UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

Volume 18, Number 8 June 28, 2007

Crop conditions

Irrigation pumps geared up on vegetable fields across the state. Scattered thunderstorms brought wind and rain (and sometimes hail) to a few locations -- but most are very dry. Crops on gravelly and sandy soils are starting to wilt and curl. Where water is adequate, the heat has produced rapid and strong growth. Rapid bolting of greens, radishes and lettuce is a problem given the combination of very high temperatures and long days, especially where there is lack of water. Greenhouse tomatoes are ripening. Summer squash, zucchini and cucumbers along with lettuce, greens, peas, and cabbage are being harvested. Seasonal farmstands are opening up.

The presidedress nitrate test is a good tool to determine if a nitrogen side dress is needed after the crop is established -- before corn gets above 12-18 inches, or before vines start to run on cucurbits. Tests will be processed within two days at the UMass Soil and Tissue Testing Lab. For more details call the Soils Lab at 413-545-2311 or see http://www.umass.edu/plsoils/soiltest/.

Cucurbit diseases have become much more complex and damaging over the past ten years. It has become much more complex to figure out if and when to spray, with what, and for what. Over the next several weeks, Vegetable Notes will have a series of articles on cucurbit disease management. This issue highlights Plectosporium Blight, a new and serious disease of cucurbits in New England. We also provide a guide on how to figure out your fungicide spray schedule depending on which disease arrives first.

Downy mildew alert

In last week's newsletter we ran an article about a downy mildew infestation out of Canada. Normally this fungus overwinters way down in southern Florida and doesn't make it up here until much later in the summer. This year it managed to overwinter in some Canadian greenhouses that produce cucumbers year round. This put it much closer to our doorstep than usual. Last week we were advising people not to start spraying yet, as it hadn't gotten close enough to us yet to be any immediate danger to fields in MA. Weather conditions over the past week have spread the disease as far as Geneva, NY. This puts fields in MA at risk for infection in the near future. At this point, we would recommend starting a preventative spray program.

Rhode Island twilight meeting for vegetable growers

Vegetable Growers in Southeastern New England Mark Your Calendars!

A twilight meeting will be held at Pezza Farm, 2279 Plainfield Pike, Johnston, RI. 02919, on July 17 from 4-7pm. The farm is owned and managed by Mike and Doreen Pezza. Pezza Farm is a garden center that also grows sweet corn, pumpkins and various vegetables for their stand. Mike Merrill from NRCS in RI will discuss ways that theEQIP program can help vegetable growers with various conservation practices, including IPM.

Directions: Pezza Farm is located in Johnston, RI on Rt. 14, Plainfield Pike between Rt. 295 and Rt. 116. From Rt. 295, take Exit #4 and head west on Rt. 14 about 2.5 miles. From Rt. 116, head east on Rt. 14 about a mile.

The farm website: http://www.pezzafarm.com/

2 hours of pesticide recertification credits has been requested fron from RI DEM.

Sweet corn herbicide and zone tillage demonstrations

Friday, July 6, 2007 at the Cornell Valatie Research Farm, Valatie, NY (State Farm Road off Route 9/9H, just north of Valatie)

Come join Cornell's Vegetable Weed Specialist Robin Bellinder and the Capital District Vegetable Program for its annual weeds day at the Valatie Research Farm. We will visit several sweet corn herbicide trials including a rowcover trial. You will also be able to view ongoing minimum tillage trials on sweet corn including rowcover vs. plastic for early production, a cover crop selection trial and a deep nitrogen placement trial. The 2-row zone builder unit we built will also be on hand to see.

Registration is at 1:00 and the meeting will run from 1:30-3:30. For more information call Chuck Bornt at 518-859-6213. DEC and CCA credits have been applied for. The Field Crops Weed Day is scheduled for the morning and will run from 9:00 till 12:00 so come and make a day of it if you can.

Directions: From Albany: follow I-90 east (towards Boston) to Exit 12 (Route 9, Hudson). Turn right onto Route 9 and head south for approximately 2 miles to your first traffic light. Turn left onto Country Route 28 and travel for approximately 1.5 miles. Turn right onto State Farm Road and travel for another 1 mile. The Valatie Research Farm will be on the left.

From the south: at the traffic circle bear your first right coming from 9: If coming from 9H, take the second right onto State Farm Road (Four Brothers Restaurant should be on your right hand side upon turning onto State Farm Road). The farm is approximately 0.5 mile in on the right.

Potato insect updates from Long Island

Editor's note: the following updates may not correspond exactly to conditions in new England but provide a good warning of what to look for.

Colorado Potato Beetle: High numbers of large larvae were observed in fields this week (third and fourth instar) with small larvae present in moderate to high numbers as well. Egg masses are present but decreasing in number representing that the end of the first generation is soon approaching. SpinTor has provided good control of the larvae stage to date. (SM)

Colorado Potato Beetle Control: Notes from Long Island. We have seen moderate CPB pressure in our trials at the Long Island Horticultural Research and Extension Center. Kryocide continues to provide good control of the larvae. SpinTor, although not performing as it did a few years back, continues to provide fair to good control and may be worth incorporating into your program. However, this material has provided varying levels of control from farm to farm. This year for the first time in several years we are testing the active ingredient Abamection (Abba, Agri-Mek). Agri-Mek was labeled for CPB 10 years ago. This year we are testing Abba at 8 and 10 fl. oz per acre. Abba has provided very good control of small and medium size larvae in our research plots. From work conducted a few years ago we found it's important to make applications when the larvae are on the top of the plants, since direct spray contact ensures excellent control, especially on large larvae. Compared to other products Abba is a more expensive treatment, but may be worth using as an alternative product. (DDM)

Potato Leafhopper: Adult leafhoppers are increasing in number throughout the area and scouts noted a few nymphs this week in fields not treated with Admire. At this time, it is not necessary to spray fields that have been treated with Admire but action should be taken to control for this pest in fields that did not receive an at-planting Admire treatment. In most years, leafhoppers begin to survive in Admire treated fields in early to mid-July. Growers should be on the lookout for nymphs in the field as a sign that the Admire is no longer effective. See the June 1 newsletter and the Cornell Guidelines for scouting procedures and treatment options.

European Corn Borer: We are seeing early instars of borers in fields planted to earlier varieties such as Andover and Superior. Growers should be out checking potato plants for signs of tunneling into petioles and stems. A threshold of 35% infested stems is suggested by Cornell where Mid-Atlantic States use a more conservative threshold of 10%. SpinTor used for Colorado beetle control will provide control for corn borer. Late Blight Update: No blight has been reported in the Northeast to date. Growers should be applying fungicides on a 7-10 day spray schedule. (SM)

-Excerpt from Long Island Fruit and Vegetable Update, June 22, 2007 Authors: Dale Moyer (DDM), Sandra Menasha (SM), Alice Wise, Cornell Cooperative Extension, Suffolk County, Riverhead, NY

Squash bugs in vine crops

Squash bugs have for many years been considered a minor pest in vine crops in New England. However in recent years some growers are finding higher numbers and resulting crop damage. It is important to assess whether damaging numbers are present. Growers don't need to try to get rid of every squash bug, but it is important to be aware of what risks exist.

Squash bug adult

Adult squash bugs are 0.5 to 0.75 of an inch long, flat, gray-brown, and usually found on the underside of leaves, under residue, or in cracks in the soil. Squash bug eggs are laid in tiny clusters (usually on undersides of leaves in the notch between leaf veins) and change color from yellow to bronze shortly before hatching. Wingless nymphs are light gray with black legs and grow darker as they become adults in late summer. There is one generation per year. Adults spend the winter in crop residues and protected sites in or near the field. Photos of adults, nymphs and eggs are in the Pest Identification Supplement to the New England Vegetable Management Guide. The Supplement is available in hard copy from the UMasss Outreach Bookstore (413-545-2717) or as a downloadable pdf file at the Guide website (http://www.nevegetable.org); photos are on the web individually at http://www.umassvegetable.org)

Both adults and nymphs feed by inserting their beak and sucking juices from plant tissue. Feeding causes wilting in leaves, stems, and vines that are beyond the feeding site. The injury may also appear as light-colored areas that later turn brown and die. These symptoms are similar to bacterial wilt symptoms. Later in the season, squash bugs may feed on the fruit. Squash bugs are virtually impossible to control later in the season when nymphs are large and the canopy is dense.

Crops affected. Pumpkin and squash are the cucurbits most affected by squash bugs, because they prefer to laid eggs on these crops and because the nymphs flourish. Because of low attrac-

tion and low survival rate, squash bugs do not usually become a pest on cucumber, watermelon, butternut squash and muskmelon. *Cucurbita moschata* crops such as Waltham butternut have been found to have fewer squash bugs. If summer squash gets away from you and gets too big to harvest, squash bugs will move in and feed on the unharvested fruit.

Cultural practices influence squash bug numbers. Clean cultivation lowers the attraction of crops to squash bug. We have observed higher numbers in fields with hay or straw mulch and in low-till or no-till situations where cover crop residues are high. Blue Hubbard squash as a perimeter trap crop has shown some efficacy in trapping squash bugs as well as cucumber beetles, because it is preferred over many other vine crops. In Texas, many growers have successfully used early-planted straightneck summer squash ('Lemon Drop'or 'Hyrific') as a trap crop in the border rows of their watermelon fields to attract and control squash bugs to manage CYVD.

Squash bug nymphs

Scouting and threshold. The key to preventing squash bug problems is early detection and control of small nymphs. Scout for squash bugs adults and eggs by searching upper and lower leaf surfaces and soil cracks around the plant. Insecticides may be warranted if squash bugs are causing wilting of young plants (if wilting is observed and squash bugs are present on the underside of leaves). Just before flowering, fields should be scouted for egg masses. This is the critical time to control squash bugs. If more than one egg mass per plant is found, an insecticide application is needed. Adult squash bugs and older nymphs are more difficult to control because they develop a hard exoskeleton as they mature. In addition, since squash bugs are secretive and the canopy grows thick, they can be difficult to reach with insecticides.

The synthetic pyrethroids and other contact insecticides available are most effective against young nymphs. To control adults, the new generation synthetic pyrethroids (i.e. Capture) tend to work better than most other materials to control the squash bug. Spraying seedlings with synthetic pyrethroids should also control cucumber beetles and bacterial wilt. Sevin is no longer effective for squash bug control in CT (though it is very effective against striped cucumber beetle). However note that these are toxic to bees and should be used cautiously during flowering. The only OMRI listed (organic) product is include azadirachtin (Neemix 4.5) for application to young squash nymphs.

There is also a parasite of squash bug that may be visible in the field. It is a tachinid fly, *Trichopoda pennipes*, which has a colorful bright orange abdomen and dark wings. Eggs are laid on the abdomen of the adult squash bug; parasitism may be as high as 80%, but unfortunately, the adult squash bugs are not killed before they feed and lay eggs on plants.

Squash bugs may also vector a relatively uncommon but serious disease, Cucurbit Yellow Vine Disease caused by the bacterium *Serratia marcescens*. The presence of this disease was first noted in New England in 2003. If this disease has occurred on your farm, it is critical to focus on controlling early season adults to prevent its spread. A good article by Jude Boucher on cucurbit yellow vine may be found on the web at http://www.hort.uconn.edu/ipm/veg/htms/cucrbinct.htm

If you see symptoms of wilt or feeding damage and are not sure of the cause, look for presence of squash bugs, and also contact the Disease Diagnostic Lab (413-545-3209) to send a sample for diagnosis.

--R Hazzard, UMass Extension Vegetable Program with information drawn from: T. Jude Boucher, Univ. of Connecticut and Beth Bishop, Michigan State.

PLECTOSPORIUM BLIGHT OF CUCURBITS

Plectoporium blight (Microdochium blight) caused by *Plectosporium tabacinum (Microdochium tabacinum)* was first observed in Tennessee in 1988 and has since been reported throughout pumpkin growing regions of the United States. The most susceptible cucurbits to Plectosporium blight are pumpkin, yellow squash, and zucchini.

Plectosporium tabacinum is a common fungus in the soil and on decaying plant material and is favored by warm, wet weather. The spores are spread by rain-splash and wind. Plectosporium blight is known to cause damage to a variety of cucurbit crops in Europe and Asia, but the strain present in the U.S. seems to primarily damage pumpkins, summer squash, zucchini and a few varieties of gourds. Last year it showed up on *Cucurbita moschata* (butternut family) and *Cucurbita maxima* (hubbards, buttercup, giant pumpkins, etc), so it is likely that the US strains are jumping species and will become a threat to previously immune crops. In wet years, which favor disease development and spread, crop losses in no-spray and low-spray fields can range from 50 to 100%. Fortunately, this disease is easily recognized and can be effectively managed.

Plectosporium blight sympltoms on zucchini

Description and Management

Spindle shaped lesions of Plectosporium blight

Plectosporium blight is favored by cool, rainy weather. The fungus can overwinter on crop residue and can persist in the soil for several years. Plectosporium has not been reported to be seed-borne. Tiny spores are formed in lesions on vines, stems, fruit, leaves and leaf petioles. Spores can be dispersed by wind over long distances. Lesions are small (<1/4 inch) and white. On vines, petioles and leaf veins, the lesions tend to be diamond to lens-shaped; on fruit and leaves lesions are usually round. The lesions increase in number and coalesce until most of the vines and leaf petioles turn white and the foliage dies. Severely infected vines become brittle and will shatter if stepped on. Early in the infection cycle, foliage tends to collapse in a circular pattern before damage becomes more universal throughout the field. These circular patterns can be easily detected when viewing an infected field from a distance. Numerous fruit lesions produce a white russeting on the surface and stems that render the fruit unmarketable. To scout for Plecto early in the season, part the leaves of the canopy and look at the main large vine of the plant that runs along the ground...that is where Plecto tends to show up first.

- When Plectosporium blight occurs, rotate away from summer squash and pumpkins for two years.
- Choose sunny, well drained sites for cucurbit production.
- No resistant cultivars of pumpkins have been reported.
- Scout for disease and apply protectant fungicides when the disease first occurs. The disease is readily controlled by fungicide applications. Thorough coverage of foliage, vines, and fruit is necessary for good control.

Chemical Controls

Chlorothalonil (i.e. Bravo) and strobilurin fungicides (Pristine, Cabrio, Flint, Amistar = Quadris) are the most effective at controlling Plectosporium blight. However there are several other important factors that must be considered when designing spray recommendations such as, control of other important cucurbit diseases, resistance management, and spray coverage. The strobulurin fungicides are also usually the best weapon against powdery mildew, and should only be used once per season to delay resistance. With that in mind, it is best to hold off on spraying the stobulurin fungicides for plectosporium until such time as it can also be used as your first spray for powdery mildew. In addition, systemic fungicides should be combined with a contact fungicide like Bravo or Maneb to help delay resistance. The following materials are available for controlling plectosporium in cucurbit crops.

- azoxystrobin (Quadris): 11.0 to 15.4 fl oz/A (o dh, REI 4 h). Apply at the first sign of disease and repeat with a fungicide other than a strobilurin in 7-14 days. Do not rotate with Flint or Cabrio.
- chlorothalonil (Bravo): 1.8 to 2.7 lb/A (0 dh, REI 12 h). Apply when conditions are favorable for disease development. Repeat no sooner than a 7 day interval. Do not apply more than 19.1 lb/A per growing season.
- maneb/ mancozeb (Maneb, Penncozeb, Manzate Dithane): Rates vary depending on formulation. See label. (5 dh, REI 24 h).
- pyraclostobin (Cabrio EG 20 %): 12 to 16 oz/A (0 dh, REI 12 h). Apply at the first sign of disease and repeat with a fungicide other than a strobilurin in 7-14 days. Do not rotate with Flint or Quadris.

Where trade names or commercial products are used, no company or product endorsement is implied or intended. Always read the label before using any pesticide. The label is the legal document for product use. Disregard any information in this newsletter if it is in conflict with the label.

-T. Jude Boucher, University of Connecticut, Cooperative Extension System; M. Bess Dicklow, UMass ExtensionCompiled by Andrew Cavanagh, Umass Extension

CUCURBIT DISEASE MANAGEMENT

Managing cucurbit diseases is an increasingly complex and sometimes daunting task. Recent years have seen plectosporium blight added to the list of diseases afflicting these crops. Downey mildew has become more of problem for many growers since 2004. Phytophthora is an ever increasing problem with no good solution. In addition, there is the very real danger of losing our most effective materials to resistance. The following article aims to provide some guidelines for making decisions about your spray schedule that will allow for the best control with the least danger of contributing to fungicide resistance.

Systemic fungicides provide the best control of many cucurbit diseases because they provide protection to both the upper and lower leaf surfaces. However, systemics have one mode of action per fungicide group and tend to have more problems with resistance than contact fungicides, which provide multi-site activity against diseases. Systemic fungicide resistance can occur in a single season if the product is overused. Once a disease organism develops resistance to a systemic material, the pathogen may quickly become resistant to other products in the same fungicide group (i.e. stobilurins). As a result, newer materials that have not been exposed to disease organisms as long usually tend to work better than older products, but not for long. In contrast, many contact fungicides have been used for decades without experiencing resistance problems. Although stobilurin fungicides have been some of the most effective materials available in recent years for most cucurbit diseases, powdery mildew and black rot have already developed resistance to stoblilurins in some states, and resistance for downy mildew has occurred outside the U.S. The best resistance management strategy to help preserve the

useful life of the systemics is to make a single application from each effective fungicide group (anilide, stobilurin and DMIs) in a given season. In addition, pathologists are now recommending that all systemic materials be applied with a contact fungicide to help slow resistance development.

Chlorothalonil (i.e. Bravo) is effective at controlling Plectosporium blight but does not work as well as many systemic fungicides on powdery mildew. It can be mixed with systemics, such as the DMIs, myclobutanil and triflumizole (Nova or Procure), or protectants like sulfur (i.e. Microthiol Dispress) which work well on powdery mildew but do not control Plectosporium blight or other important cucurbit diseases.

Contact fungicides such as copper hydroxide and maneb may aid in the control of Plectosporium blight and possibly other diseases, but they don't have the efficacy to provide sufficient protection when used alone. So, fungicides must be mixed or alternated to produce a combination that will provide a full range of disease protection. Systemics must be alternated with fungicides outside of their group to prevent the build up of resistance. In addition, copper can cause phytotoxicity in many new varieties of pumpkins.

Scout pumpkin and summer squash plantings weekly for symptoms of both Plectosporium and powdery mildew. Examine the lower surface of 50 leaves for small (1/4"), white powdery mildew colonies and all plant parts for Plectosporium lesions. If powdery mildew is detected first, begin your spray schedule with a strobulurin type mixed with a contact fungicide. We are recomending Pristine, as it is more effective against strains that have developed resistance to Quadris and older stobulurins. Pristine contains boscalid, a new effective systemic material for powdery mildew control, and pyraclostrobin, the same active ingredient found in Cabrio (Anilide + Strobilurin groups). Follow this with a DMI type fungicide (Procure or Nova). These materials are also systemic, and also should be mixed with a contact fungicide. Applications should be applied 7-10 days apart, and should be limited to a single application per season for each fungicide group.

All systemic sprays should be applied with a contact fungicide (e.g. chlorothalonil, copper or maneb). Sulfur (i.e. Microthiol Dispress) and chlorothalonil (i.e. Bravo) can be used alone for late-season sprays to rest the systemic materials and still provide effective control of Plectosporium blight, powdery mildew, black rot (GSB) and scab. If downy mildew is found prior to September, other systemics (i.e. Ridomil/Bravo) may be needed with sulfur late in the season. There is no need to control downy mildew on pumpkins during September, because this disease only affects leaves and not fruit.

If Plectosporium blight is detected before powdery mildew, apply chlorothalonil (i.e. Bravo) on a weekly basis until powdery mildew is found. In the unfortunate circumstances that Downey Mildew shows up before Powdery Mildew, we would recommend Tanos (famoxadone and cymoxanil) mixed with either Bravo or Maneb alternated with Ridomil Gold/Bravo. That would provide protection from plectosporium as well as taking care of the Downey Mildew.

Caution: do not apply sulfur if temperatures exceed 90 degrees F, before/with/after oil applications, or to melons due to phytotoxicity problems.

In unusually wet weather, in unrotated fields, or if Plectosporium is detected before powdery mildew, start your spray program as soon as the disease is detected or at fruit set. Scout your fields weekly for symptoms of Plectosporium blight and powdery mildew. Apply chlorothalonil (i.e. Bravo) every 7-10 days until powdery mildew is found during weekly scouting trips. Then add a systemic material or sulfur to the spray mix for mildew control, taking care to alternate between fungicide groups to help prevent resistance. Copper or maneb can be used with the strobulurin application to rest Bravo. Crop rotation is an essential component of this management program. Thorough coverage of the foliage and fruit with 40+ gallons of water per acre is recommended.

Where trade names or commercial products are used, no company or product endorsement is implied or intended. Always read the label before using any pesticide. The label is the legal document for product use. Disregard any information in this newsletter if it is in conflict with the label.

-T. Jude Boucher, University of Connecticut, Cooperative Extension System; Adapted by Andrew Cavanagh, University of Massachussetts Extension Service

Trap Counts for June 28th, 2007

Location	ZI	EII	Total ECB
South Deefield	0	4	4
Deerfield	4	2	6
Sunderland	0	0	0
Hadley (2)	1	1	2
Whately	2	20	22
Hadley (1)	4	0	4
Amherst (1)	0	2	2
Amherst (2)	0	0	0
Easthampton	3	2	5
Southwick	0	1	1
Lancaster	6	0	6
Concord	4	6	10
Spencer	1	0	1
Northbridge	1	0	1
Tewksbury	16	0	16
Tyngsboro	0	10	10
Still River	1	1	2
Litchfield, NH	0	1	1
Hollis, NH	0	5	5
Mason, NH	0	1	1

--Thanks to our scouting network: R.Hazzard, P.Westgate, A.Brown, A.Lopez-Swetland, D.Rose, J.Golonka, S.Pepin, G.Hamilton, P.Willard, J.Mussoni

Sweet corn

This week people have gotten their irrigation equipment out to try and remedy some of the drought that is occurring across the state. We have seen all early plastic and transplanted corn go into silk. It appears as though some growers will have corn ready for the holiday next week, or for the weekend after the fourth of July. With all of the silk out there people should be thinking about monitoring for corn earworm. We have caught our first small flight (Hadley, 1 moth per night), but all other locations in the Connecticut Valley, Central and Eastern Mass. reported zero CEW moths this week. It is possible that the storm that is heading up the coast will carry moths with it. This is a great reason to have your own trap up!

CEW moths do not overwinter in New England, but migrate annually to the Northeast traveling north on storm fronts. Heaviest numbers are found in coastal areas and up the major river valleys. Knowing this we can expect higher numbers in traps next week especially if you are in a more susceptible area. If you are worried about encountering a CEW infestation this year get your traps up as soon as possible!

Monitoring moth flight is critical to achieving CEW control all season long. Trap counts can jump overnight and sprays must be timed to prevent larvae from entering the ears. Traps should be placed in fields as soon as plants start silking and moved to fresh silk as necessary. Adult moths lay eggs directly on the fresh silk of the newly developing ears. Eggs will then hatch in 2-6 days depending on temperature (2.5 days at 90 degrees F and over, 6 days as the temperatures drop below 60 degrees F). The newly hatched larva will travel down the silks and then tunnel into the ears. Once they are in the ear, insecticides will not be able to reach the caterpillars. The larva must be controlled before they enter the ears. See the table below for CEW thresholds and spray intervals.

European corn borer flight is declining and we are approaching the end of the first generation flight. Where ECB flight remains over 7 moths per week, and corn is more than one week from harvest, silking corn should corn should be sprayed on a weekly basis to protect from borers that may hatch near the ear zone and go directly into the ear. However, fewer new egg masses will hatch as flight declines. Borers are present in emerging tassels. This week we found some fields above threshold, and some below. Scout and spray if > 15% infested.

CORN EARWORM THRESHOLDS

Moths/Night	Moths/Week	Spray Interval
0 - 0.2	0 - 1.4	no spray
0.2 - 0.5	1.4 - 3.5	6 days
0.5 - 1 day	3.5 - 7	5 days
1.0 - 13.0	7 - 91	4 days
Over 13	Over 91	3 days

Note: spray intervals can be lengthened one day if daily temperatures are below 80 degrees F.

-Amanda Brown, UMass Extension

Vegetable Notes is funded in part by a grant from the EPA Region I Environmental Stewardship Program, through the New England Vegetable and Berry Growers Association.

Vegetable Notes, Ruth Hazzard, editor and Amanda Brown and Martha Powers, assistant editors. Vegetable Notes is published weekly from May to September and at intervals during the off-season, and includes contributions from the faculty and staff of the UMass Extension Vegetable Program, other universities and USDA agencies, growers, and private IPM consultants. Authors of articles are noted; author and photographer is R. Hazzard if none is cited.