

Horticultural Inspection Society Central States Chapter

Making Professionalism a Part of Every Effort

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PRESIDENTS MESSAGE

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33ND ANNUAL HORTICULTURAL INSPECTION SOCIETY
CENTRAL CHAPTER MEETING,
MADISON, WISCONSIN - OCTOBER 2003

Thad Kohlenburg - HIS - Central States Chapter President,
Wisconsin Department of Agriculture, Trade and Consumer Protection

The Horticultural Inspection Society,
(HIS) Central Chapter Annual In-service
Training was held in Madison Wisconsin,
October 21st and 22nd, 2003. Nine of the
thirteen Central Plant Board states were
represented. Members presented state
reports and conducted informal
presentations featuring insect and
disease pests. Thanks to all who
attended and Wisconsin DATCP staff who
worked to make this an excellent training
and networking opportunity.



The following were topics covered during formal training.

Nick Neher, Division Administrator and Ester Chapman, Bureau
Director from the Wisconsin Department of Agriculture, Trade and
Consumer Protection WDATCP welcomed the group.

Dr. Phil Pelitteri - Entomologist and Director of the University of
Wisconsin Insect Diagnostic Lab presented information on various
insect pests that have been causing damage in Wisconsin nurseries.
Clearwing borers attacking viburnum's and oaks, Linden borer
attacking mature linden trees, honey locust borer and oak sapling
borer were among the insect pests discussed in detail. Dr. Pelitteri
discussed distorted growth on arborvitae.

MEMBER STATES

Illinois,
Indiana,
Iowa,
Kansas,
Kentucky,
Michigan,
Minnesota,
Missouri,
Nebraska,
North Dakota,
Ohio,
South Dakota,
Wisconsin

Summary Continued on Page 2

2003 meeting Summary
Continued from Page 1

Dr. Glen Stanosz, Plant Pathologist, U W-Madison, currently teaches students in horticulture, landscape architecture, and forestry, as well as professionals in the "green industry" and does research on fungi and the diseases they cause on forest and landscape trees and shrubs. Dr. Stanosz presented practical lessons from Sphaeropsis shoot blight and canker research which includes work with latent infections. This destructive disease of pine can be found in seedlings that are not showing symptoms. This makes inspection and certification very difficult. Seedling mortality is greatly increased when plants are stressed as when they are transplanted. Chemical control has proven ineffective. The best management strategy is to reduce the source of fungal inoculum by removing nearby infected trees. Nurseries that have been identified with this problem have had pine windbreaks infected with Sphaeropsis surrounding seedling production areas. Removing these infected trees should reduce the incidence of disease. He also discussed diagnosis and treatment of Chryomyxa weirii - a newly recognized rust disease threat to spruces in the Midwest.



Photo - Bob Dahl

Brian Swingle is the Executive Director for the Wisconsin Nursery Association and the Wisconsin Landscape Federation. Brian led an informal discussion titled "We're all in this together! The importance of a partnership and attitude between Industry and Regulators". He focused on the importance of industry and regulatory officials working together to solve plant pest regulatory problems. State inspectors work closely with their respective state associations and discussed the many different ways they work to maintain effective communication and positive working relationships. It was very interesting to note that most states do work closely with, have educational outreach programs for and have generally good working relationships with their respective industries. All agreed these relationships are very important for both state agencies and industries. It was great to see and compare different techniques.



Photo - Bob Dahl

Dr. Caitilyn Allen is currently a professor and researcher of Southern Wilt, Ralstonia at University of Wisconsin-Madison. She has been working with Ralstonia for 15+ years and is currently part of a group who is looking at Goldsmiths production facilities overseas and suggesting improvements. She discussed Bacteria, Bioterrorism and Geraniums; lessons learned from 2003 bacterial wilt outbreak on Geraniums. Following Dr. Allen's presentation, there was a spirited discussion of the federal involvement in eradicating this Ralstonia introduction as well as state-federal roles in plant pest regulatory issues.



Photo - Bob Dahl

Dr. Brian Huddelson, Director of the UW Plant Disease Diagnostic Clinic since 1998 Presented Diseases in the Nursery: Perspectives from the UW Plant Disease Clinic. Dr. Huddelson detailed: emerging diseases: foliar nematodes and Wiers

cushion rust, production diseases: root rots and southern blight, and post installation diseases like Cytospora canker of spruce. He provided diagnostic and possible management strategies.

Bill Hilbert Receives Carl E. Carlson Distinguished Achievement Award

Bill Hilbert, Kansas Department of Agriculture has been awarded the Carl E. Carlson Distinguished Service Award. This award was created in memory of Carl E. Carlson who at the time of his sudden death was director of the Iowa Plant Industry Division. The award is presented annually by the National Plant Board (NPB) to a plant protection specialist. Each plant board submits a candidate and the winner is chosen from one of the four.

The award is in recognition of distinguished achievement while consistently upholding the principles of plant protection and quarantine and the ideals of the NPB in serving the citizens and industries regulated and contributing to the health and welfare of plant environment nationwide. Bill has been with the Kansas Department of Agriculture since 19XX and has been a driving force behind the success of the Horticultural Inspection Society, (HIS) Central States Chapter. He has coordinated the development, revisions, printing and distribution of the HIS Inspection Manual. He received the Robert McAdams award from the Central Chapter HIS in 2002 and was this group's nomination for the 2003 Carlson award. Special Congratulations to Bill from the HIS, Central Chapter.

Bill Hilbert's Remarks:

I was very honored to receive this award. Anytime you are recognized by your peers it is a special feeling, but to be recognized by your peer's program managers is extremely special.



I was fortunate enough to know Carl Carlson personally. Shortly after I began my employment with the Kansas Department of Agriculture Carl was working with USDA/APHIS/PPQ and gave me my first export certification training. A few years later when he became employed by the Iowa Department of Agriculture our paths crossed more frequently and we shared some mutual hobbies and became professional friends.

If it had not been for Carl the HIS Nursery Inspectors Guide may never have been created. He was extremely favorable of developing this publication and supported it tremendously and was heavily involved in getting the first edition developed.

Therefore; it was with great honor I accepted this distinguished award.

Potato Leafhopper, *Empoasca fabae* (Harris)

Order Homoptera, Family Cicadellidae

John Crouch - Regional Entomologist, Iowa Department of Agriculture and Land Stewardship

Hosts

Legumes such as soybeans, clovers and alfalfa as well as trees such as chestnut, birch, apple, Norway and sugar maples. Red maple and river birch are extremely susceptible to injury.

Description

The adult potato leafhopper is approximately 1/8 inch long, wedge-shaped and pale green with white eyes. The wings are held roof-like over the body. There are a number of white spots on the head and thorax and a row of six rounded white spots along the anterior margin of the prothorax. The hind legs are long enabling the insect to jump a considerable distance.

Distribution

The potato leafhopper occurs predominantly east of the 100th meridian (a line from Corpus Christi, Texas to Winnipeg, Canada). It cannot overwinter in the north because of the sensitivity of the eggs to cold temperatures. It may be found year around near the Gulf of Mexico. It appears rather suddenly in the north in late April to early June traveling from the gulf states on wind currents and storms. Upon arriving in northern regions, it seems to be attracted to alfalfa. After the first cutting of the alfalfa, the leafhopper migrates onto ornamental hosts including nurseries.

Damage

The potato leafhopper feeds in the vascular tissue, primarily the phloem. It produces a proteinaceous fluid that lines the holes produced by the probing stylet mouthparts. The fluid solidifies in the hole

forming a sheath. The sheath remains after the insect removes its stylet. Because the feeding site and the sheath are not visible to the unaided eye, there is no primary injury symptom.

As the stylet probes the plant tissue, internal cells are lacerated and cell fragments or parts of the

stylet sheath, clog the sieve tube. Toxins injected into the tissue along with the physical disruption by the stylets may cause cells to collapse or contents to coagulate. This causes the marginal burn or browning of the leaf edges often referred to as "hopper burn". Wilting may also occur as xylem vessels are punctured and sieve tubes are plugged by sheath and cell debris.

When vascular tissue is damaged in shoots, the adjacent tissue swells causing abnormal physiological reactions that

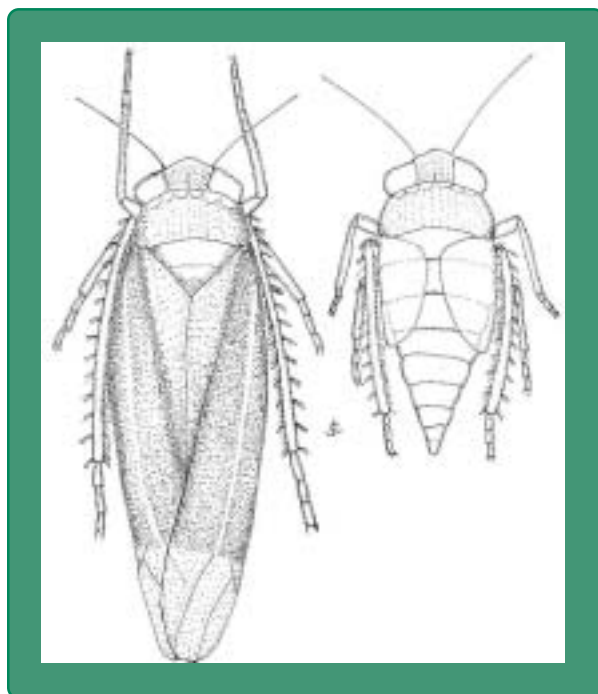
reduce the shoot's ability to harden off for winter. Many of these shoots do not survive the winter or are weakened and do not regain their vigor.

Life Cycle

Eggs are deposited in slits cut in leaf veins on the underside of leaf blades or in petioles. The eggs hatch in 6 to 9 days into green nymphs that are found on the undersides of leaves. The nymphs tend to move sideways when disturbed; they undergo five instars of growth before molting into adults. Six generations may occur in Virginia, and three to five in Illinois.

Inspection Tips

Look for small yellow-green to red colored downward-cupped leaves on the terminal growth of red,



sugar and Norway maples. On birch, chlorotic and stunted terminal growth is an indicator of potato leafhopper damage.

Control

Control can be obtained with pyrethroids such as bifenthrin (Talstar), cyfluthrin (Tempo), lambda-cyhalothrin (Scimitar) and permethrin (Astro). Insecticides must be applied before leafhoppers can cause damage, however if damage has already occurred treatment will prevent further damage and protect new growth.

References:

Cloyd, R.A., 2002 Potato Leafhopper, Home, Yard & Garden Newsletter, University of Illinois Extension, Urbana-Champaign, Illinois.

HIS Treasurer, Bria Radtke Accepts New Position and Hands Over "The Books"

Thad Kohlenberg - Wisconsin DATCP

Bria Radtke, our HIS treasurer from the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) has accepted a position with the Wisconsin Department of Natural Resources effective January 15th of this year.

Bria had been with DATCP about 5 years. During that time she worked in many programs. She was the Christmas tree license coordinator for the state and helped to set up the licensing of the Christmas tree industry. She served as the Treasurer for HIS in 2003 and helped with the annual meeting held in Madison.

Bria accepted a position with the Wisconsin DNR working as a Regional Gypsy Moth Suppression Coordinator working in the Eau Claire office. She will likely be working in cooperation with DATCP on some Gypsy moth projects. Good luck to her in the new job!

Ken Cote from Indiana volunteered to take over HIS Treasurer duties. Thanks Ken!



Crouch, J.R., Field Notes

Johnson, W.T. and H.H. Lyon, 1991, Insects That Feed on Trees and Shrubs, Ithaca, New York: Cornell University Press.

Metcalf, C.L. and W.P. Flint; revised by R.L. Metcalf, 1962, Destructive and Useful Insects, New York, New York: McGraw Book Company

Weiser, L.A., Research Notes, Graduate Student at Iowa State University, Ames Iowa.

Prepared by John R. Crouch, Regional Entomologist, Iowa Department of Agriculture and Land Stewardship.

Planning is Underway for
2004 Annual HIS Meeting
Indianapolis, Indiana
Scott Kinzie - Indiana DNR -
skinzie@dnr.state.in.us
317-232-4120

The meeting will be at the Radisson Hotel in Downtown Indianapolis, October 26-28th. Room rates. \$87. Reservations: 317-635-2000 ext. 1000 or 1-800-333-3333. I have some speakers confirmed and I am working on a preliminary agenda. They include:

1. Sod/turf diseases - focused on the states in our region.
2. Emerald Ash Borer and other exotics we should look for.
3. A lab/workshop on both diseases and insect pests presented by Purdue University. I want to encourage all who attend to bring in samples - these can be discussed as well during the workshop.
4. Asian Ambrosia Beetle - found in an Indiana nursery the past two seasons. The talk will focus on our survey work.

There will be more of course, but these are confirmed for the meeting. We are thinking of a field trip to a unique greenhouse in Indianapolis that uses the city landfill for heat - it's quite interesting - but it's not confirmed yet.

MINUTES OF THE HORTICULTURAL INSPECTION SOCIETY (H.I.S.),
CENTRAL CHAPTER, BUSINESS MEETING, THURSDAY, OCTOBER 23, 2003

H.I.S. President, Steven Shimek, MN, called the 2003 business meeting to order at 8:25 a.m.



HIS Secretary,
Susan Ehlenbeck, MO

Roll call was given by Susan Ehlenbeck, MO, H.I.S. Secretary. States present: Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, and Wisconsin. States not present: Ohio, North Dakota, and South Dakota.

Minutes from the 2002 H.I.S. business meeting were distributed. A motion was made by Cheri Copeland, KS, and seconded by Bruce Cummings, IN, to approve the 2001 minutes. Motion carried.

The Treasurer's Report was given by Treasurer, Bria Radtke, WI,

Balance forward (03-26-2003) \$5288.24
(Treasurers Report 03-26-03 through 10-20-03)

Income:
Dues Paid, Meeting Registration \$716.00
Manual Sales, other \$525.00
Total Income \$1241.00

Expenses:
Bob McAdams Award 39.93
Bill Hilbert-attend National Plant Board Meeting/Carlson Award 448.50
Postage and delivery 76.08
Total Expenses \$ 564.51

Total Income less Expenses \$676.49
Balance forward 03-26-03 5288.24
Income less Expenses + 676.49
Balance forward 10-20-03 \$5964.73
HIS Manual Inventory 9(@ 50.00 ea) 450.00

A motion was made by Lee Burgess, MO, and seconded by Steve White, KS, to accept the Treasurer's report. Motion carried.

OLD BUSINESS

AUDIT COMMITTEE

The 2003 Audit Committee was comprised of Larry Hanning, MD, Joe Collins, KY, and Dave Johnson, MO. Larry Hanning reported that all of the treasurer's books are in excellent order.



Larry Hanning, MO

The committee added a recommendation that a hard copy report of treasury activities should be made available to the audit committee for that period from the last audit until the new treasurer assumes duty. They added that the overall record keeping system which was developed by this treasurer was exceptionally clear and well done.

CENTRAL PLANT BOARD
MEETING REPORT, Illinois,
FEBRUARY, 2003

Joe Collins, KY, reported that he had attended Central Plant

Board Business Meeting, but did not bring notes as he was not the appointed attendee. He did remember there were a few diseases discussed at the meeting, but no major issues which needed to be addressed.

2003 INTERSTATE GROUP INSPECTION

The 2003 interstate group inspection was not held this year due to budget cuts. An interstate inspection in March/April 2004 will be planned in the Council Bluffs area of Iowa possibly at Dallas/Johnson Greenhouse (Color Inc).

NURSERY INSPECTORS GUIDE (MANUAL)

Bill Hilbert, KS, reported that there were currently 9 manuals in inventory, and that 13 guides had been sold this year. He reported that the Emerald Ash Borer addition was complete and that the Beech Borer addition is in progress.

Bill suggested that some of the information in the manual may need some revisions or updating. He added that he could send copies to members so we can review and update where needed. He gave a suggestion of PDF file (electronic format) of the manual. Steven Shimek, MN, suggested that the authors of the articles be contacted to update their information as

needed. He also suggested that new additions could be sent via pdf file instead of mailing hard copy, so that each state or inspector could print their own not have to be billed and not being reimbursed for printing

WEBSITE AND INTERNET EMAIL LISTSERVER

Steve White, KS, reminded the group that our website address is: www.grapevine.net/~scwhite/ his and that this website does have public accessibility. He referred members to the website if they needed written help to get signed up for the webgroup as there are many dues paying members that had not yet subscribed. He also explained that members could email him for further help if needed. Steven Shimek, MN, encouraged members to make use of this valuable tool for communication between our members. He also asked that each state email their state reports to him or Steve White so they can be added to the website/newsletter.

ROBERT MCADAMS AWARD NOMINATION/CARL CARLSON AWARD

Vicky Wohlers, NE, was awarded the Robert McAdams H.I.S. Award as per her selection at the 2002 meeting (she was not present to be

given the award in person at this meeting).

A single nomination was presented to the chapter. Bill McAdams, Iowa was unanimously nominated for, and voted to be this year's recipient of the Robert McAdams Award. Bill was not available to accept the award at the business meeting. His name will be forwarded to the Central Plant Board president as our suggested nominee for the Carl Carlson Award. Bill Hilbert, KS, encouraged members to send letters of recommendation to Joe Collins, KY, or Mike Brown, MO as members of the necrology committee of the Plant Board, as Bill McAdams no longer has a supervisor to do this.

H.I.S. STANDARDIZATION OF NURSERY INSPECTION TECHNIQUES COMMITTEE REPORT

The H.I.S. Standardization of Nursery Inspection Techniques Committee consists of Vicki Wohlers, NE; Charles Fariss, MI; Bill Hilbert, KS; Bill McAdams, IA; Don Orton, IL; and Chuck Stoltenow, IA. Several of these members have changed positions or are retiring, and there was no further report to the organization.

NEW BUSINESS

RESOLUTIONS COMMITTEE

The 2003 Resolutions Committee was comprised of Bill Hilbert, KS, Nellie Brown, MO, and John Harri, IA. Bill Hilbert read the following resolutions:

RESOLUTION #1

Whereas, the 33rd annual in-service training of the Horticultural Inspection Society, Central Chapter was held in Madison, Wisconsin, on the 20th through the 23rd of October, and whereas, the meeting was hosted by the Wisconsin DATCP and whereas, the meeting accommodations and program were of excellent quality.

Therefore, be it resolved that the Horticultural Inspection Society, Central Chapter wishes to express its appreciation and sincere thanks to the Wisconsin Department of Agriculture, Trade and Consumer Protection, and its staff especially Thad Kohlenburg, Bria Radtke, Bob Dahl, Greg Helmbrecht, Stacy Chic, Konnie Jerabek, John Domino, Sara Ott, and Paula Noel, who made the 33rd meeting a success. Adopted: October 23, 2003

RESOLUTION #2

Whereas, the 33rd annual in-service training of the Horticultural Inspection Society, Central Chapter was held in Madison, Wisconsin, on the 20th through the 23rd of October, and whereas, the state of Minnesota graciously provided transportation and drivers during the annual meeting.

Therefore, be it resolved that the Horticultural Inspection Society, Central Chapter wishes to express its appreciation to the Wisconsin Department of Agriculture, Trade and Consumer Protection. Adopted: October 23, 2003

RESOLUTION #3

Whereas, the 33rd annual in-service training of the Horticultural Inspection Society, Central Chapter was held in Madison, Wisconsin on the 20th through 23rd of October and whereas the State of Wisconsin DATCP provided excellent food and decorations for the hospitality and meeting rooms during the annual meeting. Therefore be it resolved that the Horticultural Inspection Society, Central Chapter wishes to express its appreciation to Wisconsin Department of Agriculture Trade & Consumer Protection. Adopted: October 23, 2003

Julia VanMeter, NE, made a motion to accept the

resolutions as read. Julia Thompson, MO, seconded. Motion carried. Steve Shimek also added a personal thanks to Wisconsin's DATCP and Thad Kohlenburg for the efforts put into the meeting.

NOMINATIONS COMMITTEE AND 2004 HOST STATE

The 2003 Nominations Committee presented the following list of suggested officers for next year:

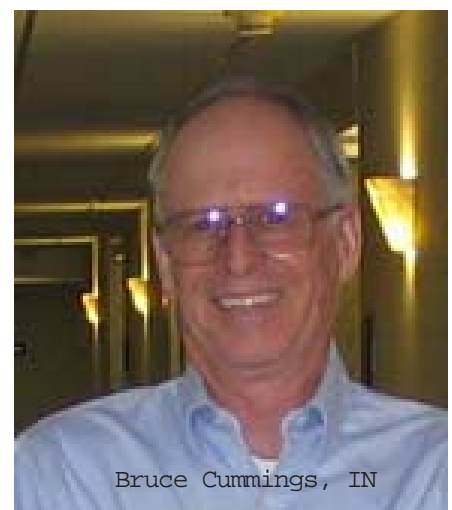
President:
Thad Kohlenburg, Wisconsin

Vice President:
Scott Kinzie, Indiana

Secretary:
Susan Ehlenbeck, Missouri

Treasurer:
Bria Radtke, Wisconsin

Editor:
Steve Shimek, Minnesota



Bruce Cummings, IN

A motion to accept nominations as read was made, seconded, and passed.

Bruce Cummings, accepted for Indiana to host the 2004 H.I.S. Central Chapter meeting. He said they would get back to the group with tentative dates and locations.

H.I.S. CENTRAL CHAPTER REPRESENTATIVE TO THE CENTRAL PLANT BOARD MEETING

Julie VanMeter, said that she would be willing to be the H.I.S. Central Chapter representative in 2004 to the Central Plant Board meeting in Nebraska and then report back to us during our next business meeting.

HONORARY MEMBERS

Susan Ehlenbeck, secretary, read a list of names to be nominated as honorary members to our organization as they had either retired or went to another position (and the person nominating felt they deserved to be given honorary status due to the continued service provided to the organization). The names were Joe Francka, MO, Bill McAdams, IA, KO Bell, KS, and Clarence Dunbar, IN.

Julia Thompson, MO then made a motion to accept the members on the list as Honorary Members of the Horticultural Inspection

Society, Central Chapter. The motion was seconded and passed.

OTHER BUSINESS

Susan Ehlenbeck, secretary, mentioned that there was still a need to get others further involved in the organization for benefit of all members. She explained the value added benefit of the ability to communicate through the list serve and encouraged others to use this benefit on a regular basis. Susan also encouraged attending members to invite new inspectors, remind experienced inspectors of the value of attending the training session and meetings, and when possible, remind supervisors of the benefits of our continued training such as our organizations gatherings.

Jan Ryan, MI, asked if there could be a letter developed to give to new inspectors that existing members could give to them while inviting them to be a member of H.I.S. Susan mentioned there is already one made, and that she sends them out when she hears from others that there are changes in personnel, and encouraged members to keep her informed of these changes. She added that she sent special invitation letters to new members and several state entomologists describing the benefit of the meetings/ membership.

Julie VanMeter, NE, made a motion to form a membership committee (to get more people involved, and keep this from becoming an additional responsibility of the secretary). Steve White, KS, seconded the motion. A discussion of ideas included ways to encourage new members to join and encourage existing members to get more involved. Motion passed. Ryan Krull and Julie VanMeter, NE, and Steven Shimek, MN, volunteered to be on the group. Julie encouraged everyone to include their inspectors contact information on the state report.

Bill Hilbert and Steve Shimek offered estimated prices for lapel pins as was discussed during last years meeting. Both had comparable price for around \$2.00 cost depending on number of colors and quantity ordered. Steven's estimate was slightly less, so he said he could further pursue it. Susan Ehlenbeck suggested that he send a picture of the design via the list serve, then we could vote on it and have the pins available at the next meeting. Julie VanMater suggested that everyone be given a "certificate of Membership" as many other organizations do, and that possibly the membership committee could do this. Cherie Copeland, KS,

suggested shirts instead or along with pins, or offer the shirts for sale and give pins to new members. She said she would look into prices and get back to the group. It was decided to allow each person who volunteered suggestions to look into the prices of each option then vote via email.

A suggestion was made by Todd Voss, IA to send a copy of contact information to dues paying members. Julie VanMeter, NE mentioned that many of the state reports had this information, and encouraged others to do the same. Steve White, KS, suggested that once the information for the year had been compiled by the secretary and treasurer, he could send it to the list serve so it could be available to all who were signed up.

Steven Shimek announced to the group, the decision made by the executive committee to provide monetary support to Bill Hilbert for his plant ticket, so that he could accept his Carl Carlson Award in person at the National Plant

Board Meeting. Bill Hilbert, thanked the group for monetary support and expressed his gratitude for the nomination. Susan Ehlenbeck thanked Steven Shimek, for all the work put into the meeting, and into the organization through the year.

Steve Shimek, president, thanked the officers for their work throughout the year. The gavel was passed to the new H.I.S., Central Chapter President, Thad Kohlenburg, WI. Thad thanked Bob Buhler, Esther Chapman, and the Wisconsin staff who helped with the meeting.

A motion was made by Cheri Copeland, KS, and seconded by Joe Collins, KY, to adjourn the meeting. Motion carried.

Meeting adjourned at 9:30 a.m.

Respect fully submitted,

Susan Ehlenbeck
H.I.S. Central Chapter Secretary

Plant Protection Pictionary

HIS Meeting,
Madison, Wisconsin

Dave Johnson
takes a turn drawing.

Konnie Jerabek distributes
donated door prizes.

Konnie, Bria and Bill
Hilbert enjoy the game.



Photo - Bob Dahl

Bill McAdams
gets the answer

The following was found in the HIS archives from a Tree Stress workshop in Missouri in 1978 presented by the University of Missouri Forestry Staff.

Submitted by Bill Hilbert

Editors Note: Although this may have been new information in 1978, most has withstood the test of time and have become truths we "hold self-evident" .

Chemical Injury - Captan may injure the roots of growing trees.

2,4-D should be applied to lawns with trees in the summer rather than early spring, tree root activity is highest in early spring, thus greater injury. Besides the usual 2,4D damage symptoms this chemical can cause bark bleeding.

Pollution - One of the most sensitive indicators to sulfur dioxide is alfalfa. White pine is very sensitive and easily injured by sulfur dioxide, resulting in chlorosis and smaller needles. The reason conifers are more often hurt than deciduous trees is that they keep their leaves, allowing higher toxic levels to accumulate, and adding fertilizer or nitrogen to sulfur dioxide damaged trees may be detrimental, actually causing an increase in the pollution symptoms.

Drought - In the Midwest, one of the first forest indicators of drought is dogwood; dogwood leaves will wilt before most other species. Oak probably wilts the least, and many oaks will be near death before the leaves will wilt.

To prevent desiccation during dormant periods, mulch, use anti-transpirants and wind screens. There is some evidence that anti-transpirants used during the growing season will interrupt the photosynthetic process.

Transplanting - When transplanting with mechanical diggers or an means, it is very beneficial to root prune; even a couple of months ahead of time will help. It is possible that liquid applications of fertilizer and rooting

hormones might enhance root development after root pruning. In general, when roots are actively primary roots are more important than secondary roots, but get as many of all roots as possible.

The most successful times for transplanting is in the fall before heavy freezing; species such as Fagus, Magnolia, Cornus, and Liquidambar do best when transplanted in the spring.

The roots of oak continue to grow during the dormant period until temperatures drop below 38 degrees F; this temperature varies with other species. Mulches are very helpful and may aid root development in the fall by keeping the soil temperature warmer a little longer.

Tree Wounds - Trees do not heal wounds! A tree is a compartmented plant that compartmentalizes injured and infected wood. Think of a battleship with its many compartments; when a torpedo hits below the water line numerous compartment doors are shut as quickly as possible, resulting in a minimal amount of flooded compartments

The idea that a tree can develop "heart rot" which will spread year after year is a myth. What we see in a rotted tree hole is that part of the tree which has been compartmentalized, and unless this rotted area is removed, for example, and the wall scraped down to white wood, thus reinfecting the tree, the rot will not spread.

Although pathogens may still be inside the tree, the compartmentalized pathogens are contained in that area that they initially invaded through a wound. This disease barrier zone

produced by a tree is produced by phenols which are found in all cells; in some manner, the phenols are converted to a poison which roots and pathogens cannot penetrate. Many times a wound will be compartmentalized in one growing season after the wounding, thus water and fertilizer play an important role in the recovery.

to invade more heart wood. No matter how quickly you work or how many times you immerse your "surgical" tools in alcohol, there will always be pathogens present that will attack the freshly cleaned wood, and until the tree can initiate cellular activity and form a new barrier zone, the pathogen would have gained one more "bite" from the tree. Also, not only are wound dressings ineffective, they frequently aggravate healing by providing a protective covering for pathogens.

Trunk wounds may be traced or scribed lightly with a very sharp instrument to a smooth or rounded outline; this may aid callus coverage and the scribed form can be any shape as long as points do not result. The elliptical outline sometimes recommended around cankers is unacceptable since there are points at the top and bottom of the ellipse. Round or oval would be better.

Biological Control for Trees - Arborists of the future may utilize biological control agents for treatment of wounds. It has been demonstrated that fresh tree wounds inoculated with fungi less hazardous than the normal dangerous fungi compartmentalize quicker, resulting in less damage to the tree. The reasoning being that the tree can compete (thus recover) more favorably against the weaker fungi, and weaker fungi tends to occupy all of the available niches for any fungi.

Pruning - Pruning should be started early in the life of the tree and continued when necessary throughout the life of the tree. For

most broadleaf trees, late dormant season pruning is best, not early spring when root activity has commenced. Never prune or scribe wounds when leaves are expanding; this requires the tree's energy in two different directions for callus and leaf tissue.

Pruning priorities, if only a limited amount of time can be devoted to a tree, require that dying branches be removed first, dead branches second and living branches third. Cut branches flush with the trunk; however, dead branches usually have a callus collar or bulge near the trunk and since the dead tissue has penetrated will into the collar where it has been compartmentalized, do not remove the collar flush with the trunk. This will allow an even greater amount of decay and necessitate the compartmentalization of more trunk area; the cut should be flush with the collar.

Seams and Frost Cracks and Shakes - Sudden temperature changes and droughts can cause cracks in tree trunks. During cold weather, the south and west facing sides of trees, particularly on southern exposed hills, may become warm, later when the sun drops quickly, the warm and cold sides of a tree may produce a contractive force which results in a longitudinal frost crack, but the crack may have produced a unnoticed seam. Later the seam serves as a weak spot for frost cracks to develop. Frost cracks can erupt violently at times, cracking in the wood as loud as a rifle shot. Frequently, frost cracks with large or bulging "lips" indicate a large amount of decay on the inside of the tree.

Frost shakes are not as well known as frost cracks. Shakes result when a cold tree is quickly warmed on the outside of the bark by the sun. This temperature change will result in the separation of the growth rings. This phenomenon may be heard occasionally as a muffled sound within the tree.