** This Twilight Meeting scheduled for August 16 in Durham. We will be highlighting research including variety trials (colored bell peppers in high tunnels and open field, and edible soybean – edamame), cucurbit breeding, tree fruit IPM, and much more. Stay tuned for more info as the date approaches!

- Wed. Jul. 22, **Organic Gardens & Farms Tour**, Andover, NH. Contact NOFA-NH (603)224-5022. **O, V, F**
- Tues. Jul. 26, **Green Wagon Farm Twilight Meeting**. Keene, NH. Contact Carl Majewski (603)352-4550. **V, SF**
- Sat. Jul. 30, **Organic Garden & Farm Tour, Peaked Hill Farm**, Gilmanton, NH. Contact NOFA-NH (603)224-5022. **O, V, F**
- Tues. Aug. 16, **UNH Horticultural Farm Twilight Meeting**. Durham, NH. Contact Cheryl Estabrooke (603)862-3200. **V, SF, F**
- Wed. Aug. 17, **Beginning Farming on Leased Land, South Village Garden**, Acworth, NH. Contact NOFA-NH (603)224-5022. **O, V, F**

## OTHER UPCOMING EVENTS

- Thurs-Sun Aug. 11-14, **NOFA (Northeast Organic Farming Association) Summer Conference**, Amherst, MA. Phone (978)355-2853 or email [nofa@nofamass.org](mailto:nofa@nofamass.org). **V, F, SF, TF, O**
- Tues-Thurs. Dec 13-15. **New England Vegetable and Fruit 2005 Conference**, Manchester, NH. For more info see <http://www.nevbc.org/>. **V, SF, TF, O, F**

Meeting topics: F = flower, O = certified organic, SF = small fruit, TF = tree fruit, V = vegetable

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This newsletter is a cooperative effort of the Vegetable, Small Fruit, Tree Fruit, and Sustainable Agriculture Specialists and Extension Educators at the University of New Hampshire. It is published monthly throughout the growing season. Its purpose is to keep you updated on issues and research relevant to production of vegetable and fruit crops in NH.

**Comments and questions are welcome. Address corrections, additions and deletions should be faxed to (603)862-2717, emailed to [becky.grube@unh.edu](mailto:becky.grube@unh.edu), or phoned in to Cheryl Estabrooke at (603)862-3200.**



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