

NP 308

Methyl Bromide Alternatives Panel Report

Christina Woods, Program Analyst
Office of Scientific Quality Review



Michael S. Strauss, Peer Review Program Coordinator

March 20, 2008
Date



Thomas E. Cleveland, Scientific Quality Review Officer

March 31, 2008
Date



Office of Scientific Quality Review
Agricultural Research Service
United States Department of Agriculture

This Panel Report provides the background on the 2007 National Program (NP) 308 Methyl Bromide Alternatives Panel Review. The project plans reviewed by these panels were applicable to the mission of this National Program to “develop environmentally compatible and economically feasible alternatives to the use of methyl bromide as a soil and postharvest commodity treatment.”

The National Program Leaders, Drs. Sally Schneider and Ken Vick divided 14 projects into two peer review panels. After considering several candidates for a Panel Chair for each panel, Dr. Thomas (Ed) Cleveland, Scientific Quality Review Officer appointed Chairs for each panel (Table 1).

Table 1. Breakdown of the Methyl Bromide Alternatives Panels

| Panel | Panel Chair | Number of Panelists | Number of Projects Reviewed | Panel Meeting Date |
|--------------------------|--|---------------------|-----------------------------|-----------------------|
| NP 308 Postharvest Panel | Dirk Maier, Professor & Associate Head, Department of Agricultural and Biological Engineering, Purdue University, West Lafayette, In | 3 | 6 | September 18-19, 2007 |
| NP 308 Soils Panel | Frank Louws, Associate Professor, Department of Plant Pathology, North Carolina State University, Raleigh, NC | 6 | 8 | September 17-18, 2007 |

Dr. Michael Strauss, Peer Review Program Coordinator, and Dr. Cleveland presented an orientation to the Panel Chairs. Dr. Cleveland subsequently approved the candidate panelists selected by each. The approvals took into account conflicts of interest and followed guidelines for diversifying panel composition geographically, institutionally, and according to gender and ethnicity. Panelists demonstrated a recognizable level of recent research within their respective fields of methyl bromide alternatives. The panels received a telephone/web-based orientation. The National Program Staff provided an overview of the NP 308 Methyl Bromide Alternatives program. All panels convened in the George Washington Carver Center, Beltsville, Maryland.

Panel Review Results

Along with the panel’s written recommendations, OSQR sends each research team’s Area Director a worksheet that shows each reviewer’s judgment of the degree of revision their project plan requires. This judgment is referred to as an “action class.” The action classes are also converted to a numerical equivalent, averaged, and a final action class rating is assigned.

If the action class is:

No Revision Required. No revision is required, but minor changes to the project plan may be made.

Minor Revision Required. The project plan is basically feasible as written but requires some revision to increase quality to a higher level.

Moderate Revision Required. The project plan is basically feasible as written but requires moderate revision to one or more objectives, perhaps involving changes to the experimental approaches, in order to increase quality to a higher level. The project plan may also need some rewriting for greater clarity.

Scientists are required to revise their project plan as appropriate and submit a formal statement to their Area Director demonstrating their response to the Panel's recommendations. The project plans are implemented following a certification from the SQR Officer.

Major Revision Required. Substantial revision to one or more objectives is necessary, but the project plan should be sound and feasible after significant revision.

Not Feasible. The project plan has major flaws or deficiencies, and cannot be simply revised to produce a sound project. If the project is terminated, a complete redesign and rewrite are required.

Scientists respond to the Panel's recommendations, revise their project plans, and have them re-reviewed by members of the panel. The project plans are implemented upon receiving a more favorable peer review. Though rare, Area Directors may request a postponed peer review or termination for project plans that cannot be promptly improved. Projects are reviewed no more than two times by the original panel. See Figures 1 and 2 for the distribution of initial and final scores assigned by the first (2002) and second (2007) cycle Methyl Bromide Alternatives Panels.

In the first cycle of the NP 308 Panel Review, the panelists were impressed with the quality and quantity of research in the plans. However, many of the plans needed more details under procedures or experimental design and also under contingency plans. The second cycle panelists expressed confidence in the research and research teams but they too felt that some plans lacked or were deficient in the experimental design. Where they scored plans low they indicated that it was largely due to lack of adequate information to enable them to fully assess the science.

The first cycle panelists felt that there was too high of a concentrated effort into biological control research and not enough on things agricultural industries were presently using such as chemical controls. The second cycle panelists felt that the program would benefit from an overall genetics/breeding approach. While those breeding programs may exist, they should include factors important to the decline of Methyl Bromide usage.

The first cycle's initial and final action class score was minor revision. The second cycle's initial action class scored was moderate revision and their final action class score was raised to minor revision.

Figure 1. Initial Review Scores for First (2002) and Second (2007) Cycle Distribution for NP 308 Methyl Bromide Alternatives Panels (average score 5.04; 4.53, respectively).

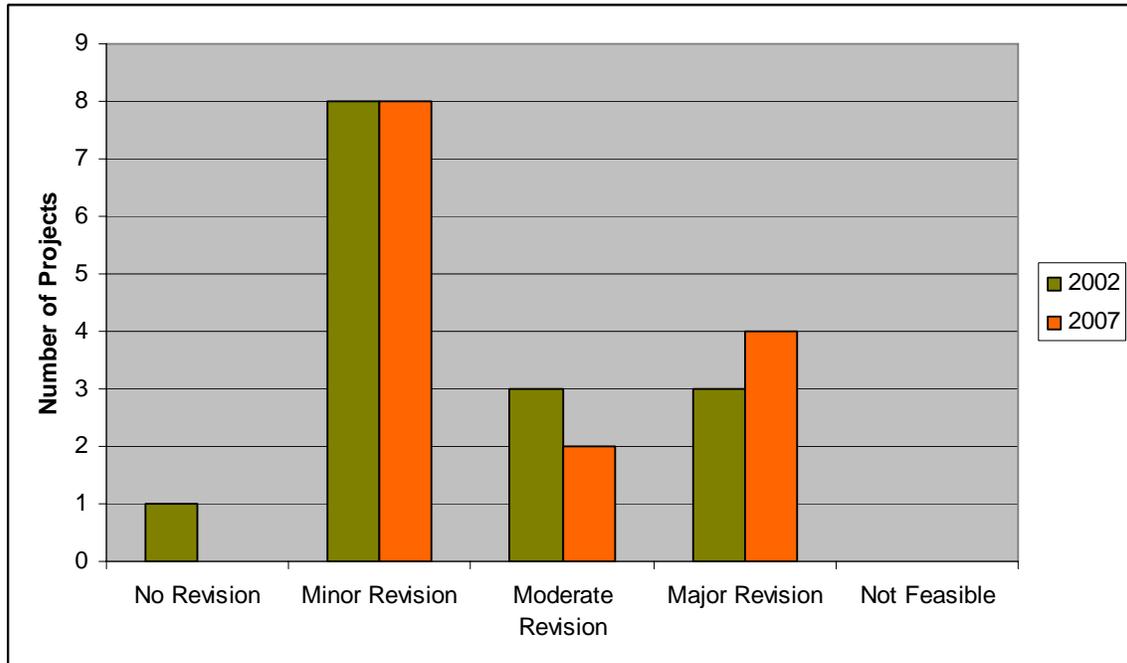


Figure 2. Final First (2002) and Second (2007) Cycle Score Distribution for the NP 308 Methyl Bromide Alternatives Panels (average score 5.94; 5.97, respectively).

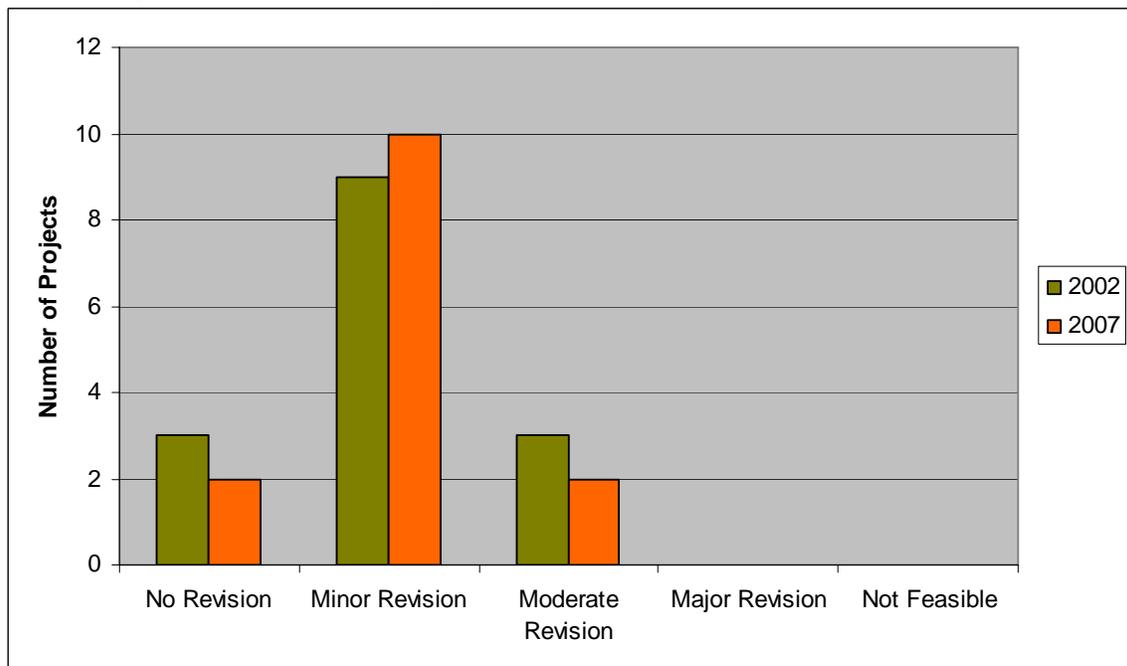


Figure 3. Initial Scores for the First (2002) Cycle Methyl Bromide Alternatives Panels

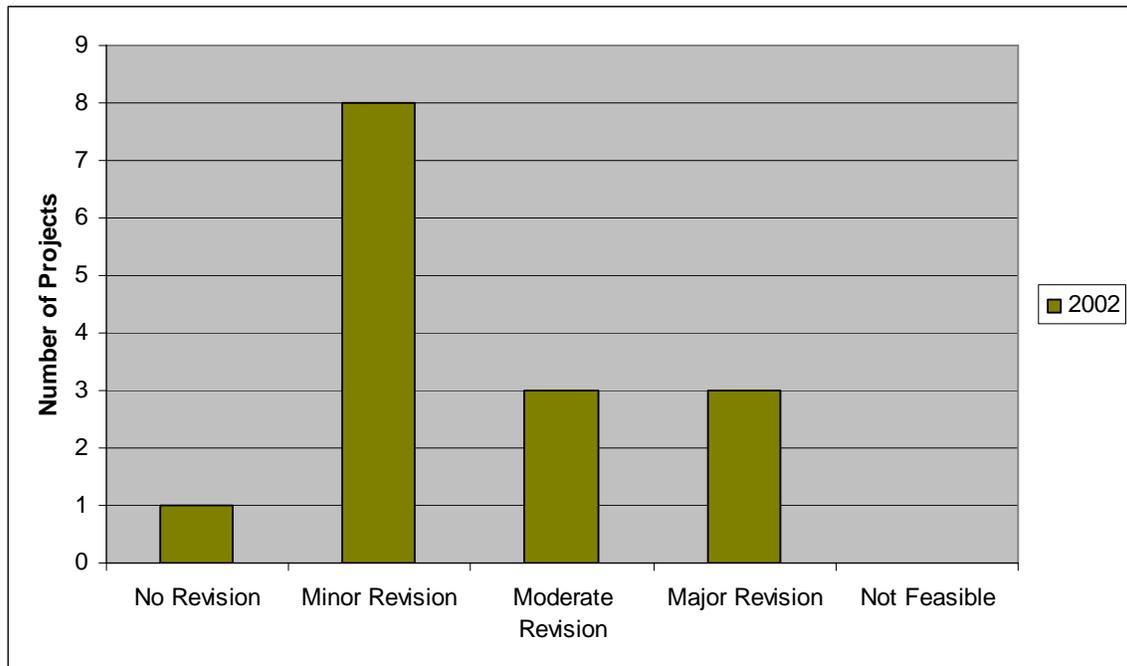


Figure 4. Re-Review Scores for the First (2002) Cycle Methyl Bromide Alternatives Panels

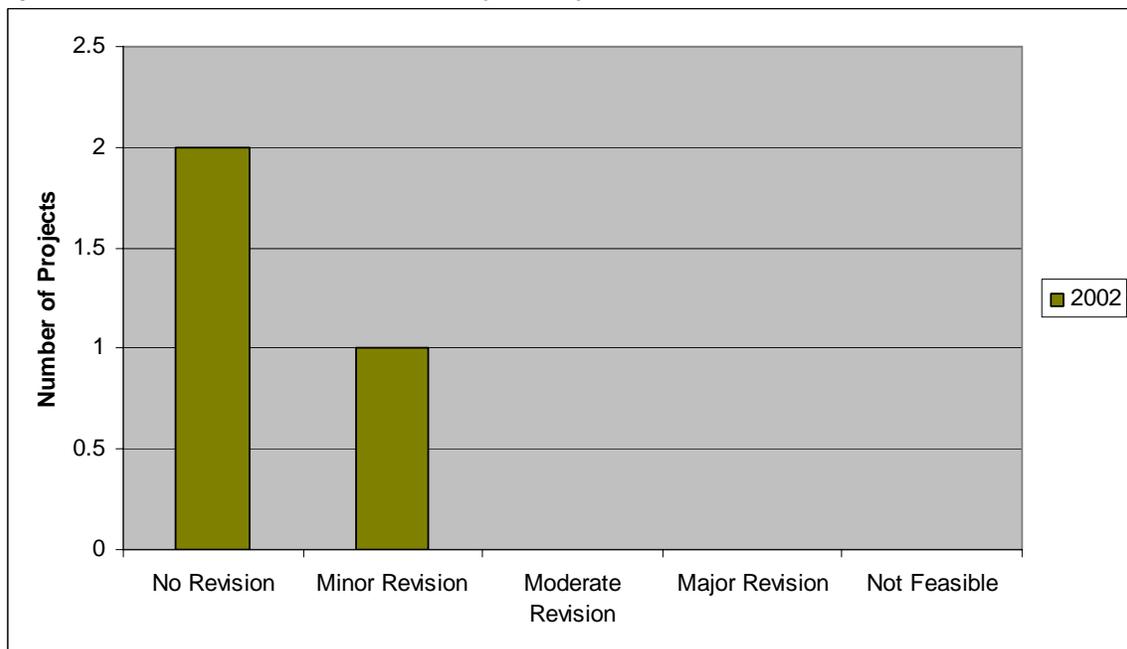


Figure 5. Final Scores for the First (2002) Cycle Methyl Bromide Alternatives Panels

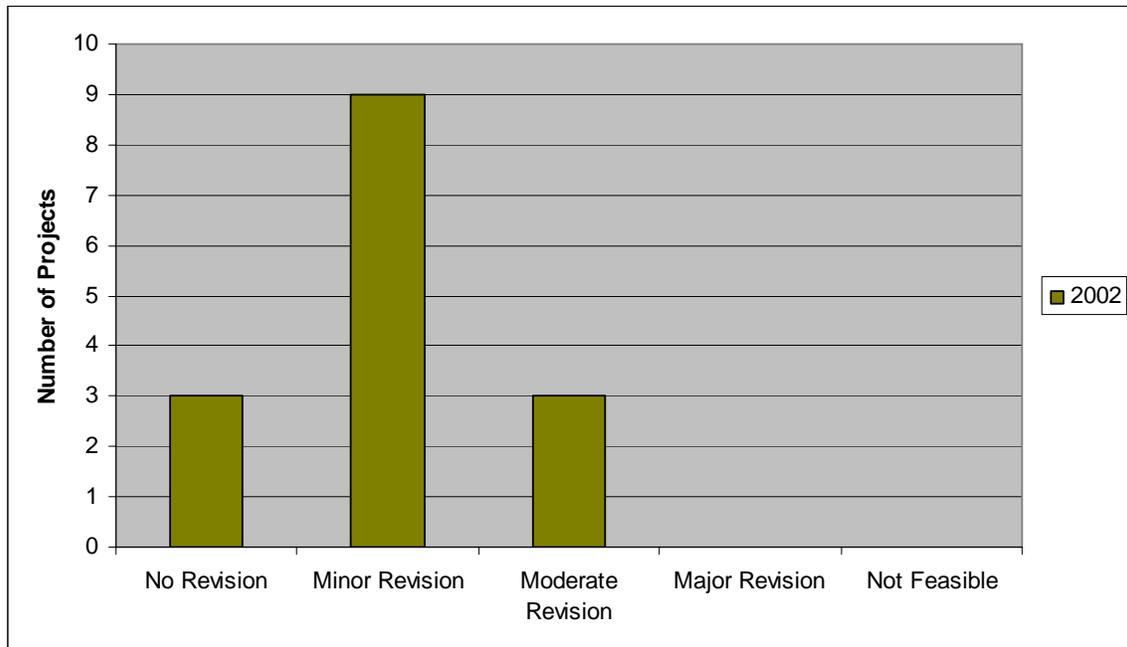


Figure 6. Initial Scores for the Second (2007) Cycle Methyl Bromide Alternatives Panels

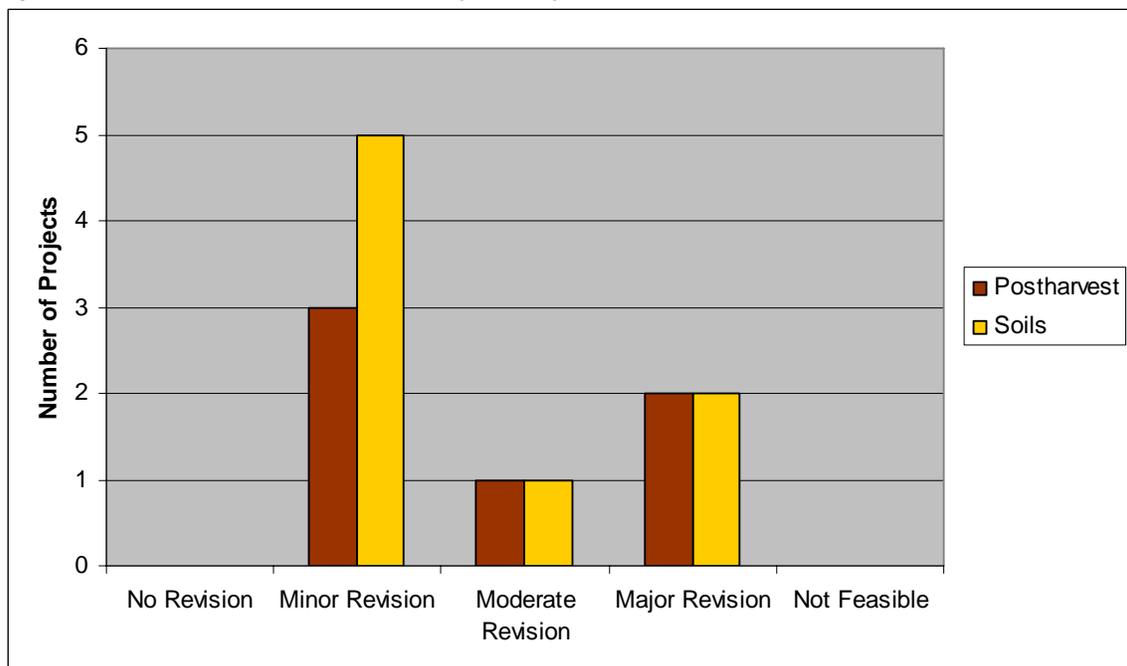


Figure 7. Re-Review Scores for the Second (2007) Cycle Methyl Bromide Alternatives Panels

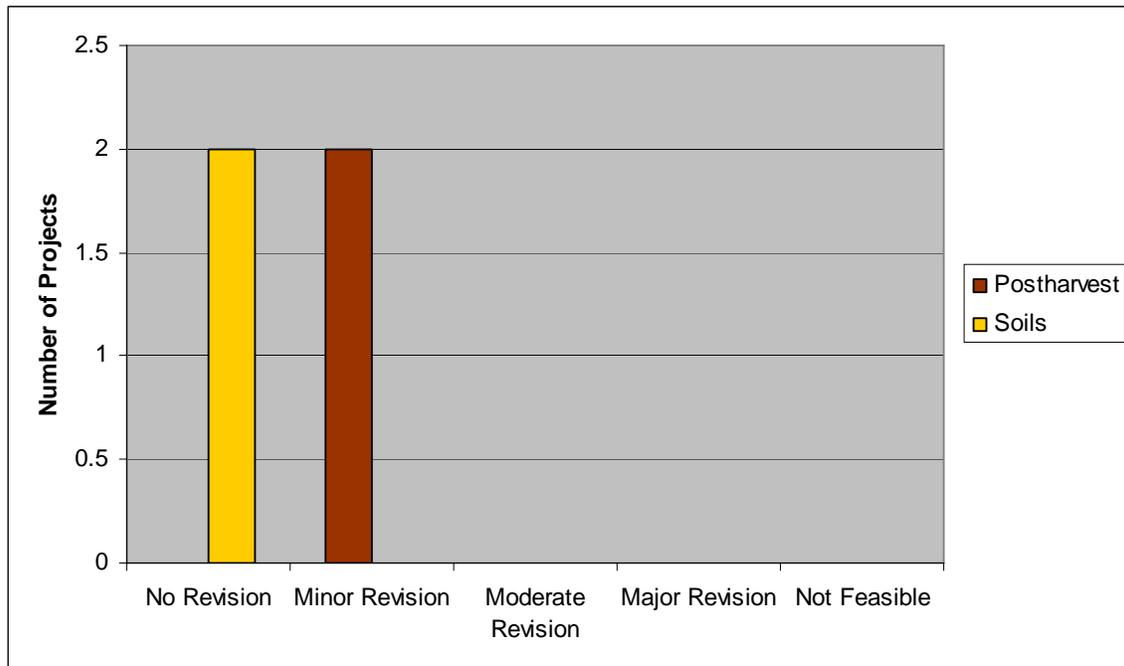
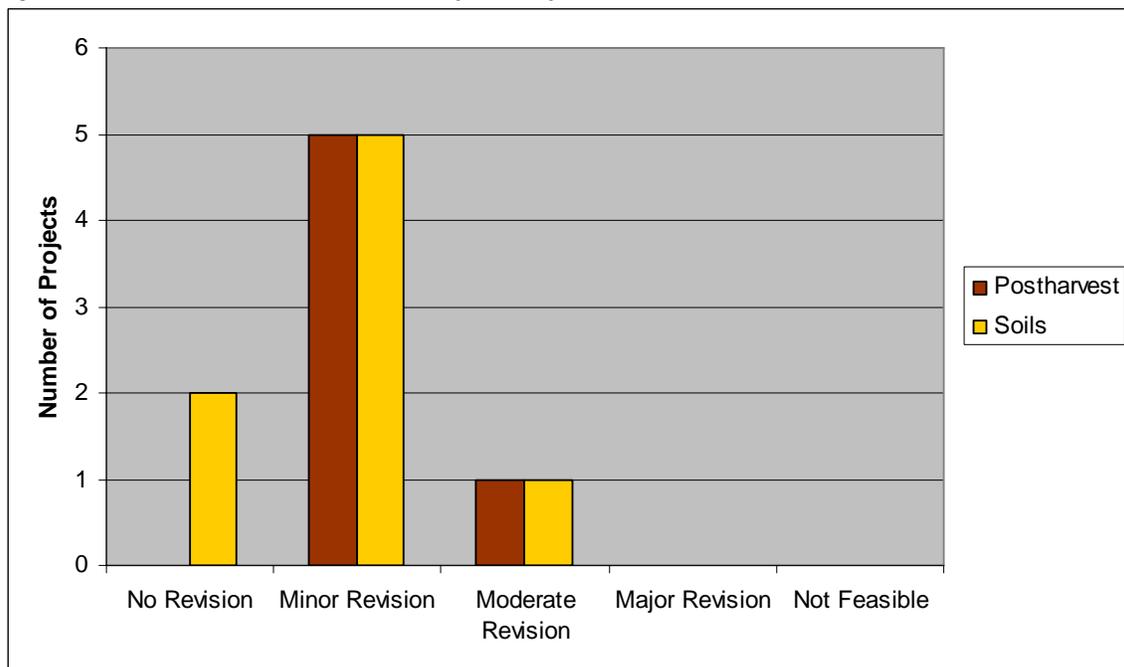


Figure 8. Final Scores for the Second (2007) Cycle Methyl Bromide Alternatives Panels



Panel Characteristics

ARS places responsibility for panel member selection primarily on external and independent panel chairs. ARS scientists, managers, and National Program Staff may recommend panelists, but the panel chair is under no obligation to use these recommendations. Several factors such as qualification, diversity and availability, play a role in who is selected for an ARS peer review panel. The two panels were composed of nationally and internationally recognized experts to review 14 projects primarily coded to the Methyl Bromide Alternatives National Program (See Table 1, page 2). The information and charts below provide key characteristics of the Methyl Bromide Alternatives Panels. This information should be read in conjunction with the Panel Chair Statements.

Affiliations

Peer reviewers are affiliated with several types of institutions, especially universities, government, special interest groups, and industry. In some cases, peer reviewers have recently retired, but are active as consultants, scientific editorial board members, and are members of professional societies. Also, several government-employed panelists are recognized for both their government affiliation and faculty ranking. Tables 2 and 3 below show the type of institutions with which the Methyl Bromide Alternatives Panel members were affiliated with at the time of the review.

Table 2. Faculty Rank of Panelists Affiliated with Universities

| Panel | Professor | Associate Professor | Assistant Professor |
|-------------|-----------|---------------------|---------------------|
| Postharvest | 1 | 1 | |
| Soils | 2* | 2 | 1 |

*Extension Specialist.

Table 3. Other Affiliations Represented on the Panels

| Panel | Government | Industry & Industry Organizations | Other |
|-------------|------------|-----------------------------------|-------|
| Postharvest | | 2 | |
| Soils | 1 | 1 | |

Accomplishments

The peer review process is intended to be rigorous and objective, striving for the highest possible scientific credibility. In general, panelists are expected to hold a PhD unless the norm for their discipline tends to not require a doctorate level education to achieve the highest recognition and qualification (e.g., engineers and modeling specialists). Panelists are also judged by their most recent professional accomplishments (e.g., awards and publications completed in the last five years). Finally, the panelists who are currently performing or leading research to address a problem similar to those addressed in the National Program are preferred. Table 4 below describes their characteristics in the Methyl Bromide Alternatives Panels.

Table 4. The Panels' Recent Accomplishments

| Panel | Published Articles Recently | Received Recent Professional Awards | Having Review Experience | Currently Performing Research |
|-------------|-----------------------------|-------------------------------------|--------------------------|-------------------------------|
| Postharvest | 4 | 2 | 4 | 3 |
| Soils | 7 | 4 | 7 | 7 |

Personal Characteristics

The SQR Officer approves panel membership for the purpose of eliminating a conflict of interest or in fulfilling the Agency's obligation to create panels with a diverse membership (Departmental Regulation 1032-2 Diversity in Task Force and Committee Assignments). OSQR considers the distribution of race, nationality, sex, physical abilities, age, and duty station (by region) as primary determinants in creating a diverse panel. See Table 5 to better understand the diversity of the Panels' personal characteristics.

Table 5. The Panels' Personal Characteristics

| Panel | American Minority | Foreign | Females | Other Significant Comments |
|-------------|-------------------|---------|---------|---|
| Postharvest | | 1 | | Panelists work in three ARS Administrative Areas. |
| Soils | | 1 | 1 | Panelists work in four ARS Administrative Areas. |

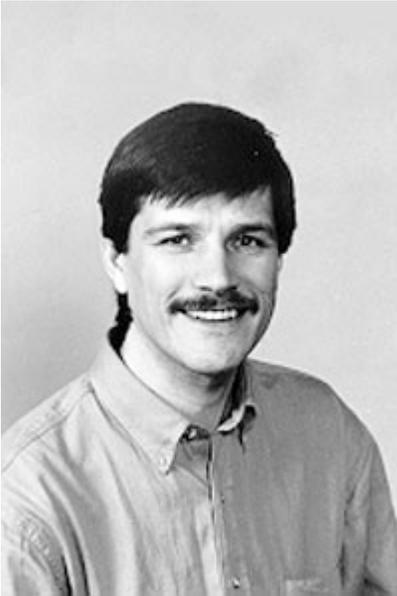
Current and Previous ARS Employment

The Research Title of the 1998 Farm Bill PL105-185, mandated ARS's requirements for the peer review of ARS research projects: 1) panel peer reviews of each research project were mandated at least once every five years and 2) the majority of peer reviewers must be external (non-ARS) scientists. Table 6 shows that the ARS does not currently employ any of the Methyl Bromide Alternatives Panel Reviewers.

Table 6. Affiliations with ARS

| Panel | Currently Employed by ARS | Formerly Employed by ARS |
|-------------|---------------------------|--------------------------|
| Postharvest | | 1 |
| Soils | | 2 |

Methyl Bromide Alternatives Panel Chairs



Frank J. Louws, Ph.D., ARS Panel Chair

Soils Panel

Assistant Professor and Extension Specialist,
Department of Plant Pathology, North Carolina
State University, Raleigh, NC

Education: Ph.D. Michigan State University; M.S.
and B.S. University of Guelph, Canada

Dr. Louws' research activities include developing
extension and research programs that emphasize
IPM and sustainable agricultural principles and
practices for the small fruit and vegetable
agricultural sector.



Dirk E. Maier, Ph.D., ARS Panel Chair

Postharvest Panel

Education: Ph.D.; M.S.; B.S. Michigan State
University

Dr. Maier's research focuses on post-harvesting
engineering and value-added processing of
agricultural crops and biological products.

Panel Chair Statements

All Panel Chairs are required to turn in a statement that describes how their panel was conducted and possibly provide comments on the review process that might not otherwise be found in the individual research project plan peer reviews. Panel Chairs are given some guidelines for writing their statements, but are nevertheless free to discuss what they believe is most important for broad audiences.

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Dr. Frank J. Louws
Associate Professor
frank_louws@ncsu.edu

September 18, 2007

Dr. Thomas (Ed) Cleveland
Scientific Quality Review Officer
Agricultural Research Service, USDA
5601 Sunnyside Avenue, MS5142
Beltsville, MD 20705

Dear Ed,

Thank you for the opportunity to serve as Panel Manager for the NP 308 panel review on "Methyl Bromide Alternatives: Soils Panel Review (2007)". It was a very productive time and we had a strong panel for the review process.

I feel that the panel was well constructed. Expertise included extensive industry experience combined with in depth knowledge of environmental fate (emissions) and movement of fumigants in soils, horticultural/crop production expertise, biofumigation expertise, weed science expertise, experience with large scale fumigation trials with alternatives and VIF, MBTOC expertise (and associated knowledge of international alternatives programs), molecular expertise (in microbial ecology, pathogen diversity/diagnostics, and gene expression), in-depth microbial ecology and biological control/suppressive soils experience, plant pathology, and a wide range of experience in horticultural production systems. I also included people intimately familiar with the methyl bromide alternatives program and a couple of people who offered an "outside" view. The panel was not strong in the areas of nematology and ornamental production systems but this was not an issue.

The panel members interacted well; there was even some healthy tension between long-term views that supported high risk and biological-based systems vs. shorter-term views that favored chemical-based alternatives. Overall the panel had the greatest appreciation for projects that had a balance of short-term, medium-term and long-term (identifiable or potential) products and outcomes.

The combined expertise and interaction of the panel combined to offer a very sound and credible scientific peer review. There were no serious cases where the panel felt poorly qualified to credibly comprehend, discuss, and offer an opinion or recommendation on the multitude of components associated with the various project plans. The panel understood the scientific quality review process and genuinely sought to offer positive criticism and creative suggestions when appropriate, to enable project plans to be improved. We trust this sentiment will be clear in the specific reviews of each project.

All panel members were well prepared and considerable input was offered, not only by the primary and secondary reviewers, but by each panel member. They all read all the proposals to my knowledge. Each primary reviewer did a good job leading the discussions and assembling a consensus review. There was a clear understanding of the process and scoring matrix. One panel member left the room for an identified COI.

Overall, the project plans were of high quality. The NP308 program is an important identifiable program that is important for ARS and its customers given the current dynamics of MB availability and current status of alternative systems. The project plans represented a wide range of objectives and initiatives that are critical for the short, medium and long-term development and implementation of alternative pest management practices. In general, the panel was highly complementary of the historical and anticipated productivity of the overall program.

Several comments or concerns arose during our discussions, in order from minor to substantial. It was noted that one particular collaborator was identified as a collaborator in many of the proposals. Clearly this collaborator cannot be a full cooperater in all the proposals. Are PIs expected to identify collaborations and if so is it clear what a collaborator is (one who offers substantial input)?

Many of the pathosystems need better host resistance as a control tactic. Why do the proposals seem to keep distant from breeding objectives? We are familiar with some projects outside NP308 such as peppers, but there is a real need for advanced and publicly funded breeding work in e.g. strawberries and tomatoes.

Some of the projects/objectives lacked a clear appreciation or link to methyl bromide alternatives. This was not so much an issue in some of the longer term, higher risk areas (such as biological control projects where this expectation is not immediately relevant) but in shorter term projects where appropriate methyl bromide controls and/or the best industry standard were not sufficiently included, understood or articulated. It is important that projects and PIs make themselves aware of the reality of MBTOC expectations (to have MB comparative data) and current industry practices as "positive" controls. This suggests a need for stronger links with extension, growers or other relevant customers. In contrast, other project plans have an outstanding sense of the MB alternatives context and had appropriate controls and vision. We included a uniform statement in all proposals to remind PIs that a MB or an industry standard should be included in all relevant experiments as a positive control.

During this review process it was noted the Methyl Bromide Alternatives National Program #308 (pre-plant fumigation component) included a mix of fumigant emissions-reduction and biocontrol/alternatives projects. Of these two categories, emissions-reduction projects are time-critical to customers for preserving the use of currently registered fumigants while biological or other control alternatives mature. Available CUN exemptions for MeBr have a shortening timeline due to the international nature of the decision process. Therefore without immediate increased support for emissions-reduction of MeBr alternatives, there may be a gap of products available to customers nationally and more so in certain states. An articulated question arose: Can program leadership provide sufficient resources in the near-term to support emissions reduction problems. This may require, not reassignment of biocontrol/alternatives scientist

years, but increased staffing and support for maintaining the registered fumigants. Further, ARS scientists need NP Leader direction to proactively advocate sound science with USEPA and state regulatory personnel at all levels (scientist to director levels). It is productive to ensure the in-depth research generated is available and communicated for decision-making at the regulatory level. Likewise ARS scientists need a clear view of environmental/health registration issues associated with the chemical fumigants for their own programs since the registration process is a moving target. Therefore ARS project plans need to be flexible.

No project offered effective economic components linked to work on alternatives. All CSREES projects within the competitive grants program must articulate an economic objective and MBTOC appears to be shifting toward "economic" feasibility criteria as opposed to "technical" feasibility criteria as they consider Critical Use Nominations. There was an urgent sense that many projects could easily include even a basic economic component that would be exceptionally valuable to all ARS customers. We included a uniform statement in all proposals to highlight the need for economic data when appropriate.

The panel had a couple of very hard projects to evaluate due to substantive concerns about the merit & significance, approach & procedures, and/or probability of success. Clearly, the PIs in these projects had a distinctive expertise and in most cases, a commendable scientific track record. However, either they are "mis-assigned" or found it difficult to modulate their expertise to fit within the NP308 objectives. Thus, two project plans had major revisions required. There is a balance to allow PIs freedom to document their own objectives but there also is wisdom to have mechanisms to mentor/guide PIs to avoid a scientific panel decision for "Major Revision". I cannot advise about the balance within the ARS framework. Some people have great flexibility to adapt and others have a great expertise not easily adapted (due to structural issues or personality traits). It would be a shame to discourage a very capable scientist because they are a "square peg trying to be fitted into a round hole". On the other hand, if ARS feels sufficient checks and balances are in place, then this OSQR panel has fulfilled a valuable task to prevent the implementation of project work plans that do not meet peer review criteria. In this case, it is our privilege to re-review the projects with expectations that the process will greatly enhance the quality of the project plans.

In summary, the OSQR panel was composed of members with appropriate expertise capable of offering a fair and valuable peer review of all the project plans submitted. The peer review process went smoothly with equitable time allocated to each plan. The panel had a positive outlook and sought to offer helpful comments and recommendations. Overall, this was an effective peer review panel evaluating a high quality program.

Thanks for the opportunity to participate in this process.

Sincerely,



Frank Louws
Panel Manager NP308 2007.

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February 4, 2008

Dr. Thomas (Ed) Cleveland
Scientific Quality Review Officer
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Beltsville, MD 20705

Dear Ed,

I wanted to follow-up on my Panel Summary provided to you on 9/18/2007 based on the panel's follow-up review of the two project plans that did not meet criteria in the first round.

The panel was able to thoroughly review the re-submissions through web-conferencing. First, both reviews came back with superior changes, or well-articulated rebuttals, to enable the panel members to unanimously vote "No Revision Required". The panel was highly pleased at the quality and thoroughness of the revised project plans.

Second, the outcome of the second reviews demonstrated the value of the OSQR process. The panel identified major concerns in the first round, the authors responded in a highly respectful and thorough manner and the outcome was superior project plans that should serve the authors, ARS and the public-good well.

Finally, the panel found the web/telephone conferencing method very efficient and effectual to manage the second round of reviews.

In summary, I believe each panel member enjoyed this opportunity and you and your office provided excellent support for making the process work smoothly and effectively. Thanks also for all your help to me as a Panel Manager. The level of support provided by your office enabled us to focus on the science and review without the added concern of managing the mechanics of the process. Please extend my gratitude to Linda Daly-Lucas and Ed Cleveland for their guidance and help in managing this Panel. They were a delight to work with.

Thanks again for the opportunity to participate in this process.

Sincerely,

Frank Louws
Panel Manager NP308 2007.

February 11, 2008

Thomas E. Cleveland, PhD, Scientific Quality Review Officer
Office of Scientific Quality Review
Agricultural Research Service, USDA
5601 Sunnyside Avenue, MS 5142
Beltsville, MD 20705

1. Did the USDA NP 308 Methyl Bromide Alternatives: Postharvest Panel have discussions that reflected a sound and credible scientific peer review:

Yes, this panel conducted a sound and credible scientific peer review of six plans during a two-day panel meeting in Washington, DC September 18-19, 2007. Prior to the panel meeting thoroughly written reviews were submitted by each panel member and were shared among the panelists ahead of the meeting. It was obvious that each panel member came prepared to the meeting having read each plan and review. The panel members took their peer review responsibility seriously. Discussion reflected creative thinking and numerous ideas and alternative approaches that may not have been considered by Agency scientists and staff were suggested and summarized in the final written panel review.

2. What were the most notable (positive or negative) characteristics of the discussion process and why:

As panel chair I was pleased with the level of preparation of each panel member in terms of having provided thorough written reviews in advance of the meeting and coming prepared for the discussion of each plan. Although different plans took different amounts of time for discussion, all plans were thoroughly discussed and all panel members remained engaged in the discussion of each plan. Discussion of all six plans was completed during the first day (approximately three between 9a to noon, and three between 1p to 430p) with the primary reviewer of a plan assigned to take notes of the discussion. The primary reviewers completed their summaries that evening in preparation for review and final revision of these summaries during the morning of the second day. At no time was there any conflict among panel members. As a matter of fact, their concerns with regard to certain plans were similar and so were their recommendations for the level of revisions needed. They worked together in professional and complementary manner, which resulted in reviews that were helpful to the lead scientists and their teams.



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Panel members did not have problems understanding the review criteria and their roles as peer reviewers. Additionally, the scoring and critique writing procedures were explained well by OSQR beforehand and thus the panel members did not have difficulties completing their assignment properly and timely.

No conflict of interest existed among members of the panel during the first review. However, due to the revisions made in one plan as a result of panel recommendations, one conflict of interest emerged during the re-review process, which resulted in the exclusion of one peer reviewer.

The logistical arrangements were excellent and so was the support provided by the OSQR staff. Timeliness of information provided was greatly appreciated by the panel members. No improvements can be suggested.

3. What suggestions do you have to improve the peer review process?

The panel members believe that their peer review of these plans was taken seriously by OSQR and Agency scientists. This was reflected in the thoroughness with which the lead scientists and their teams responded to the recommended revisions in the two plans that required major revisions. Thus, this panel has no suggestions as to how to improve the peer review process further.

4. Overall, was this an effective peer review panel?

As panel chair I was pleased with the professionalism of the members of this peer review panel, which resulted in an effective peer review.

A handwritten signature in cursive script that reads "Dirk E. Maier".

Dirk E. Maier, Ph.D., P.E.
University Faculty Scholar
Professor, Associate Head &
Extension Agricultural Engineer



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Projects Reviewed by the Methyl Bromide Alternatives Panels

Beltsville Area

Dilip Lakshman

Biologically Based Management Strategies for Control of Soil-Borne Pathogens of Ornamental Crops as an Alternative to Methyl Bromide Pre-Plant Soil Fumigation

Daniel Roberts

Integration of Biologically Based Technologies for Suppression of Soilborne Plant Pathogens

Northern Plains Area

James Campbell

Alternatives to Methyl Bromide Fumigation for Control of Insects in Postharvest Structures

Pacific West Area

Judy Johnson

Non-Chemical Solutions for Controlling Pests and Maintaining Quality in Postharvest Commodities

James Leesch

New Chemically Based Methods and Methods Which Reduce the Use or Emissions of Chemicals as Alternatives to Methyl Bromide for Quarantine and Postharvest Pests

Yong-Biao Liu

Postharvest Pest Control on Perishable Agricultural Commodities Using Controlled Atmospheres and Pure Phosphine Treatments

Frank Martin

Management and Molecular Detection of Pathogens in Strawberry and Vegetable Production Systems

Mark Mazzola

Biologically-Based Systems for Soilborne Disease Control in Tree Fruit Agro-Ecosystems

Dong Wang

Alternatives to Methyl Bromide for California Cropping Systems

South Atlantic Area

Leon Allen, Jr.

Enhancing Dispersion of Low Vapor Pressure Fumigants in Soil and Reducing Emissions to the Atmosphere for Improved Efficacy and Environmental Protection

Michael Bausher

Vegetable Grafting for Resistance to Soilborne Diseases

Daniel Chellemi

Alternatives to Methyl Bromide Soil Fumigation for Vegetable and Floriculture Production

Nancy Epsky

Protection of Subtropical and Tropical Agriculture Commodities and Ornamentals from Exotic Insects

Southern Plains Area

Robert Mangan

Development of Quarantine Alternatives for Subtropical Fruit and Vegetable Pests

Office of Scientific Quality Review

The Office of Scientific Quality Review (OSQR) manages and implements the ARS peer review system for research projects, including peer review policies, processes and procedures. OSQR centrally coordinates and conducts panel peer reviews for project plans within ARS' National Programs every five years.

OSQR sets the schedule of National Program review sessions. The OSQR Team is responsible for:

- Panel organization and composition (number of panels and the scientific disciplines needed)
- Distribution of project plans
- Reviewer instruction and panel orientation
- The distribution of review results in ARS
- Notification to panelists of the Agency response to review recommendations
- *Ad hoc* or re-reviews of project plans

Contact

Send all questions or comments about this Report to:

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