THE NEWSLETTER OF THE AMERICAN SOCIETY OF PLANT PHYSIOLOGISTS

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ASPPNEWS

1998 Annual Meeting: Online More Than Ever!

ASPP is once again using the Internet to aid in all stages of meeting planning and implementation for Plant Biology '98, scheduled to be held in Madison, Wisconsin, from June 27 through July 1. The ASPP Web page was used early on to advertise and disseminate information about the meeting. The "call for abstracts" was then published on the site, along with the electronic abstract submission form. Now attendees can register for the meeting and make their housing reservations directly through ASPP's Web page. And soon the online and searchable abstracts and meeting program will be available.

The electronic submission of abstracts was widely accepted and used. Of the approximately 850 abstracts received to date, only five were not submitted via the World Wide Web. This more streamlined method of submission has made the entire abstract process much smoother for both the attendees and the ASPP Program Committee. The abstracts will be made accessible through ASPP's Web page in April, and a more complete and cohesive abstract supplement and printed program will be delivered to attendees at the meeting.

One of the major highlights of Plant Biology '98 will be the joint symposia scheduled with the 9th International Conference on Arabidopsis Research. The ASPP Program Committee and the North American Arabidopsis Steering Committee (NAASC) have been working together to coordinate the details since March 1997. Several conference calls and face-to-face meetings, and much e-mail correspondence, have taken place to assure cohesive planning and a selection of topics that will be of interest to attendees of both meetings. The joint symposia, to be held on Saturday afternoon, June 27, and Sunday morning, June 28, will both be held at the Plant Biology '98 meeting site, the Monona Terrace Convention Center in Madison. Following Saturday's symposium, the attendees from both meetings will be invited to a reception at the rooftop garden of Monona Terrace. In addition, Plant Biology '98 attendees who arrive in Madison early are invited to attend the Arabidopsis conference sessions on Saturday morning, which will be held at the Memorial Union on the University of Wisconsin campus. Arabidopsis conference attendees may stay on for the Sunday afternoon minisymposia and poster sessions of the Plant Biology '98 meeting.

The format for Plant Biology '98 has been changed from that of recent years to allow for a more dynamic meeting featuring 22 minisymposia. These minisymposia were selected by the Program Committee from among the submitted abstracts and suggestions from the membership. In addition, the poster sessions will feature more than 800 posters, which will be on display for four full days. And, of course, our program will again be highlighted by the five major symposia (already publicized). The expanded minisymposia line-up is as follows:

Sunday, June 28, 2:00–4:00 p.m.
Identification of Gene Function in a Genomic Era
Light Responses: Blue and UV
Hormone Mode of Action

Sunday, June 28, 4:30–6:00 p.m.
Moving from Model Plants to Improved Crops
Lipid-Mediated Signaling
Flower Induction

Monday, June 29, 2:00–4:00 p.m.
Plastic Protein Targeting
Cytoskeletal Dynamics
Regulation of Nitrogen Partitioning

continued on page 3

INSIDE...

TABLE OF CONTENTS

Deadline for May/June 1998 *ASPP NEWS*: April 10, 1998

Future ASPP Annual Meetings

1998
Saturday, June 27, through Wednesday, July 1
Madison, Wisconsin
Meeting to overlap with the meeting of the 9th International Conference on Arabidopsis Research

1999
Saturday, July 24, through Wednesday, July 28
Baltimore, Maryland
ASPP's 75th anniversary meeting

ASPPNEWS

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Contact: Nancy A. Winchester, Editor, *ASPP NEWS*, 15501 Monona Drive, Rockville, MD 20855-2768 USA; e-mail nancyw@aspp.org; telephone 301-251-0560, ext. 17.

ASPP OFFICERS & STAFF

President
Ken Keegstra 517-353-2270
President-Elect
Brian A. Larkins 602-621-9958
Immediate Past President
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Elected Members
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Natasha V. Raikhel 517-353-3518
Joe Chappell 606-257-4624
Sectional Representatives
Midwestern
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Northeastern
Alison Roberts 401-874-4098
Southern
Marc A. Cohn 504-388-1464
Washington, DC
Jerry D. Cohen 301-504-5632
Western
Sharman O'Neill 916-752-2435

Headquarters Office
15501 Monona Drive
Rockville, MD 20855-2768 USA
Phone: 301-251-0560
Fax: 301-279-2996

Executive director, Kenneth M. Beam, ext. 15 ..... kenbeam@aspp.org
Director of finance and administration, Susan K. Chambers, ext. 11 ..... chambers@aspp.org
Accountant, Sondra A. Giancoli, ext. 10 ..... giancoli@aspp.org
Information specialist, Perry Masciana, ext. 46 ..... masciana@aspp.org
Member services coordinator, Kelley Noone, ext. 29 ..... knoone@aspp.org
Accounts receivable, Estella Coley, ext. 22 ..... estcoley@aspp.org
Administrative assistant, Zaneta (Janet) Bieglecka, ext. 63 ..... biegleck@aspp.org
Public affairs director, Brian M. Hyps, ext. 14 ..... bhyps@aspp.org
Foundation assistant, Janice Jordan, ext. 31 ..... jjordan@aspp.org
Publications director, Nancy A. Winchester, ext. 17 ..... nancyw@aspp.org
Publications assistant, Sylvia J. Braxton, ext. 33 ..... sbraxton@aspp.org
Managing editor, Plant Physiology, Deborah I. Weiner, ext. 18 ..... dweiner@aspp.org
Managing editor, THE PLANT CELL, Judith E. Grollman, ext. 19 ..... grollman@aspp.org
News and Reviews editor, THE PLANT CELL, Crispin B. Taylor, ext. 21 ..... ctaylor@aspp.org
Production editor, Plant Physiology, Lauren Ransome, ext. 30 ..... lransome@aspp.org
Production editor, Plant Physiology, Suzanne M. White, ext. 23 ..... suzanne@aspp.org
Production editor, THE PLANT CELL, Catherine A. Balogh, ext. 16 ..... balogh@aspp.org
Manuscript manager, Annette Kessler, ext. 20 ..... akessler@aspp.org
Manuscript assistant, Kimberly A. Davis, ext. 24 ..... kimdavis@aspp.org
Manuscript assistant, Aphrodite Knoop, ext. 25 ..... aknoop@aspp.org

continued from page 1

Monday, June 29, 4:30–6:00 p.m.
Protein Targeting
Light Responses: Phytochrome
Transcriptional Regulation

Tuesday, June 30, 2:00–4:00 p.m.
Carbon Partitioning
Ion Pumps and Transporters
Plant Insect Interactions

Tuesday, June 30, 4:30–6:00 p.m.
Emerging Model Systems in Plant Biology
Oxidative Stress
Rhizosphere Biology

Wednesday, July 1, 8:30–10:00 a.m.
Model Legumes
Protein Degradation

Wednesday, July 1, 10:30–12:00 noon
Starch Metabolism
Vegetative Cell Development and Differentiation

Plant Biology '98 will also feature workshops in several strategic areas. The Committee on Public Affairs will sponsor a workshop on Saturday, June 27, from 5:45 p.m. to 6:45 p.m. entitled "Perspectives of Science Leaders." A special "Careers Workshop" targeted to postdoctoral associates will take place on Monday, June 29, from 4:30 p.m. to 8:30 p.m. This workshop is being organized by the Committee on the Status of Women in Plant Physiology: Ruth Alscher, chair, Dean Della Penna, Sabine Heinhorst, Cynthia Henson, Elizabeth Hood, and Rob McClung. Only a limited number of slots are available in this workshop, so be sure to sign up early.

The Education Workshop will be held on Monday, June 29, from 7:30 p.m. to 10:00 p.m. The workshop is sponsored by the ASPP Education Committee, chaired by John Markwell. Jo Handelsman, professor of plant pathology, University of Wisconsin–Madison, will speak on "Engaging Students in Science through Active Learning." John Moore, professor of chemistry, University of Wisconsin–Madison, and editor of *The Journal of Chemical Education,* will present "Establishing New Traditions: Curriculum Development in Chemistry." Paul Williams, professor of plant pathology, University of Wisconsin–Madison, will speak on "Communicating across the Biology Education Community at the University of Wisconsin–Madison."

The ASPP Education Committee is also sponsoring two preconference workshops (see the registration package or the ASPP Web page for details):

Fast Plants and Bottle Biology Workshop: Friday, June 26, 1998

The Wisconsin Fast Plants (WFP) Program, with Paul Williams, will feature Fast Plants and Bottle Biology in an intensive, hands-on demonstration of investigative science teaching for those interested in training or working with in-service teachers. The focus will be on general life cycle concepts and activities using Fast Plants, appropriate at both the college level and for teacher in-servicing. Offerings will include germination activities developed for a recent NASA educational project, growth and development, pollen–stigma interaction, and embryogenesis. Les Hickok will participate with "Sex and the C-fern." There will be a limit of 24 participants. A continental breakfast will be served. Pre-registration is required. ASPP is funding the cost of the workshop and providing conference center lodging to participants Friday night, which includes parking and breakfast on Saturday.

Advanced Applications for Fast Plants Workshop: Saturday, June 27, 1998

This workshop will extend the Friday evening Wisconsin Fast Plants workshop to explore physiology (tropisms) and Mendelian and quantitative genetics. This workshop is for those who are familiar with Fast Plants or who have attended the Friday evening session. Participants are invited to present examples of how they are using Fast Plants in their teaching. There will be a continental breakfast. Pre-registration is required, with a limit of 24 participants.

The conference will also feature two luncheon programs. On Sunday, June 28, from 12:00 noon to 2:00 p.m., the Committee on Minority Affairs will sponsor a luncheon featuring Dr. Tim Conner. Dr. Conner's presentation is titled "Weeding through the GENOME: Functional Genomics in Arabidopsis." The Committee on the Status of Women will sponsor a luncheon on Monday, June 29, from 12:00 noon to 2:00 p.m. featuring Dr. Gerhard Sonnert. Dr. Sonnert will speak on "Women in Science and the 'Two-Body-Problem' of Dual-Career Couples." Space will be limited for both luncheons, so it would be wise to purchase your tickets with your meeting registration.

The ASPP Awards Symposium and Ceremony should not be missed! It will be held on Sunday, June 28, from 8:00 p.m. to 10:00 p.m. The ASPP "Charles Albert Shull Award" address, "Signal Transduction and Ion Channel Regulation in Guard Cells of Arabidopsis Mutants," will be given by Dr. Julian I. Schroeder.

Other functions not to be missed include the "Small Colleges/Primarily Undergraduate Institutions Breakfast," scheduled for Sunday morning, June 28; the "Plant Runners Stampede" 5k and 10k Fun Run, scheduled for Tuesday morning, June 29, in beautiful Madison; and the "Mid-America Dinner/Dance," scheduled for Tuesday evening, June 30.

Watch your mail for the Plant Biology '98 registration package. The package contains hotel/housing forms as well as registration forms and information. This information and other program details, including links to the Arabidopsis conference and to general Madison information, can also be found at http://aspp.org.

From all indications, Plant Biology '98 will be a very dynamic, focused meeting. Madison is a beautiful place to be in June, so make your hotel and air reservations as soon as possible.

The Program Committee would like to thank in advance all of the Plant Biology '98 attendees for their participation. We look forward to an intensive week of science and fun!

The Plant Biology '98 Program Committee and NAASC Representatives
ASPP: Roger Hangarter, Ken Keegstra, Brian Larkins, Don Ort, Mike Salvucci, Danny Schnell, Judy Verbeke, Mary Jo Vesper
NAASC: Rick Amasino, Daphne Preuss
ASPP Staff: Ken Beam, Susan Chambers

1998
Membership
Directory
Coming Soon!

See the online directory at
http://aspp.org/
member_services/
members.htm

Membership Has Its Privileges

Membership in the American Society of Plant Physiologists has grown steadily over the past few years to just over 5,100 members in January 1998. However, each year our gain of several hundred new members is matched by the loss of a similar number who leave. The Membership Committee, at its recent meeting in January, considered ways to improve member retention. Committee members felt it was important to remind members who were considering whether or not to renew about some of the benefits membership offers.

The most obvious advantages are the discounts available to members when registering for the annual meeting or when subscribing to the ASPP journals, *Plant Physiology* and THE PLANT CELL. Indeed, many of our international members indicated in our 1996 membership survey that the discounted member rates on the journals are a major reason for joining ASPP. And with the journals now online, access to the electronic versions will be another major benefit of membership. Although access to the online journals will be free to everyone during 1998, institutions will be required to pay for access in the future. However, the Executive Committee has tentatively decided to continue free access to the e-journals for all ASPP members into 1999 and beyond. Free access to the online versions of our journals will be one of the most important and valuable benefits of membership.

Although promoting communication via meetings and scientific journals is one of the most critical activities of our society, ASPP pursues other activities that promote plant biology and thereby benefit our members. One of the most important comes from the efforts of the Public Affairs Committee and Brian Hyps, ASPP's Public Affairs Director. The committee and Brian work continuously to educate both the general public and government officials about the importance of plant biology and the contributions made by research and education in the plant sciences. Although it is difficult to measure the impact of these activities, I am confident that I am correct when concluding that funding opportunities for public-sector plant biologists have been substantially enhanced by ASPP's public affairs efforts.

Further, ASPP provides ample opportunity for plant biologists with many different interests to interact and communicate with others of similar interests. For example, the ASPP Education Committee covers topics of interest to educators in every issue of the *ASPP NEWS* as well as on the ASPP Web site. And the ASPP membership directory, published both in a print version and on the Web, allows members to locate each other easily and conveniently.

There are many other benefits of membership in ASPP that could be cited, and each of you probably has slightly different reasons for renewing yours.

Both the Membership Committee and the Executive Committee are pursuing additional ways to provide value to our members. If you have ideas that you think should be considered, please contact me or one of the members of these committees. We value both your ideas and your membership and need your continued support.

Ken Keegstra
ASPP President, 1997–1998
Michigan State University
keegstra@pilot.msu.edu

Membership Benefits: A Postdoc's Perspective

What can ASPP do for its postdoctoral and graduate student members? This may seem a silly topic: If you're reading this in the *ASPP NEWS*, you're probably already a member, and you likely have a good idea why you joined.

But maybe you don't. I'm sure that more than a few of us joined because of the ASPP annual meeting: The cost of a yearly membership is exactly the difference between the member and nonmember registration fee. Or maybe you joined because your adviser told you it was a good idea. Perhaps you just had $30 ($50 for postdocs) burning a hole in your pocket and thought that ASPP was a good place to spend it. Regardless, now is probably a good time to remind you just what it is that your membership gives you each year, or, if you're not already a member, what the benefits of joining ASPP are.

Again, the difference in the cost of registration for the annual meeting between members and nonmembers is the cost of this year's membership. If you're signing up for the annual meeting as a nonmember, why not just check the box to join for the year? While you're there, why not also spend a couple of bucks to join the regional section for your area ($1–$5 depending on the section)? The sections give you the opportunity to take part in the regional ASPP meetings. These meetings are more local, much smaller, and much less expensive to attend than the annual meeting. Young researchers looking for an opportunity to present their work, but who aren't quite ready to handle an auditorium full of spectators, should particularly take advantage of the regional meetings.

ASPP membership also gives you a voice in Washington, DC. This may not be important to you yet. Maybe you don't think your voice is important enough, or maybe your voice hasn't decided what it wants to say. But let's face it, someone is paying your salary, and chances are that the government (NIH, NSF, USDA, DOE, etc.) is somehow involved. Even beyond that, some day many of us will be competing for those precious funds, and it would certainly be nice to know that money will be available when the time comes. An essential part of ASPP's efforts is to make sure that plant research continues to get its share of government funding. A recent example was ASPP's efforts to ensure that the increase in NSF spending for plant genome research did not come at the expense of nongenome plant research, which resulted in a net increase in funding for both types of plant research.

ASPP also publishes THE PLANT CELL and *Plant Physiology*. As members, we are entitled to substantial discounts for subscriptions to these top-ranked plant journals (which are even lower for students and postdoctoral members). If your lab doesn't already get these journals, or if you would like your own copies, the member

discounts bring these publications within reach, even on a student's salary.

Probably the biggest reason to be part of ASPP can be found just a few pages back in this newsletter. A substantial number of positions available for postdoctoral, faculty, and industrial jobs are listed in each issue of the *ASPP NEWS*. There is also the opportunity to join the ASPP Job Placement Service. Eventually, we will all need a job. This weekly updated listing of available jobs and fellowships from around the country and the world is a great place to start looking. You can also view the latest jobs even sooner by visiting the ASPP Web site (http://aspp.org/jobs/jobs.htm), where the postings are updated every Friday. If you're looking for a job in industry, you may be especially happy to hear that ASPP also arranges a job placement service at the annual meeting each year. How can you take advantage of this opportunity? Check the ASPP Web site (http://aspp.org) or your Plant Biology '98 registration package for more information.

I hope this article is a helpful reminder of why you should join ASPP. I can't possibly have listed all the benefits of being a member of ASPP—there are too many. The Membership Committee is always looking for new ways to help our members, and the best way for the committee to do that is to hear from you, our current and future members. Please, take a moment to let me know of any really good things that ASPP has done for you as a student or postdoc (bad things, too—it will help us improve!). Also let me know if there is something else you would like to get from ASPP as part of your membership. You can reach me by e-mail at sanderfo@pilot.msu.edu, or write to me at the address listed in the ASPP membership directory—another great benefit available in print and online: MSU-DOE Plant Research, Plant Biology Labs, East Lansing, MI 48824-1312.

Tony Sanderfoot
Postdoctoral Representative to the
Membership Committee
Michigan State University, East Lansing
sanderfo@pilot.msu.edu

International Workshop in Countries with Emerging Research Programs: A Call for Proposals

We are soliciting proposals for a workshop to be held in 1999 in a country with emerging research programs. The goals of the workshop are to increase interaction with plant scientists in other countries and to initiate collaborations for future scientific exchange.

Proposals should be no longer than three pages and should include the following:

1. *Workshop title, location, and projected dates.*
2. *Anticipated goals and outcomes:* A paragraph or two justifying the topic of the workshop and the anticipated impact the workshop will have on teaching and research in the host country, as well as on future scientific exchanges with the host country.
3. *Names and qualifications of the organizers:* If applicable, indicate previous collaborations or interactions of the organizers and the familiarity of the ASPP organizer with the host country. Attach a two-page vitae for each organizer.
4. *Workshop format:* Outline the general format with regard to lectures and laboratories. How many participants could be accommodated for each?
5. *Potential ASPP participants:* Provide a provisional list of 10 ASPP members you would like to invite to participate in the workshop. Keep in mind that the participants will be expected to make a major commitment of time and that both teaching and research experience are essential.
6. *Participants from the host country:* How will participants, both teachers and students, be selected? What efforts will be made to include participants from other regions of the host country or neighboring countries? How will the workshop be advertised?
7. *Host facilities:* Describe the teaching and research facilities available for the workshop. (Is there adequate equipment, space, and electricity to do the lab exercises proposed? Are there housing facilities and lecture halls to accommodate the number of participants anticipated?)
8. *Organizational calendar:* Give a projected timetable for organizing the workshop. Include projected dates for reports to ASPP membership during the planning and upon completion of the workshop.
9. *Proposed budget:* In 1998, ASPP allocated $32,000 for travel and supplies for the ASPP participants in support of the workshop to be held in Argentina. Future proposals should indicate similar anticipated costs for travel and supplies for ASPP participants. Also indicate the anticipated contribution of the host country and additional funding sources (for example, include potential sources of funding for travel for students from the host country or neighboring countries and of funding for food and lodging for the ASPP participants).

We encourage all ASPP members, especially those who have had experience organizing workshops and who are familiar with the host country language and culture, to work with colleagues in the host country to develop a proposal. The proposals will be reviewed by an ad hoc workshop committee consisting of Wendy Boss, Jerry Cohen, and Hector Flores. Please contact one of the members of the ad hoc workshop committee if you have questions about the proposal or proposal format. The proposals should be sent to Ken Beam (kenbeam@aspp.org), ASPP, 15501 Monona Drive, Rockville, MD 20855-2768. E-mail submissions are encouraged. Deadline for receiving the proposals is Friday, June 12th, 1998.

This summer, ASPP will be cosponsoring a workshop in Argentina with Universidad Nacional de Río Cuarto, Comité Argentino–Brasileño de Biotecnología, Consejo Nacional de Investigaciones Científicas y Técnicas, Consejo de Investigaciones Científicas y Tecnológicas de La Provincia de Córdoba, and Sociedad Argentina de Fisiología Vegetal. The workshop, entitled "Frontiers in Biology," is being held in Rio Cuarto, Argentina, July 27–August 7, 1998. It will involve two weeks of lecture and laboratories taught by both U.S. and Argentinean participants. Hector Flores, of Pennsylvania State University, and Rubén Bottini, of Universidad Nacional de Río Cuarto, are the coordinators.

These workshops provide an excellent opportunity to make a contribution to plant science on a global scale. We hope that many of you will take the initiative to submit a proposal.

Washington, DC, Section

The 1998 Washington Section ASPP Winter Dinner banquet was held on Friday evening, February 20, at the Best Western Maryland Inn in College Park. In keeping with tradition, our current ASPP president, in town for the winter ASPP Executive Committee meeting, presented a seminar before dinner. Ken Keegstra's talk, entitled "A Time for Protein Import: The Tics and Tocs of the Chloroplast Envelope," was a masterfully delivered presentation of past and recent research findings, which built from basic understandings of chloroplast protein import to detailed studies of individual protein components in the envelope import complexes. As a result of the broad scope of the talk, the many student members in attendance were presented lessons in plant biochemistry, protein import, and molecular genetics. The talk received high marks from the student contingencies from Howard University (Bill Gordon's undergraduate plant physiology class) and George Washington University (Rob Donaldson's international graduate student assemblage). Just prior to Ken's talk, ASPP Executive Director Ken Beam started a lively discussion with an update on the ASPP Publications Committee plans for future electronic publications, and ASPP Public Affairs Director Brian Hyps provided the latest scoops from Capitol Hill, with emphasis on funding matters that impact plant science. ASPP Executive Committee Sectional Representative Jerry Cohen reported to the membership on recent ASPP Executive Committee decisions, emphasizing ASPP "Good Works" initiatives in the United States and developing nations. The membership was pleased to see a few longer distance members from out of the area in attendance, including Ruth Alscher (VPI), Chair-Elect Hector Flores (Penn State), and Brett Savary and Arland Hotchkiss (USDA–ARS, Philadelphia). Once again, the Maryland Inn food and drink were top-notch, and the meeting adjourned very slowly, with members lingering well after the plates were cleared. The membership now looks forward to the spring meeting, planned for April 16–17, at Goucher College in Baltimore.

Respectfully submitted,
Douglas G. Luster
Secretary–Treasurer, WAS–ASPP

New Staff at ASPP Headquarters

ASPP Headquarters Office is pleased to welcome Kelley Noone as the new membership coordinator. Kelley fills the vacancy left by Sharon Kelly's departure in early March. She brings to the job six years of experience in development, fund-raising, and membership.

Before coming to ASPP, Kelley was manager of information services in the Office of Development at St. Joseph's University in Philadelphia, where she supervised the maintenance of the alumni/development database, prepared user documentation of the entire database system, and served as information systems liaison in the office.

Kelley has a bachelor's degree in political science from the University of Maryland, College Park, and is currently working on her master's degree in general administration at the university.

Kelley Noone, ASPP member services coordinator.

ASPP JOURNALS NOW ONLINE!

The American Society of Plant Physiologists (ASPP) is pleased to announce that the society's journals—**THE PLANT CELL** and ***Plant Physiology***—are now available online at

http://www.plantcell.org
http://www.plantphysiol.org

The online journals contain the full content of each issue, including all figures and tables. The full text is searchable by keyword, and the cited references include hyperlinks to Medline and to the online full text of many other frequently cited journals. Online full-text content begins with the January 1998 issues and will expand with each month's new issues. The full-text articles on the sites are available to all free of charge through December 1998.

We very much encourage you, on your first visit to the sites, to sign our "guestbook." This will take only a minute or two, and will give us helpful information about who our online readers are and how they are connecting to us. In addition, we would appreciate comments, critiques, questions, or suggestions from you; these can be sent via the Feedback button found throughout the sites. Feedback will help us decide what new features would be most valuable for the sites and how well the sites are working for you.

Plant Physiology and **THE PLANT CELL** online are being produced in conjunction with Stanford University's HighWire Press, which also works with the following medical/research journals frequently cited in **THE PLANT CELL** and ***Plant Physiology***: *EMBO Journal*, *Science*, *Journal of Biological Chemistry*, and *Proceedings of the National Academy of Sciences*, among others.

We hope you find the sites useful, and we look forward to hearing from you.

Dear Colleagues:

I congratulate Maarten Chrispeels for calling the attention of ASPP members to the possibility of helping our Vietnamese colleagues strengthen plant biology in their impoverished country ("Plant Biology in Vietnam," *ASPP NEWS*, vol. 24, no. 6, November/December 1997, p. 16). Such an effort would not only benefit science in general, but would, at long last, involve American plant physiologists in reversing damage caused in part by activities of their profession. As Chrispeels reminds us, "Contamination of soils with dioxin and other chemicals is a very serious problem in Vietnam. . . ." It is probable that most of the dioxin results from the spraying of more than 100 million pounds of Agent Orange to defoliate the Vietnamese countryside during American military operations. The effective components of Agent Orange were 2,4-D and 2,4,5-T, substances developed through the efforts of plant physiologists and biochemists.

Having myself made five earlier trips to Vietnam on precisely this sort of mission, perhaps I may be permitted to describe some of the history surrounding the involvement of ASPP members in scientific aid to Vietnam. Late in 1965, the *New York Times* carried an account of "Operation Ranch Hand," the Army's program involving aerial application of defoliants to remove dense leafy cover over the Ho Chi Minh trail to permit increased aerial interdiction of the movement of personnel and materiel. This raised several questions: Had the herbicides been toxicologically tested for effects on humans and animals? Were the long-range ecological effects of such an operation understood? Did this operation in any way violate the Geneva Protocol regulating the use of chemical toxicants in war?

At the ASPP business meeting in 1966, I read a draft of a letter to President Lyndon Johnson raising these questions. Thirteen members signed the letter, which was duly sent off to Washington. Some weeks later, I received a reply from Dixon Donnelley, an undersecretary of state, reassuring me that competent scientific experts had advised the administration that the chemicals used in Vietnam were harmful only to plants and that no international rules were being violated. When our group pressed for the data upon which these conclusions were based, we found the data to be either flawed or, in the case of human toxicology, entirely lacking. We thus formed a committee to continue applying pressure to clarify these matters.

A short while later, the American Association for the Advancement of Science, responding to a similar petition, established an Herbicide Assessment Commission, chaired by Matthew Meselson of Harvard University and including on the staff one of my former graduate students, Arthur Westing. On the basis of this commission's findings, the Department of Defense commissioned a survey of the relevant literature, created an investigatory committee under our late colleague Anton Lang, and authorized several toxicological tests performed by the Bionetics Research Laboratories. It was these latter tests, reported to the surgeon general, that revealed the teratogenicity in rodents of some of the phenoxyacetic acid herbicides, especially 2,4,5-T. This toxicity was later traced to dioxin contaminants formed as undesirable by-products of the synthetic reaction coupling chlorinated phenols to the acetic acid side chain. The teratogenic effects of chlorinated dioxins, revealed by our group to Presidential Science Adviser Lee Dubridge at a memorable meeting in the Old Executive Office Building late in 1969, led President Nixon to order a halt to the use of Agent Orange early in 1970. Plant physiology had triumphed over politics!

I visited Vietnam in 1971 and four additional times under the aegis of several groups of interested American scientists, including the Scientists' Institute for Public Information, the Society for Social Responsibility in Science, and the Federation of American Scientists. A group of us later formed the Committee for Scientific Aid to Vietnam, which sent personnel to Vietnam with donated books, glassware, and chemicals and set up laboratories to train plant physiologists and tissue culturists in Hanoi and Ho Chi Minh City. This committee is still functioning, with headquarters located in the medical school of the University of Wisconsin, and remains active with facilitating interchange of scientific personnel. My account of this entire adventure can be found in "The Social Responsibility of Scientists," published in the *Annals of the New York Academy of Sciences*, volume 196, article 4, pages 223–235, 1972. Arthur Westing went on to visit Vietnam many times and to edit several relevant volumes, including *Herbicides in War*, published by the Stockholm International Peace Research Institute through Taylor & Francis, 1984. (Ethan Signer and I, who traveled to Vietnam in 1971, were then invited to the Peoples' Republic of China (PRC), where we became the first American scientists to visit China since 1949, being greeted at the Great Hall of the People in Beijing by no less than Premier Chou En-lai. A heady experience for a plant physiologist! I was subsequently able to arrange the first exchange of botanical delegations between the United States and the PRC.)

These days, when official diplomatic relations exist between the United States and Vietnam, it is now much easier to arrange to help our scientific colleagues there. We should certainly do so, for the sake of science, international amity, and general humanitarian concerns.

Arthur W. Galston
Eaton Professor of Botany, Emeritus
Yale University
(ASPP President 1962–1963)

"The 12 Principles"

I hadn't bothered to check your stated principles (*ASPP NEWS*, vol. 25, no. 1, January/February 1998, p. 5) before I came across Harry Beevers comments. They have absolutely hit the nail on the head, and I suggest that the "Principles" be immediately modified as he recommends.

Peter J. Davies
Cornell University
Ithaca, New York

Harry Beevers' comments on ASPP's proposed 12 Principles of Plant Biology are well-taken. I believe they should be adopted.

Donald B. Fisher
Washington State University
Pullman

ASPP NEWS welcomes comments on topics covered in the newsletter and on other points of interest to the profession. Letters are published as space permits and may be edited for clarity and length. Submissions may not necessarily be published; receipt is not acknowledged. Mail letters to Editor, ASPP NEWS, 15501 Monona Drive, Rockville, MD 20855-2768 USA; e-mail: nancyw@aspp.org.

NSF Requests $40 Million for Plant Genome Research in FY99 Budget

President Clinton's budget proposal for the National Science Foundation (NSF) for fiscal year 1999 includes $40 million for plant genome research. This is an important development at this early stage in the FY99 budget process and increases the prospect that there will be full-scale continuation of the plant genome initiative next year. The plant genome initiative began with the FY98 budget, when Congress enacted a provision containing $40 million for plant genome research sponsored by Senator Christopher Bond (R-MO). Senator Bond continues to support plant genome research.

The administration's FY99 request for funding for research and related activities in the NSF Biological Sciences Directorate (which includes basic plant research) is $417.82 million, which is a proposed increase of $47 million, or 12.7 percent more than the FY98 budget.

The total FY99 budget request for NSF research and related activities is $2.85 billion, which is an increase of $301 million, or 11.8 percent, over FY98.

The FY99 request for education and human resources is $683 million, an increase of 8 percent.

The overall administration request for NSF is $3.8 billion, which represents an impressive 10 percent increase over FY98.

Additional $19 Million Sought by USDA for Food Genome Research; Increases Sought in FY99 Budget for NRI and ARS

The U.S. Department of Agriculture is requesting $40 million for food genome research in fiscal year 1999, which represents an increase of $19 million over the estimated $21 million in the FY98 budget. The food genome request would include plant, animal, and microbial genome research. A total of $6 million would be added to the current $10 million for genome research supported by the National Research Initiative (NRI), and an additional $10 million in a new, competitive Food Genome Research Program is proposed in separate legislation. The Agricultural Research Service (ARS) genome research program would increase by $3 million to a total of $14 million. Food genome research is a priority in the FY99 USDA budget. ASPP has been active in efforts with the department supporting plant genome research.

In President Clinton's FY99 budget proposal, the request for the USDA National Research Initiative Competitive Grants Program is $130 million, which is $32.8 million, or 33 percent, more than NRI received in FY98. In past years, bills eventually enacted have fallen short of the requested NRI increase.

USDA is requesting nearly $777 million for ARS for FY99, which represents an increase of $32 million, or about 4 percent. The ARS buildings request is nearly $36 million.

Some $60 million in new programs is proposed for ARS this year in plant, animal, nutrition, genomic, climate change, and other areas, with an actual proposed increase of $32 million. Spending in some existing areas would need to be reduced to provide remaining funds for the new programs.

Increase of 18.5 Percent Sought for DOE Division of Energy Biosciences; $5 Million Sought for Carbon Management

The Department of Energy (DOE) is requesting $32.5 million for the Division of Energy Biosciences for fiscal year 1999. This represents an increase of $5 million, or 18.5 percent, over FY98, that would be used primarily for basic plant and microbial research for carbon management as part of the new Climate Change Technology Initiative.

Greg Dilworth, director of the Division of Energy Biosciences, has been working for many months explaining to colleagues within DOE the opportunities that basic plant research offers for managing carbon dioxide in the atmosphere. Office of Energy Research Director Martha Krebs worked with Dilworth and other program directors who were developing this new initiative. Krebs spoke on this subject at the ASPP annual meeting in Vancouver in summer 1997. The Climate Change Technology Initiative also includes support for materials science ($3.5 million), chemical science ($4.5 million), and geosciences ($3 million).

Inclusion of basic plant research in the study of management of carbon dioxide in the atmosphere is an important recognition of the contributions basic plant research can make in this area.

Support of ASPP Campus Contacts will be needed for this initiative and the Division of Energy Biosciences proposal in future months as the budget is considered in Congress.

Make your hotel reservations and register NOW for

Plant Biology '98

See the registration and housing forms on our World Wide Web site

http://aspp.org

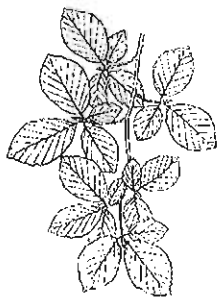
Interagency Report Recommends Increased Commitment to Plant Genome Research

The White House–appointed Interagency Working Group on Plant Genomes (IWG) of the National Science and Technology Council recommended in its January 1998 report an increased commitment to plant genome research. The IWG report noted that the solutions to many of our nation's greatest challenges can be met through the application of plant-based technologies. It further noted that plant genome research will contribute to—

- revitalization of rural America through its role in improving agricultural production
- reduction of greenhouse gases from the more efficient production of plant biofuels
- rehabilitation of chemically contaminated sites using selected plants
- reduction of malnutrition worldwide through the development of higher yielding and more nutritious crops that can be grown on marginal soil.

IWG recommends federal support of at least $320 million in a targeted manner to leverage existing plant genome activities in the public and private sectors to accomplish the five-year goals of the National Plant Genome Initiative. The National Science Foundation (NSF) received $40 million in support of plant genome research in the FY98 spending bill sponsored by Senator Christopher Bond (R-MO). President Clinton is requesting $40 million for NSF for the Plant Genome Initiative in the FY99 budget. The Department of Agriculture is requesting an additional $19 million for food genome (plant, animal, and microbial) research. Plant genome research is being coordinated by NSF, USDA, and the Department of Energy.

ASPP is seeking support for the administration's FY99 proposals for plant genome research and for the Initiative for Future Agriculture and Food Systems (S. 1150) to help support needed plant genome research.



Reauthorization of Agricultural Research Programs Sent to Conference

A House/Senate conference that could reauthorize the National Research Initiative Competitive Grants Program (NRICGP) and also establish a new five-year, $780 million competitive grants program for agricultural research (called the Initiative for Future Agriculture and Food Systems) convened early in March.

The House and Senate appointed conferees to resolve differences in the House and Senate versions of legislation to reauthorize the Agricultural Research Title. The Senate bill is S. 1150, and the House bill is H.R. 2534. Both bills include provisions to reauthorize the NRICGP. Therefore, it appeared that there was an excellent prospect that the provision for reauthorization of the NRICGP would emerge from the conference. S. 1150 contains the Initiative for Future Agriculture and Food Systems, but there is no similar provision in the House bill. It is possible that the eventual conference agreement could include (1) the Senate version of the Initiative for Future Agriculture and Food Systems; (2) no provision for this proposed competitive grants program; or (3) some modification of the Senate proposal for the Initiative for Future Agriculture and Food Systems.

ASPP Campus Contacts responded quickly to urge members of Congress to contact conferees to recommend that conferees agree to the reauthorization of the NRICGP and to the inclusion of the Senate provision for the Initiative for Future Agriculture and Food Systems in the House/Senate conference agreement.

The Initiative for Future Agriculture and Food Systems would be funded in part from administrative savings in the Food Stamp program. Members of Congress have reported that some states have been double-billing the Food Stamp program for additional funds. ASPP has pointed out to members of Congress that participants in nutrition programs and all consumers would benefit from the lower food prices that could result from additional support for agricultural research.

Federal nutrition programs such as Food Stamps and Women, Infants, and Children (WIC) would cost far more if it were not for the exceptionally low cost of food in the United States as a result of agricultural research. For example, just 11 percent of the disposable personal incomes of U.S. consumers goes to the purchase of food, compared with more than 15 percent in France; 17 percent in Germany, Italy, and Japan; 33 percent in Mexico; and 50 percent in India. Additional investment by Congress in agricultural research could further lower the costs of food for nutrition program participants and for all Americans.

When the conference agreement is reached, it will be sent back to the House and Senate for final approval. Although some members of the House see the funding provisions for the Initiative for Future Agriculture and Food Systems as controversial, there is a reasonable prospect that there could be enough votes to pass the eventual conference report in both the House and Senate, whether or not the initiative is included in the agreement.

Remember!

Job listings on ASPP's Web site are updated every Friday, so be sure to check in frequently. Some jobs listed online are not listed in the newsletter.

http://aspp.org/JOBS/

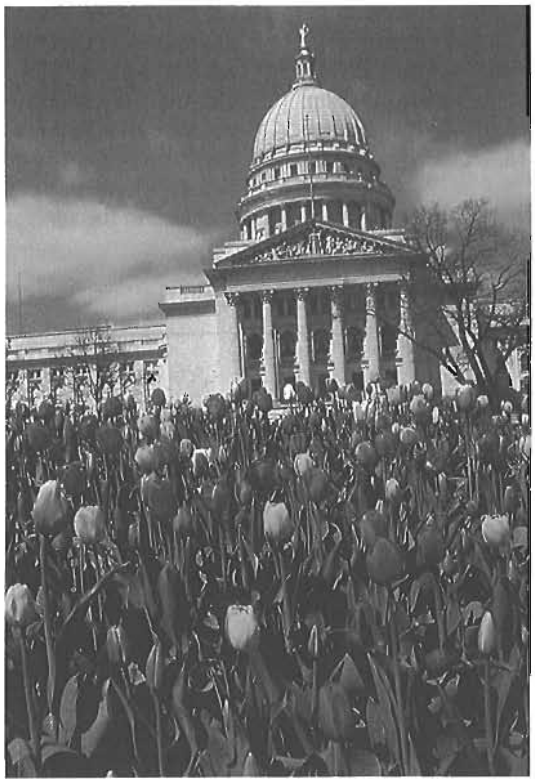
ASPP Public Affairs Program Recognized by ASAE for Federal Legislative Campaign

ASPP been named a "certificate winner" by a panel of its peers in the Awards of Excellence Competition held by the Government Relations Section of the American Society of Association Executives (ASAE). *Certificate winner* represents second-place winner for the category, which was Single-Issue, Federal Legislative. ASPP Public Affairs Director Brian Hyps received results of the competition in a February 28 letter from the ASAE Government Relations Section Awards of Excellence Committee.

The society's submission described the federal legislative campaign that ASPP members mounted last year to enact a plant genome research initiative supported with $40 million in new funds from the National Science Foundation. Members of the ASPP Committee on Public Affairs, the Executive Committee, and ASPP Campus Contacts were active in making this campaign successful.

ASPP will receive special recognition at ASAE's 17th Annual Legislative Summit, which will be held in June in Washington, DC, and in the Government Relations Section's newsletter *Government Relations*. ASPP will also receive special mention in an ASAE press release about the awards competition and in the awards announcement flyer at the Legislative Summit. ASAE is made up of 20,300 individual association professionals from more than 11,000 associations.

Members of the Committee on Public Affairs are Lou Sherman, chair, Bob Buchanan, Jim Cook, Elisabeth Gantt, Rob Horsch, Peggy Lemaux, Dawn Luthe, Don Ort, Ralph Quatrano, and Jim Siedow. Two former members—Mary Helen Goldsmith and Ken Keegstra—also served during the course of the campaign, and Don Ort was ASPP president at the time. Doug Randall, professor at the University of Missouri, chair of the ASPP Board of Trustees, and charter member of the ASPP Committee on Public Affairs, played a key role in the legislative campaign with his colleagues at the University of Missouri in seeking enactment of plant genome legislation sponsored by Senator Christopher Bond (R-MO).



Madison, Wisconsin, State Capitol. Madison is the site of the ASPP 1998 Annual Meeting, June 27–July 1. Photo courtesy of the Greater Madison CVB.

Your ballot to elect ASPP officers for 1998–1999 is coming your way in April. Watch the mail and remember to vote! Ballots must be received at ASPP headquarters by May 22 to be counted.

ASPP Education Forum

Edited by Bob Wise, Department of Biology, University of Wisconsin–Oshkosh, Oshkosh, WI 54901
e-mail: wise@uwosh.edu

Plant Ecophysiology

Edited by M.N.V. Prasad. John Wiley & Sons, Inc., New York, 1997, 542pp. Comments by William E. Winner, Department of Botany and Plant Pathology, Oregon State University, Corvallis, OR 97331

Plant Ecophysiology is a book about plant responses to environmental factors. The editor, M.N.V. Prasad, has pulled together 15 chapters from 29 contributors. The central purpose of the book is to provide a state-of-the-art report on the broad field of plant ecophysiology, including plant stress physiology and adaptations of plants to environmental stress. The audiences for the volume include those individuals in agriculture, silviculture, and horticulture and others concerned with maximizing plant productivity. Students will also find the book useful, as the chapters are summaries of specific topics typically found in many plant science courses.

The book is divided into two sections. The first eight chapters focus on basic mechanisms of plant responses to natural and abiotic factors including light, UV-B radiation, chilling and freezing, high temperature, drought, flooding, salt, and trace metals. The remaining seven chapters discuss the effects of anthropogenic and abiotic factors on plants and include allelochemicals, herbicides, polyamines, air pollutants, carbon dioxide, radionuclides, and fire. Although the book is well over 500 pages long, it is not intended to be comprehensive. Examples of topics omitted include much about roots, nutrients, and below-ground plant processes. Little is presented on mycorrhyzae and rhizosphere biology. Finally, there is no chapter or commentary on climate change.

The collection of chapters is not designed to provide an integrated view of plant–environment interactions. On the contrary, one strength of the book is the interesting group of authors assembled by the editor and the way each chapter stands alone. Many of the authors are from universities in India, with others from the United States, Canada, Germany, Portugal, Japan, the Netherlands, and Poland. The wide array of topics addressed by authors from a diversity of nationalities provides readers with an opportunity to learn unique perspectives and to find references to important, interesting work that may be out of the mainstream of North American literature.

The diversity of authors results in chapters that differ in writing style, level of writing, and approaches to the topic. For example, the chapter on high temperature focuses on the cellular and molecular biology of heat-shock proteins. The chapter on light discusses the physics of light, measurement of light, light distribution in canopies, light absorption by leaves, and use of light within leaves. The chapter on drought covers locations of global deserts, the nature of schlerophyllous leaves in Mediterranean climates, and short descriptions of the effects of drought on stomata, photosynthesis, and root:shoot distribution.

Prasad and his contributors have worked hard to make this a polished, well-edited book with text, figures, and tables that are easy to read and that provide clear examples of important ideas. The references are found at the end of each chapter.

Plant physiologists will want to evaluate the book for their own purposes. Some aspects will be of interest to those teaching undergraduate and graduate courses in plant physiology. Those engaged in research on specific topics of plant–environment relations will want to see relevant chapters for unique perspectives and references.

Plant Physiology Laboratory Manuals Sought for Education Booth at ASPP Annual Meeting

One of the more popular displays at last year's Education Booth at the Society's annual meeting in Vancouver was a selection of books and manuals for teaching plant physiology labs and lectures. Approximately 40 titles were available for inspection. A similar display is being put together for the Education Booth at this year's meeting. Anyone who has developed a manual or compilation of exercises is asked to send one display copy to Bob Wise at the above address (a syllabus would be helpful as well). Please clearly indicate the instructor and home institution, and provide the name and address of a contact person should booth attendees have further questions. The materials will be on display at the Education Booth throughout the meeting.

"Fun" Books for Teaching Plant Biology

A recent question by Mark Hammer (Wayne State College) directed to the Plant Ed newsgroup generated some good suggestions for popular books for use in teaching plant biology. Thanks go to Katherine Schmid (Butler University), Michaele Lee Huygen (Naval Postgraduate School), Susan Singer (Carleton College), and (especially) Scott Meissner (McKendree College) for their suggestions and comments.

The Action Plant: Movement and Nervous Behaviour in Plants, by P. Simons (Blackwell, hardcover, ISBN: 0-631-13899-4). A few of the chapter and section titles give the flavor of this book: "The Sensitive World of Nervous Plants," "Exploding Plants," "Flower Power," "Hunting and Killing," and more. This book has an excellent set of citations from the research literature, as well as great appendixes that describe experiments, list sources of seeds for touch-sensitive plants, and give information on how to grow them. A great resource for student projects. (Unfortunately, out of print and hard to find)

The Diversity of Life, by E. O. Wilson (Belknap Press, softcover, ISBN: 0-674-21298-3).

Economic Botany: Plants in Our World, by B. B. Simpson and M. C. Ogorzally (McGraw-Hill, hardcover, ISBN: 0-07-057443-X). This is a textbook, but it has such a wonderful history of the uses of plants that it makes a great source of stories to seed into lectures.

Fantastic Trees, by E. A. Menninger (Timber Press, hardcover, ISBN: 0-88192-324-9). A bit dated, but still fun. Has many stories about weird trees.

A Feeling for the Organism: The Life and Work of Barbara McClintock, by E. Fox Keller (W. H. Freeman & Co., softcover, ISBN: 071671504X).

A Natural History of Trees of Eastern and Central North America, by D. C. Peattie (Houghton-Mifflin, softcover, ISBN: 0-395-58174-5). A fun set of essays on uses and characteristics of trees. There is another volume for western trees.

Private Life of Plants: Birds & the Bees, by D. Attenborough (Theatre Communications Group, VHS videotape, ISBN: 6304030908).

Private Life of Plants: The Natural History of Plant Behavior, by D. Attenborough (Princeton University Press, hardcover, ISBN: 0-691-00639-3). The companion book to the videos, which can be used in class for background. The book also can serve this purpose.

continued on page 12

continued from page 11

Reaching for the Sun: How Plants Work, by J. King (Cambridge University Press, softcover, ISBN: 0521587387). The essays do not require much background and have eye-catching titles such as "Plants Are Cool, but Why?"
Tales of a Shaman's Apprentice, by M. J. Plotkin (Viking Press, softcover, ISBN: 0-670-83137-9). A very readable account of what ethnobotany is all about.
This Green World (Edwin Way Teale Library of Nature Classics), by R. Platt (Dodd Mead, hardcover, ISBN: 039609189X). (May be hard to find)
What Is Life? by L. Margulis and D. Sagan (Simon & Schuster, hardcover, ISBN: 0-684-81326-2). Very well illustrated. A fun overview of life.

Wisconsin Fast Plants Program and ASPP Coordinate Educational Activities

The Wisconsin Fast Plants Program (WFP) will be partnering with ASPP for two upcoming events. At the National Association of Science Teachers national convention in Las Vegas, April 16–19, 1998, WFP will plan and staff the ASPP Education Booth, featuring the Central Principles of Plant Biology (ASPP), Wisconsin Fast Plants and Bottle Biology (Paul Williams, University of Wisconsin), C-ferns (Les Hickok, University of Tennessee), and the Plant Cube and Sock Heads (Dina Mandoli, University of Washington). WFP will also be the subject of two workshops at the ASPP annual meeting in Madison this July (see related story, below). This is the first time that ASPP and WFP have fully coordinated their educational activities in front of national audiences.

Two Wisconsin Fast Plants Workshops Scheduled for Madison Meetings

Paul Williams and the Wisconsin Fast Plants Program (WFP) will offer two WFP workshops the Friday and Saturday before the beginning of the ASPP annual meeting. The first workshop will run all day Friday, June 26 (8:30 a.m. – 8:30 p.m., with meal breaks), and will focus on general life cycle concepts and activities using Fast Plants, appropriate at the college level and for teacher in-servicing. Offerings will include germination activities developed for a recent NASA educational project, growth and development, pollen–stigma interactions, and embryogenesis. Les Hickok (University of Tennessee) will participate with "Sex and the C-fern." There will be a limit of 24 participants; a continental breakfast is included. A second workshop will be held Saturday morning. It will extend the Friday workshop to explore physiology (tropisms) and Mendelian and quantitative genetics. The workshop is for those who are familiar with Fast Plants or who have attended the Friday session. Participants will be invited to present examples of how they are using WFP in their teaching. Participation is again limited to 24, and a continental breakfast is included. Registration information will be in the Plant Biology '98 registration package. Further information can be received from WFP at (608) 263-2634 or http://www.wfp@fastplants.cals.wisc.edu.

ASPP Education Foundation Exhibit at Epcot

March 13–April 4, 1998
April 17–May 31, 1998

Genetically improved Bt potatoes from Monsanto, Bt corn from Novartis and Pioneer Hi-Bred International, and green beans demonstrating increased calcium content will be among many plants growing at the ASPP Education Foundation exhibit, "Plants for the 21st Century," at Walt Disney World's Epcot Center, March 13–April 4. During this time, the exhibit will be prominently located near the entrance to the park. It will continue from April 17 to May 31 at another prime location in front of The Land as part of the Epcot Flower and Garden Festival.

Highlighting plants for the 21st century, this exhibit, funded by the ASPP Education Foundation, will feature a laboratory with a bridge to a farmer's market. Visitors will see genetically improved corn that resists the European corn borer and improved potatoes that resist the Colorado potato beetle. A peek-a-boo box will illustrate the green fluorescent protein used in plant research. There will be a nerf gene gun demonstration. Visitors can observe and learn about edible vaccines, disease-fighting foods, soil-saving plants, and much more. ASPP member Carol Reiss will be a visiting scientist participating in the exhibit, along with a team of presenters who will be available to answer questions.

The exhibit links plant science to increased food production, better nutrition, disease prevention, new pharmaceutical products, and environmental conservation. It demonstrates plant breeding using biotechnology to meet world needs for food and novel plant products.

During the Epcot Flower and Garden Festival, a film crew will produce an eight-minute video and a video news release of the exhibit for ASPP. These videos will be available for use in presentations to the media and public.

New from ASPP!

Radical Biology:
Advances and Perspectives on the Function of Plant Roots

Edited by
Hector E. Flores
Jonathan P. Lynch
David Eissenstat

Proceedings
11th Annual Penn State Symposium
in
Plant Physiology
May 22–24, 1997

Book No. 30041
Member Price: $15.00 *($12.00 each for two or more copies)*
Nonmember Price: $25.00

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American Society of Plant Physiologists
15501 Monona Drive
Rockville, MD 20855-2768 U.S.A.

From Voodoo Science to Radical Biology

Ilya Raskin
Professor
Rutgers University

I constantly preach the virtues of staying focused to my students. I never tire of repeating that staying power and concentration make the difference between success and failure in science. And yet, looking back at the 18 years of my graduate and postgraduate research, I realize that I do not always practice what I preach.

As an undergraduate at Brandeis University, I was fortunate to meet my first two scientific mentors, Professors Attila Klien and Martin Gibbs. Overlooking my new immigrant status and heavy Russian accent, Attila introduced me to modern plant science. Martin, ignoring my taste for loud music and my annoying habit of running in the hallways, guided me to graduate school at Michigan State University. These were the first people who made a real difference in my scientific life, and fortunately not the last. Under the wise and watchful eye of my Ph.D. adviser, Hans Kende, I worked on ethylene physiology and the biophysics of aeration in rice. I still think of Hans as the individual who made a profound impact on my scientific thinking and ethics.

Unexpectedly, I received an offer to become a scientist at Shell Agricultural Chemical Company in Modesto, California. The offer meant skipping years of postdoctoral training and getting my own lab straight out of graduate school. Who could resist? I started working with chilling resistance, ABA-insensitive mutants in cereals, and, finally, with an ugly frog that turned into a real prince. That frog was the tropical voodoo lily, with its large and awkward inflorescence, notorious for intense heat and awful smell. Yet from this plant came the first evidence that salicylic acid was a regulator of plant development. The ugly plant made the cover of *Science* and *Nature*. And DuPont, which acquired Shell Agricultural Chemical Company almost on the day the discovery was made, allowed me to take my collection of voodoo lilies to its headquarters in Wilmington, Delaware.

However, the foul-smelling plant just didn't fit in with the shining name of the chemical giant DuPont. Following the insightful advice of Ralph Quatrano, my supervisor at DuPont, I switched to disease resistance. Through a collaboration with Professor Dan Klessig (Rutgers University), we soon discovered that salicylic acid was also an important regulator of this process. Ray Hammerschmidt and Jean-Pierre Metraux independently came to the same conclusion. Another *Science* paper was published and another project was born, which took me into the unfamiliar area of plant pathology.

Unfortunately, DuPont decided not to pursue the salicylic acid story. To appease me, the company put me in charge of developing new sugar beet herbicides and sent me on a tour of the sugar beet field trials—a complete fiasco. I could not tell sugar beet plants from weeds.

In 1989 I moved back to the academic life and took a faculty position at the new AgBiotech Center of Rutgers University, ably directed by Professor Peter Day. Leaving good colleagues and the state-of-the-art research facilities at DuPont was not easy. I was trading relative security and comfort for the constant worries and vagaries of academic life. But I was driven by the thought that in the university I would only do the things that I really liked doing. Well, I was wrong. To this day I still do many things I do not like to do. But at least I have a say in the matter.

At Rutgers we continued to unravel the biochemical and molecular mysteries of salicylic acid. We were helped by our collaborators, particularly by Professor Jean-Pierre Metraux (Fribourg University, Switzerland), a true friend, gentleman, and scholar. However, scientific projects are not immortal and often start to die the day they are born. The rule of diminishing returns often takes over, and one should always be prepared to give way to other talented laboratories joining the area. This is a normal path that moves science forward and rejuvenates it intellectually. However, certain tricks can delay or even temporarily reverse the inevitable; for example, digging sideways instead of deeper often brings more gold from the old mine. We followed this strategy and were rewarded with the discovery that methyl salicylate vapor, produced by virus-infected tobacco plants, was a powerful inducer of the defense response, possibly used in plant-to-plant communication. In spite of the claims made by the popular press after the original article was published in *Nature*, we have not yet proved that this

continued on page 14

Dr. Ilya Raskin won the 1993 ASPP Charles Albert Shull Award for innovative research that ties plant responses to underlying biochemical and physical processes.

continued from page 13

communication works outside the laboratory. However, we were flattered when *Discover* magazine placed the methyl salicylate story among the top 100 science stories of 1997.

Over time, I came to feel that something was missing from my work. Five years in industry had transformed my notion of how to think of science forever. I could no longer regard science as something that produces only knowledge. I never liked pinning fundamental or applied labels on research projects and always thought that research can only be good or bad. But at Rutgers, I decided that I wanted to do research that was, using business school terminology, market driven. Hence came phytoremediation, the use of plants to remove environmental pollutants from the environment. Here was an obvious opportunity to consolidate this desperately fragmented and mostly ignored area, spanning the border between plant science and environmental engineering, give it a credible scientific foundation, confirm its feasibility, and move it forward.

In 1993 Phytotech Inc., a university spin-off with the mission to commercialize phytoremediation of toxic metals, was born. From an amorphous idea, phytoremediation crystallized into buildings, employees, equipment, telephones, faxes, corporate logos, benefit packages, and tax bills. Collaboration between our laboratory and Phytotech resulted in the development of cost-effective methods for removing lead and other toxic metals from soils. The technology was proven effective in the field and began to generate revenues for the company in 1997.

By the mid-1990s, the efforts of a handful of groups led by Drs. Scott Cunningham, Rufus Chaney, Alan Baker, Milton Gordon, Gary Banuelos, Norman Terry, Joel Coats, Jerry Schnoor, Lee Wolf, and Ari Ferro, along with our own, led to the creation of a new scientific discipline with its own annual conferences, meeting sessions, workshops, information networks, calls for proposals, and so on. *Discover* magazine nominated phytoremediation for the International Science Innovation Award in 1997. My wife and I went to the award ceremonies in Disney World and watched our metal-munching plants featured at Epcot Center. It was the right time to lose focus once more and move on. But where?

Phytoremediation exploited the ability of plant roots to remove unwanted ingredients from their environment. But could the reverse of this process also be exploited? Could roots make valuable compounds and deliver them into their environment? We checked and found a new and unexplored world of bewildering chemical diversity. We realized that we were spying on the ruthless chemical warfare silently fought below the soil surface. In this underground war, delicate and physically unprotected roots try to survive in hostile territory scarce in nutrients and abundant with physical and biological enemies. Animals can run away and hunt for food, but roots have to stay put and defend their turf to the last drop of cytoplasm. Most likely they do it by accumulating or exuding chemicals that strike their enemies and attract their allies. We found our focus once again . . . this time in radical (root) biology and its underground secrets.

A series of fascinating laboratory observations about quantities, characteristics, and regulation of root exudation rapidly followed. Although not completely novel, these observations together held the key to a new technology of manufacturing valuable chemicals and recombinant proteins in plants. We called this technology "rhizosecretion." At its birth, rhizosecretion received a critical intellectual and financial boost from Dr. Yuri Gleba and the International Institute of Cell Biology (Kiev, Ukraine). Yuri's participation was invaluable. In science, just as in soccer or basketball, one scores by passing the ball to the most trusted members of the team.

Together we realized that rhizosecretion allows the production of large amounts of relatively pure natural products by continuously "milking" the hydroponically grown roots. Natural rubber and maple syrup are relatively cheap because they are harvested continuously throughout the life of the plant, whereas taxol is expensive because it is extracted from the dead plant as a minor component of a hopelessly complex mixture. In addition, root exudates turned out to be excellent sources of novel, biologically active compounds for uses in medicine and crop protection. The more we experimented with rhizosecretion, the more excited we became. Green plants instead of chemical plants! Dr. Chris Somerville and others have been promoting this idea for a very long time.

And what about recombinant proteins? Could plants be engineered to produce valuable recombinant proteins and continuously exude them from their roots into the hydroponic medium? Can roots outperform the recombinant udder of the famous Dolly, sheep of the year? We immediately imagined acres of hydroponic greenhouses churning tons of cheap insulin, erythropoietin, and serum albumin. First results were very promising. Tobacco plants that continuously exude significant amounts of three different recombinant proteins from their roots were successfully engineered and tested.

In December 1996, with help from the university, Photosynthetic Harvest Inc. (PHI), dedicated to the commercialization of rhizosecretion, was born. This transformation brought a substantial research grant to the university, which, playing by the rules, would not let us publish anything until three patents protecting the technology were filed.

So what's next? I believe that increasing the health value of food through manipulating secondary metabolism; inventing novel uses for plants, plant products, and plant genes in medicine, industry, and environmental remediation; designing effective screens and methodologies to identify novel plant-derived nutraceuticals, food supplements, and health care products; and other creative attempts to capture the value of chemical and genetic plant biodiversity will, to a large extent, guide plant science in the next century. I am starting to look for empty seats on this rapidly approaching train for my students, my postdocs, and myself.

Then what about staying focused? Can I still look the scientists in my laboratory in the eye and advise them to do it? When I think about the reasons some of them do better than others, I realize that those who do poorly focus on the scientific process for its own sake. They complain about "bad projects" and "bad luck" and mechanically follow protocols without questioning their effectiveness. Those who do better focus on finding a solution, though not necessarily to the problem they were given. Those who do best have a keen sense for truly significant problems and for the most direct path to a solution; in other words they have "a nose for science." They enjoy standing on the summit much more than the climb. Thus, they take their time scouting for the highest peaks and look for the fastest ways to get from one summit to another. They work very hard at it, knowing that the effort is another part of the success equation. I notice that most people will stop after finishing 95 percent of the task. Few give it 105 percent effort . . . above and beyond what is expected. But this extra 10 percent in staying power makes the decisive difference between failure and success. And the effect of the 10 percent rule is cumulative over one's lifetime.

So, looking back at my own patchwork of seemingly unrelated scientific projects, I would still preach to my laboratory the virtues of focusing . . . focusing on making a difference, not on treading the old path. And I would certainly encourage my junior colleagues to increase the throttle by 10 percent and not to ignore the dark alleys of plant science that may become the highways of tomorrow.

OBITUARIES

Herbert Stern

Herbert Stern, a pioneer of plant cell and molecular biology, died January 1, 1998, at the age of 79. Stern was emeritus professor of biology at the University of California, San Diego, where he played a major role in shaping its powerful Biology Department. He became a member of the department in 1965, soon after it was founded, and was one of its most durable leaders. He served as chair for 13 years, first from 1967 to 1975 and again from 1983 to 1986. His colleagues at UCSD remember him as a highly principled but gentle leader who guided the department during its formative years.

Stern was, in every sense, a pioneer in plant molecular biology. After completing his Ph.D. at McGill University, he was an associate at Rockefeller University from 1949 to 1955, where he helped develop some of the basic tools for plant cell biology. He worked with Allfrey, Mirsky, and others in devising fundamental techniques used in plant cell biology such as the isolation of nuclei from wheat germ. He carried out some of the first biochemical characterizations of nuclei and could even recount the days at "the Rock" when Ivan Sorvall was developing the refrigerated centrifuge. In 1955, Stern returned to Canada, where he was born, as head of biochemical cytology in the Canadian Department of Agriculture in Ottawa. In 1960, he came back to the United States to become professor of botany at the University of Illinois, Urbana.

Stern left an indelible mark on science through his studies of meiosis. Starting in the 1950s, he began his investigations of meiosis in the microsporocytes of developing anthers. He saw great opportunities in using microsporocytes to study meiosis because in these cells meiotic divisions are synchronous. He was fascinated by the dance of chromosomes, and in microsporocytes of Trillium and lily, the dance was spectacular because it was choreographed in unison. Stern reasoned that the synchrony of division was sufficiently compelling to pursue meiosis in plants such as lily, even though these plants had almost no genetics. He depended on others who studied meiosis in yeast or Drosophila to work out the genetic consequences of events during meiosis. The real virtue of the microsporocyte system was that it was amenable to biochemical analysis. In the 1960s, Stern teamed up with Yasuo Hotta, and they embarked on a partnership to study the biochemistry of meiosis. That partnership lasted for most of the rest of their scientific careers and was extremely productive.

Much of Stern and Hotta's work was based on the observation that although most DNA was synthesized in meiotic S-phase, a small amount of unscheduled DNA synthesis occurred in meiotic prophase. Meiotic prophase is the time when homologous chromosomes pair and undergo crossing over, and so the unscheduled DNA synthesis was thought to be related to these processes. The meiotic divisions in the microsporocyte system were so synchronous that Stern and Hotta could actually tease apart individual prophase stages, and in doing so, they found that the unscheduled DNA synthesis occurred in two stages at zygotene when chromosomes pair and at pachytene when recombination is thought to occur. The synthesis of "zygotene DNA" was a delayed semiconservative synthesis of a small part of the lily genome. The zygotene synthesis represented the synthesis of fairly long stretches of single or low copy number DNA sequences that constituted about 0.1–0.2 percent of the genome. The synthesis of "pachytene DNA," on the other hand, was not a semiconservative DNA synthesis, but appeared to be a programmed repair of moderately repeated DNA sequences. Zygotene DNA synthesis was a necessary precondition for the pachytene synthesis, which appeared to be a critical event in meiotic recombination.

Although Stern was a pioneer in plant molecular biology, he never really considered himself to be a Plant (with a capital P) biologist. He published most of his work in general biology journals, although occasionally also in *Plant Physiology*. He was invited three times to contribute reviews to the *Annual Reviews of Plant Physiology*. He used plants as an experimental system because of their utility in addressing important cell biological questions. He was devoted to a cellular process—meiosis—that is not unique to plants. In their study of meiosis, Stern and Hotta were just as content to grind up mouse testes as lily microsporocytes. Stern was a strong advocate, however, of the role of basic research in plant and animal science. He felt strongly that basic research enriched our lives and our culture and did not have to justify itself on the basis of its application in medicine or agriculture.

Stern celebrated life and was caught from time to time dancing on tables at holiday parties. He had a twinkle in his eye, an infectious grin, and a passion for science and art. We are all richer for the personal influence that Herb Stern had on the lives of his students, postdocs, and colleagues and for the unique contributions he made to science. Herb Stern is survived by his wife and four children, including his son David, who picked up the torch of plant molecular biology and is now a professor at the Boyce Thompson Institute and a coeditor of THE PLANT CELL. For information about contributions to the Stern fund, which plans to endow a chair in Herbert Stern's honor, contact shedrick@ucsd.edu.

Stephen S. Howell
Boyce Thompson Institute, New York

Commemoration of Philip Wareing's Life

Members of ASPP will remember the obituary for Professor Philip Wareing that appeared in the September/October 1996 issue of the *ASPP NEWS* (vol. 23, no. 5, p. 23). Several of his friends and colleagues have been seeking a way to commemorate Philip's life and work in an appropriate way, and the opportunity has now arisen. One of the most ambitious environmental projects ever attempted in Wales is being pioneered at Llanarthne in the Vale of Towy. A new National Botanic Garden of Wales, the Gardd Fotaneg Genedlaethol Cymru, is rising out of the woods and marshland on the site of ruined Middleton Hall, once a great country house with an extensive park. When completed, the Garden will be one of the most prestigious in the world, and when the first phases of the project reach maturity early in the next century, Wales will have a garden to rival Kew, or indeed any national botanic garden in the world.

Philip Wareing was devoted to the welfare of plant sciences in Wales, and because he began his career as a tree physiologist and retained an active interest in this area throughout his life, we believe that the woodland project outlined below would be the most fitting way to keep his memory fresh.

The main aim of the project is to restore the *Corylus* (hazels and filberts) plantation above the walled garden at the National Botanic Garden of Wales. This area will be developed as one with high biodiversity and will be open to the public throughout the year. It will be used for teaching students (primary school through adult-education level) about the problems in managing national plant collections. The two main components will be a collection of upward of 40 different species and cultivars of *Corylus* (propagations of plants from the National Fruit Collection at Brogdale would be

continued on page 16

continued from page 15

available at the Garden) and a comprehensive range of *Galanthus* (snow drops). An outstanding collection of *Galanthus* species and cultivars was recently donated to the Garden by the executors of the estate of the late Primrose Warburg, the widow of another well-known botanist, E. F. Warburg. It is thought that conversion to a working "coppice with standards" woodland could be an appropriate treatment for this area that would enhance the conservation and amenity activities of the Garden and be a fitting tribute to the memory of Philip Wareing.

The proposed site is about 0.6 hectare, or nearly 1½ acres, of seminatural woodland on a southeast-facing slope. The woodland contains several native tree species (hazel and some pears and cherries), and the ground vegetation includes large populations of both *Ranunculus ficaria* and *Arum maculatum* that exhibit a great deal of variation. Numerous bluebells and colonies of the local double-flowered Derwydd daffodil can also be found. Although the woodland contains a framework of good-quality native tree species, it has not been managed. The invasion of various woody weed species, (sycamore, hawthorn, and blackthorn) is causing both the shrub and ground vegetation to deteriorate.

Donations would allow—

- the judicious thinning of this woodland
- the acquisition of the *Corylus* collection
- the transplanting of spring flowering herb species from other sites in the Garden
- the planting of young trees and the creation of a network of pathways to allow visitors access to enjoy the Garden
- the production of bilingual leaflets and display boards outlining the purposes of the woodland.

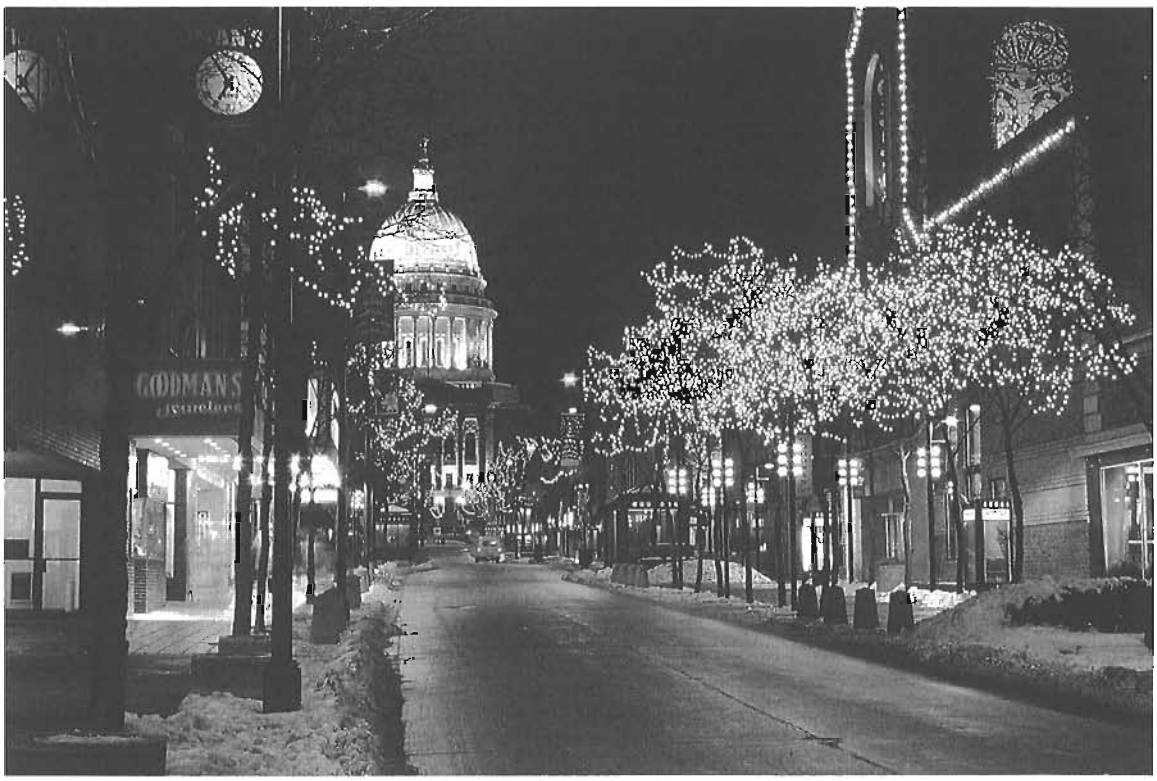
Equally important is the fact that every financial donation to the Garden will release an equivalent amount from the Millennium Commission to allow us to continue the creation of this long-awaited national institution for Wales.

Overseas contributors may make donations to the Philip Wareing Memorial Fund, UWA General Account, Midland Bank plc, Aberystwyth, Ceredigion, UK (Account: 01197339, Sort code: 40-08-09).

Charles Albert "Bud" Beasley

ASPP headquarters was recently informed of the death of member Dr. Charles Albert Beasley, who died on March 5, 1998.

Reserve June 27–July 1 for ASPP Plant Biology '98, Madison, Wisconsin



State Street, Madison, Wisconsin. Photo by William Patterson.

Gatherings

The *ASPP NEWS* publishes dates, titles, locations, and contact names and addresses for meetings, courses, seminars, and the like that are of interest to ASPP members. Submit announcements via e-mail to sbraxton@aspp.org or mail to Sylvia J. Braxton, *ASPP NEWS*, 15501 Monona Drive, Rockville, MD 20855-2768 USA. **Faxed transmissions are not accepted.**

FUTURE ASPP ANNUAL MEETING SITES

1998: Madison, Wisconsin
Saturday, June 27, through
Wednesday, July 1

1999: Baltimore, Maryland
Saturday, July 24, through
Wednesday, July 28

2000: San Diego, California
Saturday, July 15, through
Wednesday, July 19

1998

APRIL

April 16–17
Washington Section—ASPP Spring Research Meeting
Goucher College, Baltimore, Maryland
The deadline for abstracts is April 10, 1998. For information contact Douglas G. Luster, Secretary–Treasurer, WAS–ASPP, USDA–ARS, 1301 Ditto Avenue, Fort Detrick, MD 21702-5023; telephone 301-619-7338, e-mail luster@ncifcrf.gov.

April 19–22
The Phytochemical Society of Europe
Biosynthesis of Isoquinoline, Indole, and Related Alkaloids
Istanbul, Turkey
Contact: Professor G. Sariyar, Istanbul University, Faculty of Pharmacy, 34452 Beyazit, Istanbul, Turkey; telephone 90-212-526-0737, fax 90-212-519-0812.

April 27–May 2
The 3rd Asian Crop Science Conference: Regional Production Strategies to Meet Food Needs Toward the 21st Century
Taichung, Taiwan
For information, please contact Jih Min Sung, telephone 886-4-2870551, fax 886-4-2860267, e-mail acsc@dragon.nchu.edu.tw.

MAY

May 3–6
Beltsville Symposium in Agriculture XXIII
Fresh Fruits and Vegetables: Quality and Food Safety
USDA/ARS, Beltsville, Maryland
Organizers of the symposium: Kenneth C. Gross and Chien Yi Wang. For a preregistration form or other information, contact Kenneth C. Gross, USDA/ARS, Horticultural Crops Quality Laboratory, Building 002, 10300 Baltimore Avenue, Beltsville, MD 20705; telephone 301-504-6128; fax 301-504-5107, e-mail kgross@asrr.arsusda.gov; Web site http://www.barc.usda.gov/symp98/.

May 10–13
The Phytochemical Society of Europe
Progress in Phytochemistry
Kerkrade, The Netherlands
Contact: Professor Dr. A. W. Alfermann, Institut fur Entwicklungs- und Molekularbiologie der Pflanzen, Heinrich-Heine-Universität Dusseldorf, Universitätstrasse 1, Geb. 26.13, D-40225 Dusseldorf, Germany; telephone 49-211-811-4603, fax 49-211-811-3085, e-mail alferman@rz.uniduesseldorf.de.

May 19–26
Short Course: Microinjection Techniques in Cell Biology
Marine Biological Laboratory
Woods Hole, Massachusetts
Contact: Carol Hamel, Admissions Coordinator, Marine Biological Laboratory, 7 MBL Street, Woods Hole, MA 02543-1015; telephone 508-289-7401, e-mail admissions@mbl.edu.

May 21–24
The First Conference of the International Coenzyme Q10 Association
Boston, Massachusetts
For information contact Prof. Flint Beal, Neurology Service, Warren 408, Massachusetts General Hospital, Fruit Street, Boston, MA 02114; telephone 617-726-8463, fax 617-724-1480.

May 23–28
NABC Bioethics Institute
An International Conference
North Carolina State University, Raleigh
The deadline for applications is April 1, 1998, with preference given to those received by March 1. For more details, contact Professor Gary Comstock, 421 Catt, ISU, Ames, IA 50011-1306, telephone 515-294-0054, e-mail comstock@iastate.edu.

May 28–30
Phosphorus in Plant Biology: Regulatory Roles in Molecular, Cellular, Organismic, and Ecosystem Processes
Pennsylvania State University, University Park
Organizers: Jonathan Lynch and Jill Deikman. Contact: Jonathan Lynch, Department of Horticulture, Pennsylvania State University, University Park, PA 16802; telephone 814-863-2256; fax 814-863-6139, e-mail jpl4@psu.edu. For more details, visit our Web site at http://www.lsc.psu.edu/phys/annualsym.html.

May 30–June 4
The 1998 Meeting of the Society for In Vitro Biology
Bally's Las Vegas Hotel & Casino
Las Vegas, Nevada
Meeting registration deadline: May 15. Contact: Tiffany McMillan; telephone 301-324-5054; fax 301-324-5057. For more details, visit our site at www.sivb.org/cong1998.htm. Related sites are www.sivb.org/links.htm and www.sivb.org/plant.htm, and our homepage at www.sivb.org.

JUNE

June 2–6
8th International Symposium on Preharvest Sprouting in Cereals
Detmold, Germany
Contact: K. Niebuhr/D. Weipert, Assoc. of Cereal Research, Schutzenberg 10, D-32756 Detmold, Germany; telephone 49(0)5231-25530, fax 49(0)5231-20505 or M. K. Walker-Simmons, USDA–ARS, 209 Johnson Hall, Washington State University, Pullman, WA 99164-6420, e-mail ksimmons@wsu.edu.

June 2–7
8th International Conference on the Cell and Molecular Biology of Chlamydomonas
Tahoe City, California
Organizer: William J. Snell, University of Texas Southwestern Medical Center. Co-organizer: Elizabeth Harris, Duke University. For more information, check the Web site at http://www.swmed.edu/home_pages/chlamy/1998chlamy.html.

June 3–7
Graduate Research Ethics Education
A Workshop at Indiana University
Bloomington, Indiana
For information contact Brian Schrag, Ph.D., Project Director, "Graduate Research Ethics Education," Association for Practical and Professional Ethics, 410 North Park Avenue, Bloomington, IN 47405; telephone 812-855-6450, fax 812-855-3315, e-mail appe@indiana.edu, Web site http://php.ucs.indiana.edu/~appe/home.html.

June 4–6
Phytopharmaceuticals:
From Plant to Therapeutic
John Innes Centre, Norwich, United Kingdom
Organizing committee: Paul Christou, Deborah Gierdlestone, and Clare Robinson. For details and an application form, please contact Clare Robinson, John Innes Centre; telephone 44-1603-452571, fax 44-1603-456844, e-mail clare.robinson@bbsrc.ac.uk.

June 4–7
Joint Annual Association for the Study of Food and Society (ASFS) and Agriculture, Food, and Human Values Society (AFHVS) Meeting
Gateway Holiday Inn, San Francisco, California
Contact: Dr. Jacqueline M. Newman, Chairperson, FNES Department, Queens College, 65-30 Kissena Blvd., Flushing, NY 11367; telephone 718-997-4150, fax 718-997-4163, e-mail newman@qcvaxa.acc.qc.edu.

June 4–7
1998 Conference of the Association for the Study of Food and Society and the Agriculture, Food and Human Values Society
Gateway Holiday Inn
San Francisco, California
Contact: Barbara H. J. Gordon, San Jose State University, Nutrition and Food Science Department, 1 Washington Square, San Jose, CA 95192-0049; telephone 408-924-3105, fax 408-924-3114, e-mail bgordon@cruzio.com. Visit our Web site at http://www.iup.edu/~barker/.

June 14–19
IX International Congress on
Plant Tissue and Cell Culture
The ICC Jerusalem International
Convention Center
Jerusalem, Israel
For further information contact The Secretariat, IX International Congress on Plant Tissue and Cell Culture, P.O. Box 50006, Tel Aviv 61500, Israel; telephone 972-3-514-0000, fax 972-3-517-5674 / 972-3-514-0077, e-mail plant@kenes.com.

June 22–July 3
Short Course:
Postharvest Technology of Horticultural Crops
University of California, Davis
Contact: Ms. Sharon Munowich, University Extension, University of California, Davis, California 95616; telephone 916-757-8899, fax 916-757-8634, e-mail smunowit@unexmail.ucdavis.edu.

June 24–27
Fifth Annual "Teaching Research Ethics" Workshop
Indiana University, Bloomington
For information, contact Kenneth D. Pimple, "Teaching Research Ethics" Project Director, Poynter Center, Indiana University, 410 North Park Avenue, Bloomington IN 47405; telephone 812-855-0261, fax 812-855-3315, e-mail pimple@indiana.edu, Web address http://www.indiana.edu/~poynter/index.html.

June 24–28
9th International Conference on Arabidopsis Research
Madison, Wisconsin
Contact: Arabidopsis (arabidopsis@biochem.wisc.edu), fax 608-262-3453.

June 27–July 1
Plant Biology '98
Madison, Wisconsin
The American Society of Plant Physiologists annual meeting is scheduled "back to back" with the 1998 Arabidopsis meeting. Contact: Susan Chambers, 15501 Monona Drive, Rockville, MD 20855-2768; telephone 301-251-0560 ext. 11, fax 301-279-2996, e-mail chambers@aspp.org or via the World Wide Web at http://aspp.org.

JULY

July 1–3
8th Spanish Conference on Nitrogen Fixation
Pamplona, Spain
Contact: Cesar Arrese-Igor, Department Ciencias del Medio Natural, University Publica de Navarra, Campus de Arrosadia, E-31006 Pamplona, Spain; phone +34-48-169119, fax +34-48-169122, e-mail cesarai@upna.es.

July 5–August 14
Summer Course:
Exploration of Plant Science
NIU at Oxford, Oriel College
Oxford, United Kingdom
Northern Illinois University is offering a summer course in plant biology open to U.S. undergraduate and graduate students interested in short-term study abroad. For more information, please see Oxford Program Web site: http://www.niu.edu/acad/english/oxford.html or contact Dr. Gabriel Holbrook, Plant Molecular Biology Center, Northern Illinois University, DeKalb, IL 60115; telephone 815-753-3199, e-mail t80gph1@wpo.cso.niu.edu.

July 7–9
Micro 98
Royal Microscopial Society
International Microscopy
Conference & Exhibition
Novotel, Hammersmith, London
For registration forms and information, contact Royal Microscopial Society, 37/38 St. Clements, Oxford OX4 1AJ, United Kingdom; telephone 1-865-248786, fax 1-865-791237, e-mail info@rms.org.uk, Web site http://www.rms.org.uk.

July 7–10
25th Annual Meeting: Plant Growth Regulation Society of America
Chicago, Illinois
For information contact Dr. Warren Shafer, Abbott Laboratories, Agricultural Research Center, 6131 RFD (Oakwood Road), Long Grove, IL 60047; telephone 847-367-2654, fax 847-367-2913, e-mail pgrsa98@aol.com, Web address http://members.aol.com/pgrsa98.

July 12–17
IVth International Symposium on Cytochrome P450
Biodiversity and Biotechnology
Strasbourg, France
Information concerning this meeting and second circular can be obtained by e-mail at P450-98@ibmp-ulp.u-strasbg.fr. Information is also available from the Web P450 page: http://www.icgeb.trieste.it/p450/.

July 12–17
Gordon Conference on the Chemistry and Biology of Tetrapyrroles
Salve Regina University, Newport, Rhode Island
For information, please contact Gordon Research Conferences, University of Rhode Island, P.O. Box 984, West Kingston, RI 02892; telephone 401-783-4011, fax 401-783-7644; e-mail grc@grcmail.grc.uri.edu. The complete program of this meeting is posted on the Web at http://www.grc.uri.edu.

July 12–17
Gordon Research Conference:
Gravitational Effects on Living Systems, Evolution of Gravitational Sensing and Interaction with Other Sensory Systems
Colby-Sawyer College
New London, New Hampshire
Deadline for abstracts: June 1, 1998 (submit abstracts to Ruth Anne Eatock, The Bobby R. Alford Department of Otorhinolaryngology and Communicative Sciences, Baylor College of Medicine, One Baylor Plaza, Houston TX 77030). For more information, visit the Gordon Conferences general Web site at http://www.grc.uri.edu/ or the specific Web site for this Gordon Conference at http://140.254.14.55/grc/, or contact Mike Evans, Department of Plant Biology, Ohio State University, Columbus, OH 43210; telephone 614-292-9162, fax 614-292-6345, e-mail evans.20@osu.edu.

July 13–17
5th International Symposium on Inorganic Nitrogen Assimilation
Luso, Portugal
Organizers: Maria Améilia Martins-Loução, Cristina Cruz, Teresa Cabrita, Helena Freitas, Sara Amâncio. Contact: Secretariat ENAAG, Departamento de Biologia Vegetal, Faculdade de Ciências, de Lisboa, Campo Grande, Bloco C2, Piso 4, 1700 Lisboa, Portugal; telephone 351-1-757-3141, fax 351-1-750-0048, e-mail enaag@fc.ul.pt, Web address http://correio.cc.fc.ul.pt/~ENAAG.

July 13–25
Workshop Course on Molecular Techniques
Oregon State University, Corvallis
Contact: Gail Millimaki, Molecular and Cellular Biology Program, 3021 ALS, Oregon State University, Corvallis, OR 97331; telephone 541-737-3799, e-mail mcb@bcc.orst.edu.

July 19–24
Plant Molecular Biology Gordon Conference: Plant Biological Regulatory Mechanisms
New England College
Henniker, New Hampshire
Conference Chair: Pam Green; Vice Chair: Rob Last. The conference program may be viewed though the Gordon Conference Web site at http://www.grc.uri.edu. This site also provides online registration and other meeting information.

July 20–24
The Supporting Roots: Structure and Function
A Conference Sponsored by the University of Bordeaux, Bordeaux, France
Contact: Alexia Stokes, Laboratoire de Rhéologie du Bois de Bordeaux, Domaine de L'Hermitage, B.P. 10, 33610 Cestas Gazinet, France; telephone +33-5- 57-97-91-04; fax +33-5-56-68-07-13, e-mail stokes@lrbb3.pierroton.inra.fr.

July 22–24
Carbohydrate Metabolism in Plants, the Pathways and Their Control
A meeting IN MEMORIAM to honour Professor T. ap Rees
Queens College, Cambridge, United Kingdom
Organizers: Dr. M. M. Burrell, Professor J. A. Bryant, Dr. N. J. Kruger. For further information, contact Dr. M. M. Burrell, Advanced Technologies, Cambridge, Science Park, Cambridge CB4 4WA, UK; e-mail mmb.atc@dial.pipex.com.

July 26–31
1998 Phytochemical Society of North America Conference
"Phytochemicals in Human Health Protection, Nutrition and Plant Defense"
Pullman, Washington
Contact: Norman G. Lewis, Institute of Biological Chemistry, 467 Clark Hall, P.O. Box 646340, Pullman, WA 99164-6340; telephone 509-335-3412 (ask for Hiroko), fax 509-335-7643, e-mail lewisn@wsu.edu.

AUGUST

August 7–8
Tobacco Mosaic Virus: Pioneering Research for a Century
Edinburgh, Scotland
The meeting organizers are Professors T.M.A. Wilson and B. D. Harrison. For further information and registration materials, please send an e-mail inquiry to TMV@scri.sari.ac.uk. You can also view the program and obtain registration information at http://www.bspp.org.uk/icpp98/meetings/tmv100.htm.

August 9–14
Annual Meeting and Exhibits
Society for Industrial Microbiology
Adams Mark Hotel, Denver, Colorado
For more information, please contact the SIM office at 703-691-3357. Visit the SIM Web site at http://www.simhq.org or e-mail info@simhq.org.

August 9–14
11th International Workshop on Plant Membrane Biology
Cambridge, United Kingdom
Contact: Dr. Mark Tester, Department of Plant Sciences, University of Cambridge, Downing St., Cambridge, CB2 3EA, UK; telephone +44-1223-333918, fax +44-1223-333953, e-mail plant-nut@lists.cam.ac.uk.

August 13–17
16th International Conference on Plant Growth Substances
Makuhari Messe, Chiba, Japan
Organizer: Nobutaka Takahashi. For information contact http://frpphf.riken.go.jp/IPGSA/IPGSA98.html, or Dr. Yuji Kamiya, Plant Hormone Function, FRP RIKEN, Hirosawa 2-1, Wako-shi, Saitama 351-01, Japan; fax +81-48-462-4716, e-mail ykamiya@postman.riken.go.jp.

August 16–21
Gordon Research Conference
Cellular Basis of Adaptation to Salt and Water Stress in Plants
Queen's College, Oxford, United Kingdom
Chair: Andrew Smith; Vice Chair: Beth Bray. For more information, visit the GRC at http://www.grc.uri.edu/ or contact J.A.C. Smith, Department of Plant Sciences, University of Oxford, South Parks Road, Oxford, OX1 3RB, UK; telephone 44-1865-275009, fax 44-1865-275074, e-mail andrew.smith@plants.ox.ac.uk.

August 17–21
Sixth International Symposium on Genetics and Molecular Biology of Plant Nutrition
Elsinore, Denmark
For information, contact Arne Jensen, Plant Biology and Biogeochemistry Department, Riso, National Laboratory, P.O. Box 49, Building 330, DK - 4000, Roskilde, Denmark; e-mail arne.Jensen@risoe.dk or see http://www.risoe.dk.

August 23–28
6th International Mycological Congress, IMC6
Jerusalem, Israel
Contact: Secretariat, P.O. Box 50006, Tel-Aviv 61500, Israel; telephone 972-3-5140011, fax 972-3-5172265, e-mail mycol@kenes.com. See the program at http://lsb380.plbio.lsu.edu/ima/imc6prog.html.

SEPTEMBER

September 1–5
Cell Walls '98
8th International Cell Walls Meeting
John Innes Centre, Norwich, United Kingdom
Scientific Organizers: Keith Roberts, Maureen McCann, and Keith Waldron.
For a copy of the first circular; please contact the symposium secretary, Mrs. Gay Adams, at telephone 44-1603-452571, fax 44-1603-501771, e-mail gay.adams@bbsrc.ac.uk.

September 5–8
European Union TMR-Euroconference on Biology and Biotechnology of the Plant Hormone Ethylene II
Island of Santorini, Cyclades, Greece
Organizer and contact: Dr. Angelos K. Kanellis, National Agricultural Research Foundation, Institute of Viticulture and Vegetable Crops, PO Box 1841, GR-711 10 Heraklion, Crete, Greece; telephone/fax +30-81-245851, 245873, 242870, e-mail kanellis@nefeli.imbb.forth.gr, Web site www.imbb.forth.gr/ethylene.

September 7–19
Workshop Course on Molecular Techniques
Oregon State University, Corvallis
Contact: Gail Millimaki, Molecular and Cellular Biology Program, 3021 ALS, Oregon State University, Corvallis, OR 97331; telephone 541-737-3799, e-mail mcb@bcc.orst.edu.

September 13–16
The Phytochemical Society of Europe
Biologically Active Polysaccharides
Oslo, Norway
Paper deadline: May 1988. Contact: Professor B. S. Paulsen, Farmasoytisk, avd c, Postboks 1068 - Blindern, 0316 Oslo, Norway; telephone 47-2285-6572, fax 47-2285-4402, e-mail b.s.paulsen@farmasi.uio.no.

ASPP Placement Service

This form may be used only by members of the American Society of Plant Physiologists.
Please print or type your placement information on this form (curriculum vitae will not be accepted) and send it to:
Estella Coley, ASPP Headquarters, 15501 Monona Drive, Rockville, MD 20855-2768

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TELEPHONE _____ FAX _____ E-MAIL _____

I am seeking the following position (check all that apply):

[ ] Permanent [ ] Temporary [ ] Postdoctoral [ ] Industrial
[ ] Academic [ ] Government [ ] USA only [ ] Outside USA

US citizen? [ ] Yes [ ] No **Date available:** _____

Fields of interest, specialties, and publications titles: _____

Thesis, dissertation topics, professor: _____

Professional societies and honors: _____

Degree/year	Major	Minor	College/university and its location

Postdoctoral study (specialty and with whom, where, when): _____

Employer and location	From	To	Position, Title, Duties

References (names, addresses, telephone numbers):

ASPP Job Placement Service

I. Registering with the ASPP Placement Service and Obtaining Placement Files

ASPP headquarters in Rockville, Maryland, operates a placement service in which are kept active two files of resumes of individuals who are seeking employment. Employers are urged to survey the resume files for those seeking permanent positions and those seeking postdoctoral or similar positions. The files cost $25 each and may be ordered from Estella Coley, ASPP Placement Service, 15501 Monona Drive, Rockville, MD 20855-2768 USA. Those seeking employment should complete the Placement Service Form on the facing page to be included in the service.

II. Placing a Position Ad in *ASPP NEWS* and on the ASPP World Wide Web Homepage

Submit all ads by e-mail to Sylvia J. Braxton at sbraxton@aspp.org (or by mail to Sylvia J. Braxton, 15501 Monona Drive, Rockville, MD 20855-2768; **FAXED ADS ARE NOT ACCEPTED**). A fee of $150 for print, Web, or both is charged for all academic/government/industry permanent positions and for all positions, regardless of rank, posted by private companies (private nonprofit companies are not charged a fee). If a fee is charged for your ad, please include billing information at the time the ad is submitted.

- **Academic/Government/Industry Permanent Positions (Ph.D.)**: Limited to 200 words; ad will run 12 weeks on the Web and appear in one issue of *ASPP NEWS*. (If the ad runs only on the Web, the word limit is waived.)
- **Postdoctoral Positions** and **Research/Technical Positions (non-Ph.D.)**: At universities and government installations, limited to 100 words; at private companies, limited to 200 words. Ad will run 12 weeks on the Web and appear in one issue of *ASPP NEWS*. (If the ad runs only on the Web, the word limits are waived.)
- **Assistantships, Fellowships, Internships, etc.**: Announcements of programs and fellowships or internships for students seeking advanced degrees run at no charge and without a word limit. They will run two times in *ASPP NEWS:* the first time, they will run at full length; the second time, they will include location, contact name, and address, with a reference to the original posting. These announcements will run on the ASPP World Wide Web homepage for 12 weeks from the date of posting.

ACADEMIC/GOVERNMENT/INDUSTRY PERMANENT POSITIONS (Ph.D.)

Project Leaders
DEKALB Genetics Corporation
Mystic, Connecticut
(Received 01/30)

DEKALB Genetics Corporation is the fastest growing agricultural seed company in the United States. We seek bright, creative, and ambitious people to join our expanding biotechnology research team focused on the genetic improvement of crop plants. *Yield Improvement*: The successful candidate will help to initiate, direct, and implement research objectives directed toward increasing yield through the introduction and manipulation of transgenes. Candidates should have a Ph.D. in plant biochemistry, plant cell biology, or plant physiology, with a strong background in plant molecular biology, experience with transgenic plants, and good communication skills. Expertise in the manipulation of biosynthetic pathways and several years' experience in the supervision of scientific staff is preferred. *Enhanced Quality Traits:* The successful candidate will participate in development of novel transgenic plant products by characterizing transformation events at the molecular level, coordinating assays for trait expression, and working with plant breeding personnel to evaluate trait efficacy. This position requires a Ph.D. in an area of the life sciences, strong molecular biology expertise, and excellent communication and organizational skills. Experience in seed biology and a background in plant genetics are desirable. Positions are located at DEKALB's biotechnology research facility in Mystic, Connecticut, a scenic shoreline community located on Long Island Sound, halfway between New York and Boston. DEKALB offers competitive compensation, an attractive benefits package, and an outstanding working environment. Send cover letter, resume, and the names, addresses, and phone numbers of three professional references to Human Resources, DEKALB Genetics Corporation, 62 Maritime Drive, Mystic, CT 06355-1958; fax 860-572-5240. EOE. For more information on DEKALB, visit our Web site at http://www.dekalb.com.

Project/Associate Scientist
DEKALB Genetics Corporation
Mystic, Connecticut
(Received 01/30)

DEKALB Genetics is the fastest growing agricultural seed company in the United States. We seek bright, creative, and ambitious people to join our expanding biotechnology research team focused on the genetic improvement of crop plants. *Corn Transformation Technology Development:* The successful candidate will help develop novel technologies required for the efficient transformation of corn. Candidates should have a Ph.D. or an M.S. degree with experience in monocot transformation and molecular biology. The position is located at DEKALB's biotechnology research facility in Mystic, Connecticut, a scenic shoreline community located on Long Island Sound, halfway between New York and Boston. DEKALB offers competitive compensation, an attractive benefits package, and an outstanding working environment. Send cover letter, resume, and the names, addresses, and phone numbers of three professional references to Human Resources, DEKALB Genetics Corporation, 62 Maritime Drive, Mystic, CT 06355-1958; fax 860-572-5240. EOE. For more information on DEKALB, visit our Web site at http://www.dekalb.com.

Center Director
USDA Subtropical Agricultural Research Center
Weslaco, Texas
(Received 01/30)

The Agriculture Research Service is seeking applications for the position of Center Director for the Subtropical Agricultural Research Center, Weslaco, Texas. Weslaco is uniquely located in the Lower Rio Grande Valley in a major agricultural region and near major crossing points of the international border with Mexico. The Center Director provides direction to three research units, manages the extensive facilities, is accountable for all funds and federally owned property, and serves as a contact point for cooperative research with Texas A&M University and organizations in Latin America. Staff at the

MAXIMIZE YOUR JOB PROSPECTS!
Check ASPP's World Wide Web site (http://aspp.org/JOBS/) every Friday for new job listings.
Jobs with early application deadlines are listed on the Web site, but might not appear in *ASPP NEWS*.

center number about 125 full-time equivalents, including 30 research scientists. Research conducted by the center is a part of the National Research Program of the Agricultural Research Service. Major research areas include development of control strategies for pests of major agronomic importance to cotton, fruit, and vegetables; development of sustainable integrated cropping systems that are well adapted to the region; and development of technology to protect quality of citrus fruits and vegetables. The incumbent must be a U.S. citizen and have education and specialized experience related to the position. Salary is commensurate with experience, GS-15 ($76,000–$99,000). For application information and forms, contact Tommy Stanford, SDA, ARS, SPA, SARC, 2301 S. International Blvd., Weslaco, TX 78596; telephone 956-565-2606, e-mail sarcjob@rsru2.tamu.edu. For complete vacancy announcement see Internet site at http://www.ars.usda.gov/afm/hrd/vacancy/d8s-8093.htm. Applications in response to this advertisement should be marked ARS-D8S-8093(S-8-010). Applications must be postmarked by April 24, 1998. ARS is an equal opportunity employer. Women and minorities are encouraged to apply.

Postdoctoral Scientist
Monsanto Life Science Company
Middleton, Wisconsin
(Received 02/16)
The Agracetus Campus of Monsanto Life Science Company has a position available for a postdoctoral scientist in our protein expression group. The successful candidate will contribute toward our understanding and improving of post-translational modifications in plant storage organs. Candidates should have a Ph.D. in eukaryote molecular genetics or cell biology. Excellent communication skills and an ability to work in a team-based environment are critical. Interactions with other Monsanto locations working in gene expression, genomics, and crop breeding will be strongly encouraged. Agracetus, located in Middleton, Wisconsin, has an expanded and modern research campus with state-of-the-art plant transformation and greenhouse facilities. As part of a growing global company, we offer a competitive salary and benefits package. For consideration, please send your resume, cogently addressing the above criteria, and the names of three references to Agracetus Campus, Monsanto Life Science Company, Attn.: A. Kersten, 8520 University Green, Middleton, WI 53562; fax 608-836-9710, e-mail andrea.j.kersten@monsanto.com. Monsanto is an equal opportunity employer, drug-free workplace.

Molecular Biologist
Monsanto Life Science Company
Middleton, Wisconsin
(Received 02/16)
The Agracetus Campus of Monsanto Life Science Company has a position available for a Ph.D.-level scientist in our protein expression group. The successful candidate will contribute toward improvements in protein production in plant storage organs. Candidates should have a Ph.D. in molecular genetics, cell biology, or a related area, and relevant postdoctoral experience in eukaryote expression systems and post-translational processes. Excellent communication skills and an ability to work in a team-based environment are critical. Interactions with other Monsanto locations working in gene expression, genomics, and crop breeding will be strongly encouraged. Agracetus, located in Middleton, Wisconsin, has an expanded and modern research campus with state-of-the-art plant transformation and greenhouse facilities. As part of a growing global company, we offer a competitive salary and benefits package. For consideration, please send your resume, cogently addressing the above criteria, and the names of three references to Agracetus Campus, Monsanto Life Science Company, Attn.: A. Kersten, 8520 University Green, Middleton, WI 53562; fax 608-836-9710, e-mail andrea.j.kersten@monsanto.com. Monsanto is an equal opportunity employer, drug-free workplace.

Assistant Professor
OARDC/The Ohio State University
Wooster, Ohio
(Received 03/05)
The Department of Horticulture and Crop Science invites applicants for an 11-month, tenure-track assistant professor position in tomato genetics and breeding. The individual will use classical and molecular genetic approaches to develop and evaluate improved mechanically harvestable processing tomatoes with emphasis on developing wholepack and high viscosity types with high yield potential, wide adaptability, and improved stress tolerance. The candidate is expected to publish research results; interact with interdisciplinary research teams; develop research proposals; prepare and present research results; act as a liaison with industry groups and other research and educational institutions; develop and release new improved processing tomato lines and germplasm; and provide resident instruction through teaching and graduate student advisement in formal courses, seminars, individual studies, and academic counseling. Requirements: A doctoral degree in genetics/breeding, postdoctoral experience, and demonstrated research productivity. Applicants should forward by May 15 a curriculum vitae including a summary of research interests, and the names, addresses, and phone numbers of three references to Dr. John J. Finer, Department of Horticulture and Crop Science, The Ohio State University/OARDC, Wooster, OH 44691; e-mail finer.1@osu.edu. The Ohio State University is an equal opportunity/affirmative action employer. Qualified women, minorities, Vietnam-era veterans, disabled veterans, and individuals with disabilities are encouraged to apply.

Assistant Professor
The Ohio State University, Wooster
(Received 03/06)
An 11-month, tenure-track position is available July 1, 1998. The successful candidate will develop and deliver a strong nationally recognized, research-based extension program in commercial vegetable production focusing on potatoes, sweet corn, cabbage, and muck crops by establishing a strong rapport and working relationship with the Ohio vegetable industry through on-farm research, field days, grower visits, and other suitable activities. Primary research responsibilities will include comprehensive cultivar evaluations and focused discipline-related activities in the areas of stand establishment, environmental interactions, nutritional quality, water relations, or mineral nutrition. The person will advise and train M.Sc. and Ph.D. students, procure extramural funds to support their program, and collaborate with faculty in the College of Food, Agricultural and Environmental Sciences. The position requires a Ph.D. in horticulture or related field with training and experience in production, culture, management, and physiology of vegetable crops. Extension experience is desired. Successful candidate will receive competitive salary, medical and dental benefits, start-up funding, funded half-time technical support, and graduate assistant. Send curriculum vitae; transcripts; and a letter indicating career goals, extension/research interests, and qualifications, and arrange to have three letters of recommendation forwarded, to Dr. Ray Miller, Associate Chairman, Department of Horticulture and Crop Science, The Ohio State University–OARDC, Wooster, OH 44691; telephone 330-263-3669, fax 330-263-3887, e-mail miller.5@osu.edu. The Ohio State University is an equal opportunity, affirmative action employer. Women, minorities, Vietnam-era veterans, disabled veterans, and individuals with disabilities are encouraged to apply.

Assistant Professor
University of Connecticut, Storrs
(Received 03/09)
The Department of Plant Science invites applications for a tenure-track position. A Ph.D. in plant pathology or closely related area is required. Applicants should have research experience with molecular methods and plant diseases, interest in undergraduate teaching, and a record of scholarly contributions. The successful applicant will develop an externally funded research program emphasizing the molecular basis of plant pathogen–host plant interactions. Teaching responsibilities include an upper-division undergraduate course in plant diseases and a graduate course in an area of interest. The successful applicant will also be expected to support efforts to aid the state's agricultural industry in plant disease management. The academic year (9 months) is 60% research and 40% teaching. Applications will be considered until a suitable candidate is found. The position is available August 23, 1998. Submit a letter of application including a statement of interests and goals, vitae, official transcripts, three letters of recommendation, and reprints of no more than three recent publications to Dr. George C. Elliott, Plant Pathology Search Committee, Department of Plant Science, U-67, University of Connecticut, Storrs, CT 06269-4067; fax 860-486-0682, e-mail gelliott@canr1.cag.uconn.edu. AA/EOE. (Search # 98A262)

Assistant Professor
University of Florida, Gainesville
(Received 03/09)
Applications are invited for an 12-month tenure-track position with 80% research and 20% teaching responsibility. The appointee is expected to establish an independent research program in molecular mechanisms of plant disease resistance, including identification, isolation, characterization, and manipulation of disease resistance genes. The ultimate goal is to contribute to the understanding of mechanisms of resistance and to transfer such genes to crop plants of importance to Florida. Ph.D. in plant pathology, plant molecular biology, or related fields is required with a strong commitment to work on molecular genetic mechanisms of plant resistance to pathogens. The appointee will be expected to pursue competitive research grant funds. Applicants should submit a statement of research and teaching goals and interests, a curriculum vitae, graduate and undergraduate transcripts, list of publications, and three letters of reference, no later than May 15, 1998. Starting Date: July 1, 1998, or as negotiated. Send applications to Dr. Prem S. Chourey, Plant Pathology Department, University of Florida, Gainesville, FL 32611-0680; telephone 352-392-3631, fax 352-392-6532, e-mail psch@gnv.ifas.ufl.edu, Web site: http:\\plantpath.ifas.ufl.edu. EOE/AA.

Vegetable Post-harvest Physiologist
Washington State University, Pullman
(Received 03/12)
A full-time, 100% research position is available with a possible partial teaching appointment after 3 years. Participant of interdisciplinary team evaluates the influence of cultural practices and storage conditions on processor and consumer acceptability of potatoes. Appointee is expected to develop a program with national and international reputation of applied and fundamental research that supports the vegetable industries of Washington State. A Ph.D. in horticulture or a closely related plant/food science discipline is required. An ability to successfully interact with personnel engaged in post-harvest research, with leadership and management skills for team building and project supervision, is highly desirable as well as good oral and written communication skills; a willingness to share expertise through regional travel to examine potato production, harvesting, handling, and storage systems in the Pacific Northwest; and research experience with potato crops. Salary and rank are commensurate with candidate's qualifications. Send letter of application addressing qualifications, detailed resume with list of publications, copies of official transcripts, and three letters of reference to Dr. Robert Thornton, Search Chair, Department of Horticulture and Landscape Architecture, Washington State University, PO Box 646414, Pullman, WA 99164-6414; telephone 509-335-2989, fax 509-335-8690. Screening of applications begins May 15, 1998, and will continue until a suitable applicant is identified. EOE/AA/ADA.

POSTDOCTORAL POSITIONS

Postdoctoral Position
University of Florida, Gainesville
(Received 01/23)
A postdoctoral position is available beginning in May 1998 to work on metabolic engineering of the pathway of DMSP synthesis in plants. DMSP is a sulfur-containing osmoprotectant (see *Plant Physiol. 111*:965 and *116*:165). The current stage of the project involves isolating enzymes and genes for DMSP synthesis. Experience in plant molecular biology and biochemistry is essential. Send curriculum vitae detailing experience; a statement of research interests; and names, phone numbers, and e-mail addresses of three references to Dr. Andrew D. Hanson, University of Florida, Horticultural Science Department, PO Box 110690, Gainesville, FL 32611-0690; e-mail adha@gnv.ifas.ufl.edu.

Postdoctoral Position
University of Illinois, Urbana
(Received 01/23)
A postdoctoral position, open to U.S. citizens and permanent residents, is available immediately on an NSF interdisciplinary "Integrative Photosynthesis Training Grant" to work with Govindjee. Research involves biophysical, molecular biological, and biochemical studies on the mechanism of photosynthesis. Applicant background and interest will dictate the precise research project. Please send your curriculum vitae, research publications, statement of research interests, and three letters of recommendations (in sealed envelopes) to Govindjee, Department of Plant Biology, UIUC, 265 Morrill Hall, 505 South Goodwin Avenue, Urbana, IL 61801-3707. We are an equal opportunity employer and encourage women and minority applicants; e-mail gov@uiuc.edu; URL: http://www.life.uiuc.edu/govindjee/.

Postdoctoral Position
USDA–ARS Plant, Soil and Nutrition Laboratory
Cornell University, Ithaca, New York
(Received 01/28)
Funding is available immediately for an ARS postdoctoral associate to investigate the molecular biology and physiology of heavy metal transport and tolerance in the heavy metal hyperaccumulator plant species *Thlaspi caerulescens*. We have recently cloned a Zn transport cDNA from *Thlaspi caerulescens* and the research will address the molecular and physiological characterization of this cDNA and the transport protein it encodes. Applicants should have a Ph.D. in plant molecular biology, as well as research experience in recombinant DNA techniques, including in situ hybridization, immunolocalization, and plant transformation. Salary for this position is $34,839/year. Applicants should mail a curriculum vitae, statement of interest, and names of three references to Dr. Leon Kochian, U.S. Plant, Soil and Nutrition Laboratory, Cornell University, Tower Road, Ithaca, NY 14853.

Postdoctoral Position
University of California, Berkeley
(Received 01/29)
A postdoctoral position is available to study the regulation of the photosynthetic chlorophyll antenna size in chloroplasts. Salary starting at $30,000/year. The research employs mutagenesis, genetic, molecular, and biochemical approaches through which to elucidate the regulation of the light-harvesting chlorophyll antenna biosynthesis and assembly in chloroplasts. Further, the research seeks to characterize mutants with a permanently truncated chlorophyll antenna size for commercial applications. Candidates with experience in the molecular biology/biochemistry of photosynthesis should provide a curriculum vitae, names of references, and a brief description of previous research to Dr. A. Melis, University of California, Department of Plant and Microbial Biology, 411 Koshland Hall, Berkeley, CA 94720-3102; e-mail melis@nature.berkeley.edu.

Postdoctoral Position
University of California, Berkeley
(Received 01/29)
A postdoctoral position is available to study the photosystem-II repair process in chloroplasts. Salary starting at $30,000/year. The research employs genetic, molecular, and biochemical approaches for the identification and characterization of PSII repair mutants. DNA insertional mutagenesis is used to generate mutants, isolate the genes, and identify the enzymes responsible for the recovery of PSII from photoinhibition. Applicants with experience in the molecular biology/genetics of Chlamydomonas are asked to provide a curriculum vitae, names of references, and a brief description of previous research to Dr. A. Melis, University of California, Department of Plant and Microbial Biology, 411 Koshland Hall, Berkeley, CA 94720-3102; e-mail melis@nature.berkeley.edu.

Postdoctoral Positions
Purdue University, West Lafayette, Indiana
(Received 01/29)
Two postdoctoral positions are available to investigate Arabidopsis mutants that are resistant to transformation by Agrobacterium. We have previously identified approximately 20 such mutants in a T-DNA mutagenized population. Cloning and DNA sequencing of T-DNA junction, cDNA, and genomic clones has indicated that many of these genes are likely involved in plant cell wall biosynthesis (e.g., an arabinogalactan protein and a cellulose synthase-like protein), and the putative functions of these genes correlate with a decrease in bacterial binding to plant roots. Another disrupted gene encodes a histone H2A family member. A number of the transformation-deficient mutants are radiation-sensitive. Many other disrupted genes resulting in the transformation-deficient phenotype remain to be isolated and characterized. Candidates for these positions should have demonstrated experience in molecular genetics and genetic analysis. Salary will be commensurate with experience. Please send curriculum vitae and three letters of

recommendation to Dr. Stanton B. Gelvin, Department of Biological Sciences, Purdue University, West Lafayette, IN 47907; telephone 765-494-4939, fax 765-496-1496, e-mail gelvin@bilbo.bio.purdue.edu. Purdue University is an affirmative action/equal opportunity employer.

Assistant Specialist
The Plant Gene Expression Center
University of California, Berkeley
(Received 02/02)
An assistant specialist position is available for two years to investigate the signaling intermediates in the phytochrome phototransduction pathway of plants. The objective of this work will be to identify and isolate genes encoding such intermediates from Arabidopsis. Qualifications: Ph.D. in plant molecular biology or related field. Postdoctoral experience in plant photomorphogenesis, molecular genetics, and molecular biology. Experience in the use of Arabidopsis photomorphogenic mutants, production of transgenic plants, yeast two-hybrid screening, promoter, and transcription factor analysis. Send curriculum vitae and names of three references, by April 15, 1998, to Dr. Peter H. Quail, Plant Gene Expression Center, 800 Buchanan St., Albany, CA 94710; fax 510-559-5678. The University of California is an equal opportunity/affirmative action employer.

Postdoctoral Positions
Washington State University, Pullman
(Received 02/09)
Two postdoctoral positions are available to study the biochemistry of lipid metabolism in plants. The projects will expand on our current biochemical and molecular genetic investigations (e.g., *Plant Cell 8:*403, 1996; *Plant Physiol. 110:*923, 1996; *PNAS 94:*1142, 1997). Applicants should have experience in biochemistry and/or molecular biology, but prior work with plants is not essential. A cover letter detailing experience, a curriculum vitae, and three letters of reference should be sent to John Browse, Institute of Biological Chemistry, Washington State University, Pullman, WA 99164-6340; telephone 509-335-2293, fax 509-335-7643, e-mail jab@wsu.edu. Washington State University is an equal opportunity employer.

Postdoctoral Position
Ohio University, Athens
(Received 02/19)
A postdoctoral position is available to study the structure and function of a novel tomato arabinogalactan-protein (AGP) (*Plant Mol. Biol. 32:*641–652, 1996). The postdoc will engineer/analyze transgenic tomato plants and participate in biochemical characterization of this AGP. Experience in molecular biology and transgenic plant research is essential; experience in characterizing glycoproteins is desirable. A salary of $25,000 plus benefits is available. Applicants should send a cover letter detailing experience, curriculum vitae, and three letters of reference to Dr. Allan Showalter, Ohio University, Department of Environmental and Plant Biology, Athens, OH 45701; fax 614-593-1130, e-mail SHOWALTER@ouvaxa.cats.ohiou.edu. OU is an EEO/AA employer.

Postdoctoral Position
USDA–ARS, Kearneysville, West Virginia
(Received 02/24)
The USDA–Agricultural Research Service (ARS) is seeking a highly motivated temporary scientist postdoctoral associate position not to exceed 2 years, to conduct research on transformation of pear (*Pyrus communis*) for disease resistance. The research will require gene vector construction and testing; the production of transgenic pear plants; and assays of gene insertion, gene expression, and disease resistance in both pear and herbaceous model systems. Candidates must have a high level of expertise in plant molecular biology and skill in plant transformation. Salary is commensurate with experience (GS-9/11; $32,457–$39,270), and a benefit package is also included (health and life insurance). For further information on the position, contact Ralph Scorza or Richard Bell at 304-725-3451. For application information and forms, contact Janie E. Cart at 301-344-4569. Applications must be postmarked by April 17, 1998. USDA–ARS is an equal opportunity employer. Women and minorities are encouraged to apply.

Postdoctoral Position
Waksman Institute, Rutgers—The State University of New Jersey, Piscataway
(Received 02/27)
A postdoctoral position is available immediately at the Waksman Institute, Rutgers—The State University of New Jersey. Extensive experience in protein purification (preferably from plants) is absolutely essential. The research projects involve purification and cloning of ligand-binding proteins from plants. Send a curriculum vitae to Daniel Klessig either by e-mail to klessig@mbcl.rutgers.edu or by first class mail to Waksman Institute, Rutgers—The State University of New Jersey, 190 Frelinghuysen Road, Piscataway, NJ 08854-8020. Rutgers—The State University of New Jersey is an equal opportunity employer.

Postdoctoral Research Position
Samuel Roberts Noble Foundation
Ardmore, Oklahoma
(Received 03/05)
A postdoctoral position is available to investigate the function of a novel gene regulated in response to phosphate starvation and colonization by mycorrhizal fungi (Burleigh and Harrison, *Plant Mol. Biol. 34:*199–208, 1997). The gene has the potential to encode short peptides, and it is possible that one of these acts as a signal in the phosphate deprivation response. Transgenic plants overexpressing the gene have been prepared. The position is initially available for two years with the possibility of renewal for an additional year. Applicants should have a strong background in plant biochemistry and molecular biology. To apply, send a letter outlining research interests, a curriculum vitae, and names of three references to Dr. Maria J. Harrison, Plant Biology Division, Samuel Roberts Noble Foundation, 2510 Sam Noble Parkway, Ardmore, OK 73401; telephone 580-223-5810, fax 580-221-7380, e-mail mjharrison@noble.org.

Postdoctoral Position
University of California, Berkeley
(Received 03/06)
A postdoctoral position is available to study responses of photosynthetic organisms to excess light. A combination of genetic and physiological approaches will be used to characterize Chlamydomonas and Arabidopsis mutants defective in regulation of photosynthesis and/or antioxidant metabolism. A background in molecular genetics, photosynthesis, or physiological ecology is preferred. Send letter of application, curriculum vitae, and three letters of reference to Dr. Krishna K. Niyogi, Department of Plant and Microbial Biology, 111 Koshland Hall, University of California, Berkeley, CA 94720-3102.

Postdoctoral Position
University of Missouri, Columbia
(Received 03/11)
The Biochemistry Department of the University of Missouri, Columbia, invites applications for a postdoctoral position in plant molecular biology or plant biochemistry. The department has strong programs in plant enzymology, molecular biology, and phytohormones, and this position would be working directly with Dr. Morris on genes and enzymes related to cytokinin metabolism. Applications from qualified members of minority groups and women are strongly encouraged. Please send a curriculum vitae, a statement of research experience, and three letters of reference to Dr. R. O. Morris, Biochemistry Department, 117 Schweitzer Hall, University of Missouri, Columbia, MO 65211; telephone 573-882-5186, fax 573-884-4695. The University of Missouri is an affirmative action/equal opportunity employer.

RESEARCH/TECHNICAL POSITIONS (Non-Ph.D.)

Research Associates or Research Assistants
DEKALB Genetics Corporation
Mystic, Connecticut
(Received 01/30)
DEKALB Genetics Corporation is the fastest growing agricultural seed company in the United States. We seek bright, creative, and ambitious people to join our expanding biotechnology research team focused on the genetic improvement of crop plants. *Transgene Development:* Successful candidates will perform DNA cloning, gene isolation, and vector construction, as well as protein isolation, characterization, and assays. Candidates should have a B.S./B.A. or an M.S. degree in biochemistry, biology, genetics, or a related field, with at least two years of lab experience, preferably with plant biology. Positions are located at DEKALB's biotechnology research facility in Mystic, Connecticut, a scenic shoreline community located on Long Island Sound, halfway between New York and Boston. DEKALB offers competitive compensation, an

attractive benefits package, and an outstanding working environment. Send cover letter, resume, and the names, addresses, and phone numbers of three professional references to Human Resources, DEKALB Genetics Corporation, 62 Maritime Drive, Mystic, CT 06355-1958; fax 860-572-5240. EOE. For more information on DEKALB, visit our Web site at http://www.dekalb.com.

Research Associates
DEKALB Genetics Corporation
Mystic, Connecticut
(Received 01/30)
DEKALB Genetics Corporation is the fastest growing agricultural seed company in the United States. We seek bright, creative, and ambitious people to join our expanding biotechnology research team focused on the genetic improvement of crop plants. *Functional Genomics:* The successful candidates will develop methods to efficiently produce and identify insertional mutations in maize. DNA manipulation, gene isolation, vector construction, and genetic manipulation of maize will be performed. Candidates should have an M.S. degree or equivalent in a biological science, preferably in genetics or molecular biology. *DNA Marker Lab Manager:* The successful candidate will be responsible for the daily operations and scheduling of a high-volume DNA marker lab. Candidates should have at least an M.S. degree or equivalent in a biological science. Supervisory experience and significant technical expertise in DNA analysis, including Southern and PCR analysis with computer skills, are required. Positions are located at DEKALB's biotechnology research facility in Mystic, Connecticut, a scenic shoreline community located on Long Island Sound, halfway between New York and Boston. DEKALB offers competitive compensation, an attractive benefits package, and an outstanding working environment. Send cover letter, resume, and the names, addresses, and phone numbers of three professional references to Human Resources, DEKALB Genetics Corporation, 62 Maritime Drive, Mystic, CT 06355-1958; fax 860-572-5240. EOE. For more information on DEKALB, visit our Web site at http://www.dekalb.com.

Controlled Environment Specialist
University of Maryland, College Park
(Received 02/17)
The University of Maryland announces a position for a controlled environment specialist to manage the growth chamber facility in our new Plant Sciences Building. Applicants should have a B.S or an M.S degree equivalent experience and be familiar with the engineering aspects of controlled environments. Knowledge of systems integration and computerized monitoring and control are essential for this position. The position is a 12-month associate staff position with full benefits. Please send letter of application, resume, and three letters of recommendation to Dr. Gerald F. Deitzer, Department of Natural Resource Sciences, University of Maryland, College Park, MD 20742-4452.

Postdoctoral Fellow or Research Associate
Waksman Institute, Rutgers University
Piscataway, New Jersey
(Received 02/19)
A non–tenure track research position is available to characterize the plastid RNA polymerases and their role in plastid function and development using biochemical and transgenic approaches. Appointment at the Research Associate level requires at least three years of relevant postdoctoral research. Salary commensurate with experience. Please send your curriculum vitae and the names and addresses (phone, fax, e-mail) of three references to Dr. Pal Maliga, Waksman Institute, Rutgers University, 190 Frelinghuysen Road, Piscataway, NJ 08854-8020; fax 732-445-5735, e-mail maliga@mbcl.rutgers.edu. AA/EOE.

Research Associate
Waksman Institute, Rutgers University
Piscataway, New Jersey
(Received 02/19)
Applications are invited for a non–tenure track research position to work on plastid transformation in *Arabidopsis thaliana*. Research will include transformation, vector, and marker gene construction and characterization of transgene expression. At least four years of postdoctoral experience is required in the area of Arabidopsis and/or Brassica tissue and protoplast culture. Experience in chromosome analysis and molecular biology techniques is desirable. Salary commensurate with experience. Please send your curriculum vitae and the names and addresses (phone, fax, e-mail) of three references to Dr. Pal Maliga, Waksman Institute, Rutgers University, 190 Frelinghuysen Road, Piscataway, NJ 08854-8020; fax 732-445-5735, e-mail maliga@mbcl.rutgers.edu. AA/EOE.

Specialist I
New Mexico State University, Las Cruces
(Received 02/24)
New Mexico State University (NMSU) is seeking candidates for a Specialist I, Plant Genetics. Bachelor's degree in molecular biology, microbiology, biochemistry, or related field is required. Master's or Ph.D. degree is preferred. Minimum of 2 years of experience is required in molecular biology, microbiology, and/or biochemistry. Full-time position is contingent upon funding. Salary is commensurate with qualifications and experience. Applications must be received by March 9, 1998. Send letter of application, résumé, and three references to Dr. John Kemp, Director, Plant Genetic Engineering Laboratory, MSC 3CL, P.O. Box 30003, New Mexico State University, Las Cruces, NM 88003. NMSU is an EEO/AA employer.

Lab Researcher IV
Waksman Institute, Rutgers University
Piscataway, New Jersey
(Received 03/02)
A position is available for a qualified individual to carry out research in plant molecular genetics and to assist in the management of the laboratory. A minimum of two years' experience beyond college in a molecular biology research laboratory is required. Proficiency in recombinant DNA technology (PCR, genomic cloning, subcloning, Southern and Northern blot analysis, DNA sequencing, and so on) is essential. Familiarity with plants helpful. Coauthorship in publications is expected. Salary commensurate with experience, plus a comprehensive benefits package. Please forward your resume to Dr. Hugo K. Dooner, Waksman Institute, Rutgers University, Hoes Lane, Room 2006, Piscataway, NJ 08855; e-mail dooner@mbcl.rutgers.edu.

ASSISTANTSHIPS, FELLOWSHIPS, INTERNSHIPS, ETC.

USDA National Needs Graduate Fellowships
Iowa State University, Ames
(Received 01/27)
USDA National Needs Graduate Fellowships in Plant Biotechnology are available from the Interdepartmental Plant Physiology Major (IPPM) at Iowa State University. This award represents the third consecutive USDA National Needs grant in plant biotechnology awarded to IPPM, an established interdepartmental/intercollegiate graduate program that stresses development of a strong background in fundamental plant biology and, by its nature, fosters development of a broad, interdisciplinary research perspective. The fellowships carry a stipend of $17,000/year for three years, and fellows will be able to pursue their dissertation research with any of the 31 IPPM faculty from the seven different participating departments (agronomy, biochemistry and biophysics, botany, forestry, horticulture, plant pathology, and zoology and genetics). Only U.S. citizens and permanent residents are eligible, and awards are restricted to Ph.D. students. Iowa State University is committed to excellence in graduate education and to excellence in plant biology. Biotechnology education and research are major areas of emphasis at ISU, as demonstrated by a large investment in this area at ISU by the State of Iowa over the past two decades. ISU also has a long history of excellence in both basic and applied plant biology, including world-renowned scientists/educators in plant physiology, genetics, and plant breeding. IPPM faculty are active in teaching, research, and technology transfer. All support active, high-quality research programs with extramural funding and publish in high-quality, refereed journals. As a result of these factors, ISU has the faculty, facilities, educational programs, and reputation to educate and train top-quality graduate students from throughout the USA for careers in plant biology and biotechnology. If you would like more information about these fellowships, please contact Dr. Martin Spalding, Chair, Interdepartmental Plant Physiology Major, Iowa State University, Ames, IA 50010; e-mail ippm@iastate.edu. If you would like more information about IPPM, please visit our Web page at http://www.public.iastate.edu/~ippm.

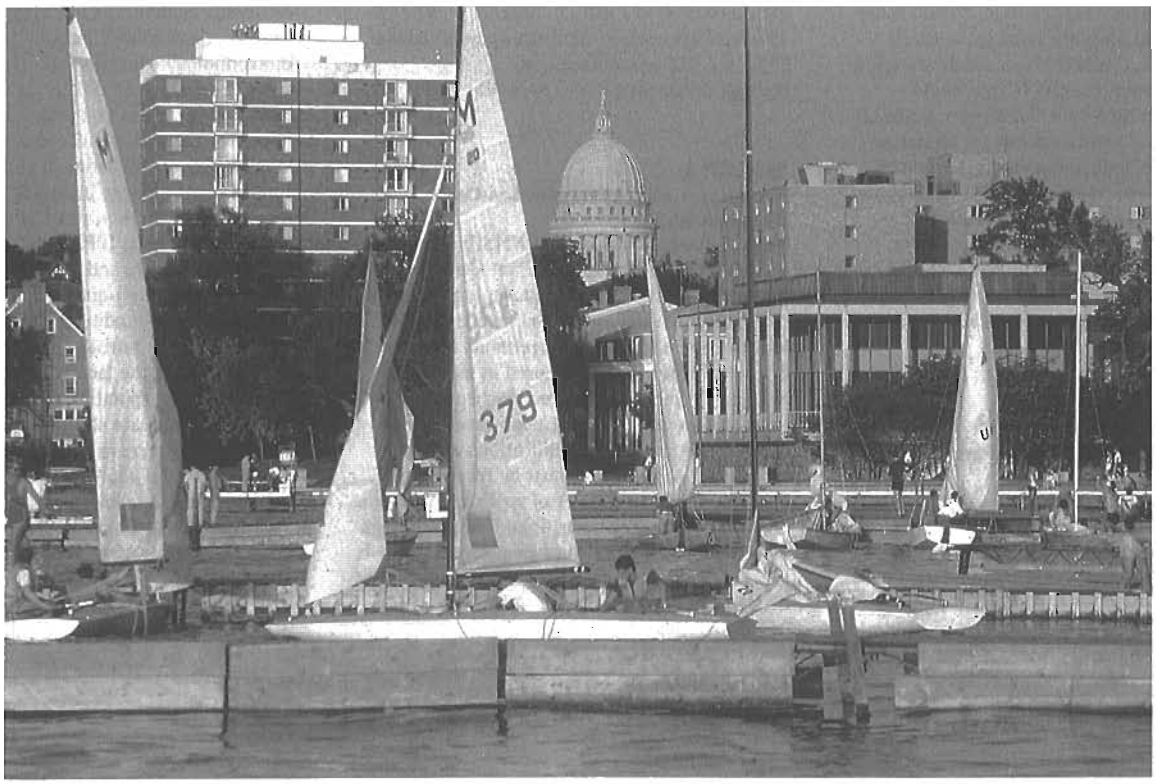
Graduate Research Assistantship
Oklahoma State University, Stillwater
(Received 03/09)
A graduate assistantship is currently available through the Department of Plant and Soil Sciences at Oklahoma State University. The assistantship carries a stipend of $16,500/yr (including a $4,000/yr scholarship) for two years for an M.S. or a Ph.D. student. Only U.S. citizens

are eligible for consideration. The project involves isolation and characterization of novel leaf-rust induced genes in wheat using the differential display technique and other techniques. The project seeks to better define the wheat–rust interaction at the molecular level. Excellent research laboratory facilities are available in the Noble Research Center on the Oklahoma State Campus, including the NSF-funded Recombinant DNA/Protein Facility and the Plant Transformation Facility all located within a one-minute walk of the laboratory. The candidate should have a GPA of 3.5 or greater and research and academic experience in molecular biology, biochemistry, or plant physiology. Expertise in agarose gel electrophoresis, gene cloning, cDNA library screening, DNA sequencing, Northern and Southern blotting, and/or PCR will be preferred. Interested candidates should submit a concise one- to two-page letter of intent to Dr. Michael P. Anderson via e-mail at mpa@soilwater.agr.okstate.edu outlining interest and qualifications. Further information such as transcripts and resume will be requested from the most qualified candidates. For further information contact Dr. Michael P. Anderson, Department of Plant and Soil Sciences, Oklahoma State University, Stillwater OK 74078; telephone 405-744-6939.

Graduate Research Assistantships
Plant Molecular & Cellular Biology Program
University of Florida, Gainesville
(Repeat)
Contact: For assistantship application forms, contact PMCB@gnv.ifas.ufl.edu. (Details January/February 1998 *ASPP NEWS*)

Graduate Fellowships in Plant Biotechnology with an Emphasis on Bioprocessing
Worcester Polytechnic Institute
Worcester, Massachusetts
(Repeat)
Contact: Professor Pam Weathers, Department of Biology and Biotechnology, Worcester Polytechnic Institute, Worcester, MA 01609; e-mail weathers@wpi.edu. View our Web page at http://www.wpi.edu/Academics/Depts/Bio/IPRG/index.html. Awards are contingent upon receipt of federal funding. (Details January/February 1998 *ASPP NEWS*)

Madison, Wisconsin: Site of Plant Biology '98



Madison, Wisconsin. Photo by Zane Williams.

A Look Beyond Transcription: Mechanisms Determining mRNA Stability and Translation in Plants

Edited by
Julia Bailey-Serres and Daniel R. Gallie

A Look Beyond Transcription:
Mechanisms Determining mRNA Stability and Translation in Plants

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