



**Apple Pest Report: Thursday, July 30, 2009**

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## Scab

Scab levels remain low in monitored blocks. As trees reach terminal bud set, emergence of new leaves that are highly susceptible to new scab infections will end. As fruit develop they also decline in susceptibility to scab. But vertical water sprout shoots will continue growing later into the summer and provide host leaf tissue for new secondary scab infections. Fruit infections in September can lead to fruit lesions before harvest or to small black spots that develop during storage.

Captan, Topsin, or a strobilurin (Flint, Sovran, Pristine) will provide protection against new scab infections for 2 inches of rain or 14 days, whichever comes first.

The prevailing rain and cloudy weather in June and July has been favorable for the apple scab fungus. Some sunny relatively dry days with temperatures in the mid 80s will help to suppress whatever scab is present, but even in Sanford, the nice weather of the last couple of days has not been quite warm or dry enough to count on that.

Fortunately primary scab control was very effective so in most orchards there is not much secondary scab to take advantage of the favorable fungal growing conditions. The forecast for July 30-August 5 is about normal for temperature and slightly above normal for amount of rain and leaf wetness hours. The 6-14 day outlook for August 3-11 is for slightly increased chance for cooler and wetter weather than normal. I suppose that means that while the cloudy, cool, wet weather pattern for June and July may be easing up some, it isn't completely done yet.

If hot dry weather does not arrive before September, I am somewhat concerned that there may be potential for an increase in foliar scab as leaves senesce and lose their natural resistance in the weeks before leaf fall. Even if that did not affect this year's crop, it would increase the amount of scab inoculum for next spring.

Scheduling time to check 100 shoots and fruit clusters per block between September 10 – 30 provides useful information for managing scab efficiently and effectively next year. This scab index should not be done prior to September 10 as it could be misleading if observations are made before aging foliage begins to lose its natural resistance to scab infection. Sampling too late creates the problem of discoloration on aging leaves making it impossible to accurately assess whether scab

lesions are present. In doing a scab index, you must count ANY scab lesion on the leaf, no matter how small. That is not too hard if the leaf is 100% green, but it becomes impossible if the leaf is discolored by discoloration and decay spots as leaves age. Leafminer mines also get in the way.

Up to 15 acres can be counted as a single block. If the scab level is too high to use a delayed spray strategy the following spring, it often only takes a few minutes to exceed the allowable threshold of 18 scab-infected leaves per 100 shoots/clusters. If fall or early spring urea application or flail mowing will be done, a higher threshold of 28 leaves per 100 shoots can be used. If you find that there is too much scab to use a delay spray strategy, even if the time spent won't save you time by skipping early sprays next spring, you will have gained valuable information about which blocks require priority attention for scab prevention next spring.

If the number of scab-infected leaves is below threshold, a 100 shoot/cluster check takes about 30 minutes. As described on page 69 of the *2009 New England Tree Fruit Production Guide*, you can take a larger sample of 200 or 300 shoots if the number of scabby leaves falls into an intermediate zone to see if the block will qualify for a delayed spray strategy. I don't bother with that for two reasons:

But that takes more time, time that might be better spent rating another block instead of doubling the time to evaluate a single block.

2) If a larger sample is needed to classify the scab level as below the threshold for using a delayed spray strategy, then it is of a less clear cut case than blocks for which the number of infected leaves is so low that a 100 shoot/cluster sample is adequate. In effect, not considering a block qualified unless that can be determined with the 100 shoot/cluster sample is that same as using a lower, more conservative threshold. That gives an extra margin of safety by limiting the delay to very low scab blocks, and helps to compensate for any small scab lesions that might have been overlooked in sampling.

The required timing for doing a scab index is right in the middle of harvest when there is already too much other work to do. Adding another task to the work list during September is not welcomed. But the minutes invested in September can save hours and dollars in April and May 2010.

Dr. William MacHardy's research found that with a low scab index, it was safe to delay the first protectant fungicide protection until Pink or the 4<sup>th</sup> infection period, whichever came first the following spring. This research included many field trials in commercial orchards.

More recently, Dr. Dan Cooley has been testing the delay strategy using a shorter delay until Tight Cluster or the third infection period. Test orchards using delays in 2008 and 2009 have had equal or better scab control with fewer fungicide sprays than comparison blocks. A preliminary report on this research is online at <http://www.umass.edu/fruitadvisor/fruitnotes/v72n4/a5.pdf>

## Fire Blight

In 2000, fire blight killed over 250,000 apple trees on 1,000 acres of orchard in Southwest Michigan. Maine has never had a major region-wide fire blight outbreak, and most Maine orchards have no fire blight this year. But 2009 is shaping up to be the worst Maine fire blight year in memory.

At last count, at least eight Maine orchards have had significant fire blight strikes this year. Blossom blight became apparent by mid-June. Shoot blight strikes began appearing in early July. One of the affected blocks apparently had no blossom blight and the bacteria to cause shoot blight were apparently carried in from a nearby infected block.

The severe infection blossom blight conditions in late bloom in 2007 (that didn't lead to problems even in orchards that did not apply strep) may have increased the background inoculum level of the fire blight bacteria on wild hosts and perhaps undetected scarce infections in Maine orchards. An increase in inoculum level is one explanation for why the number of affected orchards and severity of infection is worse in 2009 than following the 2007 blight infection period, even though the blossom infection conditions this year were marginal compared to the severe blossom blight infection weather we had in 2007. Whatever the reason, fire blight seems to be creeping up each year.

If Maine orchards are now in a higher risk category for fire blight, at least for the next few years, what does that mean for growers? If the coming years do not provide suitable infection conditions then presumably the background inoculum level should drop and we would be back to only worrying about fire blight when extreme weather conditions occur. But if we have recurring weather suitable for fire blight infections, and those infections are not prevented, then fire blight could become a pest that requires yearly attention from growers. That is the situation in most other apple growing areas.

In that situation, apple and pear growers need to have quick access to streptomycin to respond to blossom blight infection conditions that can develop with only a couple of days notice, and hail trauma blight that can occur with no notice at all. Growers would need to budget time for planned surveillance for blossom blight and shoot blight strikes on a frequent basis in late May – mid July. Daily checking would not be overkill. It would call for having capacity to react quickly with sanitation pruning where fire blight is found, using "ugly stub" pruning, and removing cuttings from the orchard. A higher level of fire blight risk could lead to rootstock and scion cultivar susceptibility becoming a bigger factor in planting decisions.

For those growers with fire blight this year, unless terminal shoot growth has stopped, do not do summer prune or break off rootsuckers, especially during wet weather. Do not leave prunings in the orchard unless the weather is sunny and dry. It can take a week of sunny dry weather for the tissue to dry enough to no longer serve as a host for fire blight bacteria. Chopping prunings with a mower before they are dried could spread the disease.

Dr. Tim Smith, Washington State University Cooperative Extension has a comprehensive review of fire blight biology and management at <http://www.ncw.wsu.edu/treefruit/fireblight/principles.htm>, including this statement: "Wetting from sprayers has not apparently triggered blight in the Pacific Northwest."

The apple-crop email discussion group (which you can subscribe to by sending a message to [requests@virtualorchard.net](mailto:requests@virtualorchard.net)) has had some interesting discussion of fire blight topics this summer. Here are a couple of excerpts from apple-crop messages by Cornell University research and Extension staff.

\*\*\*\*\* Those of us who have worked with or experienced fire blight know that this disease is very difficult to understand and manage. What works on one cultivar, in one year, or in one location may fail to work on another cultivar/year/location and what is cost-effective for one apple grower may be totally implausible in other economic models.

\*\*\*\*\* Pruning out strikes? Unless the tree shoots stop growing, and you have hot, dry weather, it is difficult to not cut out the strikes without seeing infection below the cut or in the new shoot that springs from the strike. I have seen a lot of effort in removing strikes, and if just a few per tree in large trees, it might be worth it, but in highly susceptible trees that are vigorous and continue to get infected shoots and canker blight, eventually you have to walk away and wait until dormant pruning time to correct the situation, and follow up with copper pre-bloom, well-timed strep sprays during bloom etc.

My experience is that growers suffer an epidemic year, and then all pieces of the management puzzle are put in place the following year and there is no fire blight the following year. Let's hope that is the case and we don't lose too many M9, M26 rootstocks in the meantime.

Some excerpts from a University of Illinois fire blight fact sheet ([http://web.aces.uiuc.edu/vista/pdf\\_pubs/801.pdf](http://web.aces.uiuc.edu/vista/pdf_pubs/801.pdf))

\*\*\*\*\* Nitrogen fertilization, late fertilizer application, poor soil drainage, and other factors that promote succulent growth or delay the hardening of the tissues from midsummer into autumn tend to increase the severity of this disease.

\*\*\*\*\* Apply fertilizer in the early spring (6 weeks before bloom) or apply in late fall after growth has ceased. Applications in midseason prolong the time during which shoots are susceptible to infection and increase the likelihood of winter injury to tender wood.

\*\*\*\*\* Along with M9 and M26, Bud 9 is a highly susceptible rootstock. M7 is intermediate.

And finally, a series of landmark articles in 2000 by the late Dr. Paul Steiner: *The Biology and Epidemiology of Fire Blight*, <http://www.caf.wvu.edu/KEARNEYSVILLE/articles/FB-BIOLOGY00.html>

*A Philosophy For Effective Fire Blight Management*, <http://www.caf.wvu.edu/KEARNEYSVILLE/articles/PHILOSOPHY2000.html>

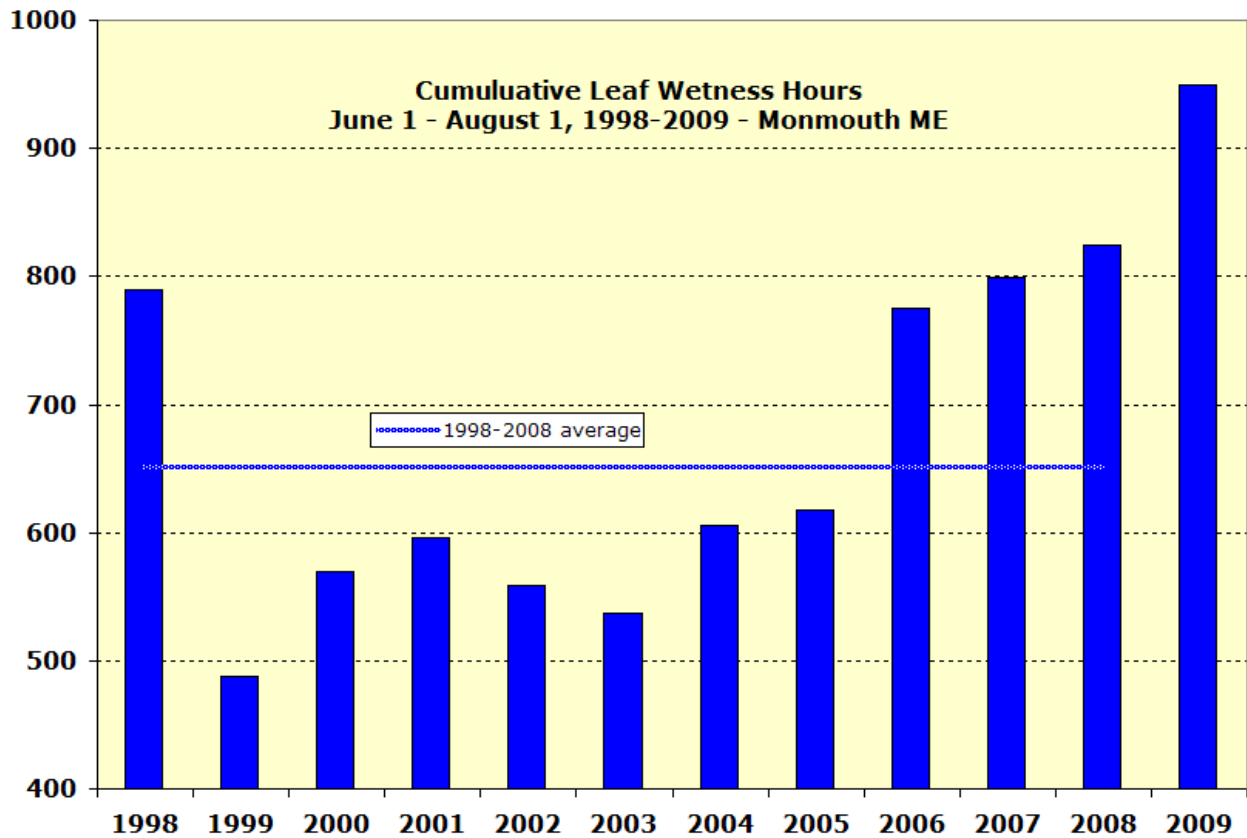
*Managing Fire Blight in Apples*  
<http://www.caf.wvu.edu/KEARNEYSVILLE/articles/FB-MANAGE00.html>

*Problems in Managing Fire Blight in High Density Orchards on M-9 and M-26 Rootstocks*  
<http://www.caf.wvu.edu/KEARNEYSVILLE/articles/SteinerHort1.html>

*How Good Are Our Options With Copper, Bio-controls and Aliette for Fire Blight Control?*  
<http://www.caf.wvu.edu/KEARNEYSVILLE/articles/SteinerHort2.html>

## Flyspeck and Sooty Blotch

After a dry April and May, leaf wetness hour accumulation for June 1 (roughly when flyspeck infection risk begins) and August 1 at Highmoor Farm this year is running 46% above the 1998-2008 average. While the relationships between cumulative leaf wetness hours and flyspeck and sooty blotch incidence and severity have not been specifically defined, there is clearly higher risk of flyspeck and sooty blotch infection in wetter growing seasons.



The forecast for the coming week is for 2.5 times the normal weekly amount of rain. The outlook for August 5 -13 is for greater than normal chance of cool temperatures and about normal rainfall. The three month outlook for August – September – October is for above average temperatures and normal rainfall. The normal rainfall part sounds good, but elevated temperatures during September and early October and may increase the risk of flyspeck by prolonging the dates during which it is still warm enough for optimum growth of the fungus.

Fungicide coverage against SBFS should be renewed as soon as it is assumed to have been depleted in order to maintain continuous protection.

Dr. David Rosenberger of Cornell University is recommending that a phosphite fungicide be included in the final spray application to provide extended protection against SBFS. Aliette was the first phosphite fungicide. It is labeled primarily for suppression of Phytophthora root rot. There are now several generic phosphite fungicides available – ProPhyt, Phostrol, Agri-Fos, Fosphite, Fungi-Phite, and Topaz.

In an upcoming issue of New York Fruit Quarterly (Summer 2009) there is an article on "*Using Phosphite Fungicides to Control Apple Diseases*" by David A. Rosenberger and Kerik D. Cox.

The article discusses tests done with ProPhyt, but the results probably apply to other phosphite fungicides also. Tests were conducted in situations with light to high sooty blotch infection pressure, and with moderate to severe flyspeck infection pressure. Here are notes from the article:

- Fungicide usually showed longer residual activity against sooty blotch than against flyspeck. Sooty blotch incidence was lower than flyspeck incidence in each test.
- ProPhyt was not effective against apple scab, or against summer fruit decay and lenticel spots caused by Botryosphaeria fungi (black rot and white rot).
- For suppressing flyspeck, Pristine > Topsin M > Captan. (All three fungicides were used at standard rates, i.e. Pristine 38WDG @ 5 ozs./100 gals. > Topsin M 70WDG @ 4 ozs./100 gals. > Captan 80WDG 15 ozs./100 gals.)
- Fungicides used alone were compared to fungicide + low rate ProPhyt (8 ozs./100 gals.) and full rate ProPhyt (16 ozs./100 gals.) The ProPhyt label allows use at up to 64 ozs. per acre, presumably referring to the old standard 400 gallon per acre tree size. Thus the dilute rate is 16 ozs./100 gallons.
- Adding low rate ProPhyt to Captan treatments improved control in 11 out of 14 tests where there were discernible differences to measure. Adding high rate ProPhyt to Captan improved control in 13 out of 14 tests.
- Adding low rate ProPhyt to Topsin M treatments improved control in 4 out of 9 tests where there were discernible differences to measure. Adding high rate ProPhyt to Topsin M improved control in 5 out of 9 tests.
- Adding low rate Pristine treatments improved control in 3 out of 8 tests where there were discernible differences to measure. Adding high rate ProPhyt to Pristine improved control in 4 out of 8 tests.
- Adding ProPhyt to standard fungicides (Captan, Topsin M, Pristine) was most advantageous in the tests with high flyspeck infection pressure.

- ProPhyt used alone at low rate was statistically better than no fungicide treatment in 13 out of 16 tests. ProPhyt used alone at high rate was better than no fungicide in 14 out of 16 tests.

A study by Drs. Dan Cooley and Wes Autio, and James Gamble showed that summer pruning cut cumulative leaf wetness hours inside the canopy by more than half, and reduced flyspeck incidence by 50% in unsprayed apple trees and reduced flyspeck severity in sprayed trees.

<http://apsjournals.apsnet.org/doi/pdf/10.1094/PDIS.1997.81.10.1123>

Calcium chloride applications have also been shown to reduce flyspeck. But the combination of CaCl<sub>2</sub> with fungicide products for that purpose has not been tested.

## Insects and Mites

### Apple maggot



Only a few apple maggot flies captures on red ball sticky traps have been caught. None of the monitored blocks are over threshold. Because apple maggot populations vary tremendously between blocks, it is difficult to make a statewide statement about population levels.

It is not unusual to have AM not reach threshold until late July. With the cool temperatures, frequent rain, and cloudy skies for the past two months, it is not surprising to find that AM development in the soil is delayed. I don't think they drowned. Degree day accumulation has dropped back two weeks compared to the calendar average since June 1. And that doesn't factor in the cooling effect of rain and overcast skies on suppressing soil temperatures. So it would not be surprising for AM emergence to increase over the next two weeks.

If you don't have traps, you don't have anything to base decisions on, so protective spray is the safe option. If you do have traps and they are below threshold, but you need to make a spray trip to renew fungicide coverage, you can skip the insecticide as it is not really needed at this time. By the time AM do reach threshold you will probably be due for fungicide renewal and another spray trip anyway. Your local AM population is not likely to explode in just a few days, leaving you wishing you had included insecticide in the previous spray trip. And if you do find need for AM protection prior to the next spray trip for fungicide renewal, a perimeter application will provide substantial protection with less chemical and labor cost, and will suffice until the next full block spray trip.

## Mites

Mite populations remain low in almost all monitored blocks. An increasing portion of European red mite (ERM) eggs laid from now on will not hatch until next spring. Twospotted spider mites (TSM) can increase at the end of August, but one advantage of the wet cool weather this summer is natural suppression of pest mite populations.

If treatment is needed, Acramite, Nexter (25 day PHI), Kanemite, Portal, and Zeal are all effective options. Nexter works better against ERM than TSM, while Acramite tends to be better on TSM than ERM.

Mite sampling was discussed in the previous newsletter. Here are the mite threshold points for August 1-31.

### Presence/Absence Chart for Threshold of 7.5 mites per leaf or 86% of leaves infested

Number of leaves examined	column 1:	column 2:	column 3:
	if number of infested leaves is < or = to value in this column, then mites are estimated to be <b>FAR BELOW</b> threshold	if number of infested leaves is < or = to value in this column, then mites are estimated to be <b>BELOW</b> threshold	if number of infested leaves is = or greater than value in this column, then mites are estimated to be <b>ABOVE</b> threshold
40	18	27	40
80	44	65	74
100	63	85	86

**Japanese beetles** have made their annual appearance in home gardens.

Defoliation of a branch here and there is not a mortal threat to apple trees, but severe defoliation of young trees could have economic impact. Fruit damage is uncommon on apples, but can be serious on peaches and other stone fruit as they approach maturity. Assail (and Calypso on apples, but it has a 30 day PHI), Sevin, Leverage and Provado are effective controls.

**Leafminers** are not a problem in any of the monitored blocks

**Codling moth** 1<sup>st</sup> generation egg hatch is complete and 2<sup>nd</sup> generation hatch is expected to begin in early to mid August in Sanford and Monmouth, respectively. Bt products and Intrepid are most effective against recently hatched larvae. Delegate, SpinTor and Proclaim are also effective, and are better choices for larger larvae.

**Woolly Apple Aphids** (WAA) are infrequent but difficult to control pests than can build up at the end of summer. WAA are protected by the waxy coating they secrete. Diazinon is the only material with an excellent rating. Provado, Assail and Calypso are rated slightly effective, as is Thionex (endosulfan). It is worth noting that endosulfan is the target of a campaign to cancel its uses and remove residue

tolerances from food crops. Diazinon and Thionex both have 21 day preharvest interval (PHI).

Beleaf also includes WAA on the label, but that is no guarantee of efficacy. You might be surprised to learn that the EPA does not regulate pesticide label requirements do not require proof of efficacy, just proof on no unreasonable chance of causing harm to people or the environment.

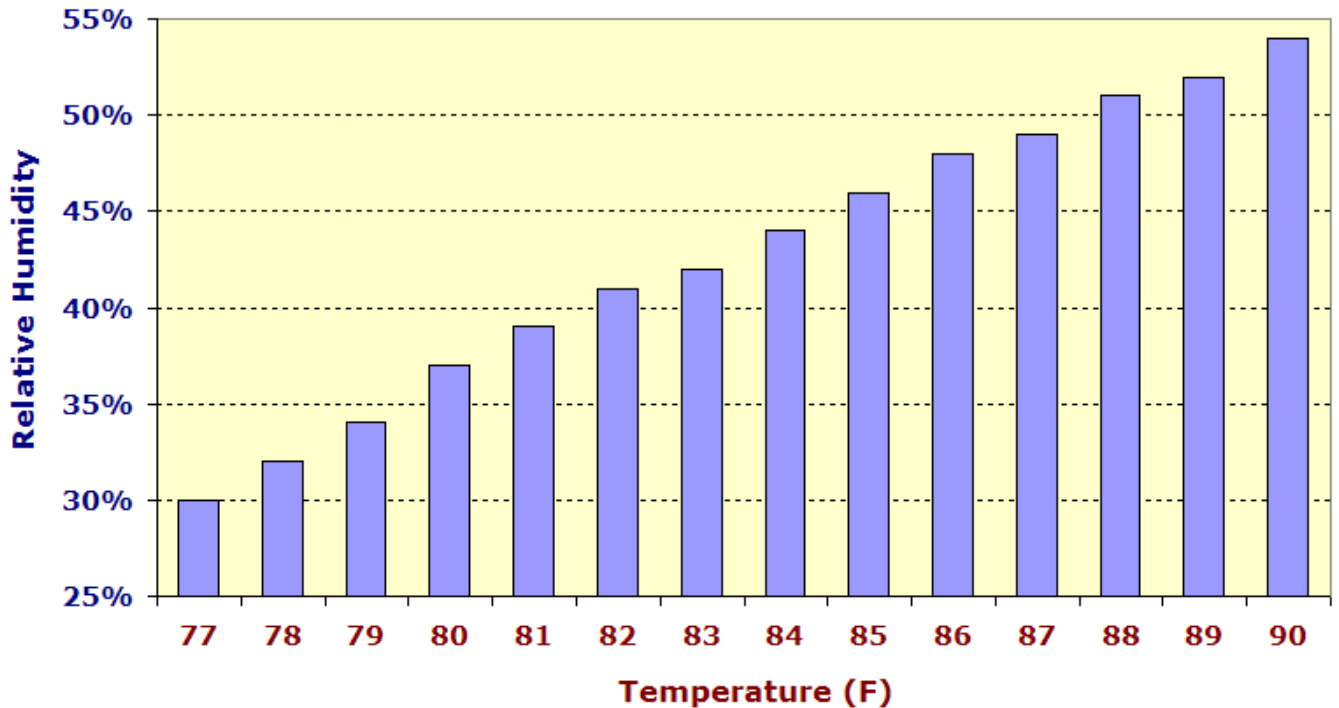
Summer oil applied in a high volume of water is also effective, but is not an option if you are using captan fungicide for disease control.

**Stinkbugs** are also infrequent but tough to control late season pest. In addition to the pyrethroids, Actara (14 or 35 day PHI, depending on application rate), Diazinon (21 days), Thionex (21), Assail (7), Avaunt (14), Beleaf (21) are options.

## Spray Drift and Herbicide

1) In case we get hot weather, here are estimated relative humidity values below which rapid drying potential of small droplets could lead to increased drift potential.

**Temperature and Relative Humidity Combinations above which Small Droplet Evaporation can Increase Drift Potential**



2) Applying glyphosate (Roundup) herbicide after July 1 increases the chance of trunk injury, especially on young trees. With glyphosate now off patent, there are many generic formulations beside Roundup. These formulations are not interchangeable so you must be sure to read and follow the label for the product you have.

Gramoxone and Rely are commonly used alternatives to glyphosate for late season contact burn-down. A 2, 4-D product (2,4-D Amine, Amine 4, Unison, Weedar 64) is an effective control for perennial broadleaved weeds.

With any herbicide, use a drift inhibitor to help keep the spray going off target. A latex paint whitewash not only helps protect against sudden freezing (Southwest Injury) and borers, it provides additional protection against misplaced postemergent herbicide.

## Upcoming events

The **100<sup>th</sup> anniversary of Highmoor Farm** will be celebrated with farm tours and glorious proclamations on **Wednesday, August 19, 2009**.

## Closing words

**Neil Armstrong:** "Houston, Tranquility Base here. The Eagle has landed."

**Capcom Charles Duke:** "Roger, Twan... [correcting himself] Tranquility. We copy you on the ground. You got a bunch of guys about to turn blue. We're breathing again. Thanks a lot."

-- "The First Lunar Landing - Corrected Transcript and Commentary". NASA. Jones, Eric M. (1995)



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