PROCEEDINGS OF EPA PUBLIC WORKSHOP
PLANT-INCORPORATED PROTECTANT EXPERIMENTAL USE PERMIT: PROCESS AND COMPLIANCE

Crystal City Hilton, Arlington, Virginia

February 10 and 11, 2004

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EXECUTIVE SUMMARY

During 2001 and 2002, field oversight activities conducted by the United States Environmental Protection Agency (EPA) revealed issues of concern associated with Plant-Incorporated Protectant (PIP) experimental activities. In addition to the information yielded by EPA enforcement activities, dialogue with the biotech industry and with public interest organizations confirmed that concerns existed both within and outside of the agency about the consistency, adequacy and efficacy of EPA's regulatory program for PIP Experimental Use Permits (EUPs).

In order to attend as swiftly as possible to these concerns, EPA decided to sponsor a workshop with broad public participation and input to identify best approaches to regulatory improvements pertaining to PIP EUPs. The workshop, entitled PLANT-INCORPORATED PROTECTANT EXPERIMENTAL USE PERMIT: PROCESS AND COMPLIANCE, was held at the Crystal City Hilton in Arlington, Virginia on February 10 and 11, 2004.

The workshop was designed to be a working meeting with participation from industry, public interest, agricultural/agronomic and academic communities. The goals of the workshop were to ensure that:

- PIP Experimental Use Permitees' goals are addressed by the EUP process;
- PIP EUP field obligations, Agency requirements, and the pathway to compliance are clear;
- the Agency's environmental and human health mission is fulfilled.

The workshop was structured with substantive break-out sessions to encourage participants to work collaboratively and to develop concrete suggestions on how to improve the PIP EUP process. The program emphasized listening to different perspectives in an effort to fully hear all of the points of view of the represented communities. EPA believes that this gathering of perspectives is important to inform Agency decision-making on these important regulatory issues. The workshop agenda also included three final panel discussions that were intended to extend the listening and learning of the group and to encourage participants to consider the relationship between the PIP EUP topics and associated issues.

The focal program of the workshop divided the topic according to four sub-themes:

1. EUP application, submission, and review process; data requirements
2. Regulatory terminology; definitions and clear language
3. Containment and confinement; standards, and strategies to achieve
4. Ensuring that PIP EUPs are conducted according to permit conditions

After a morning of introductory sessions, participants were divided into four groups and considered, in sequence, each of the four theme areas. Specifically, they were asked to comprehensively identify the issues associated with each thematic category. During the next phase of the workshop, participants chose two of the four areas and worked together to identify possible approaches to addressing the previously identified issues.

The workshop participants prioritized a number of issues and recommended approaches, including:

<u>EUP Application, Submission and Review</u>

EPA should develop comprehensive data requirements for PIPs that would address EUP requirements. The data requirements should be developed with stakeholder input, and harmonize with USDA and other agencies where appropriate. Data requirements should consider ecological concerns including endangered species.

Recommendations were made to streamline the submission process both by providing definitive legal and regulatory interpretations earlier in the process and also by using electronic submissions where possible, and standardizing formats. Interagency coordination, alignment and communication were identified as common stakeholder priorities.

Regulatory Terminology

Timely clarification of regulatory terminology pertaining to PIP EUPs is of utmost importance to stakeholders, and was articulated as a priority within this session and all of the others as well. Vagueness in regulatory terminology can easily (and has) led to non-compliance and potential risk. Workshop participants identified a fairly exhaustive list of terms in need of definition or clarification. Participants also identified harmonization of terminology as a high priority, both between EPA and USDA terminology, and among other agencies and authoritative bodies, domestic and international. It was also noted that terminology should align with generally accepted agronomic terms and understanding. Advantages and disadvantages of approaches—regulation, policy, guidance, defining within permits—were considered. Generally, regulation is regarded as most robust and legally reliable, but slowest to achieve. Defining within permits is similarly clear, but redundant and inefficient. Policy and guidance is efficient, but more subject to variable interpretation.

Containment and Confinement

Priorities identified in this category included clarification of definitions, and particularly the importance of coherent relationship between EPA and USDA terminology, in light of jurisdictional overlap. Establishing containment standards, identifying and addressing adverse effects from containment failure including below 10-acre plots, and using biological and geographic containment strategies and monitoring to increase effectiveness and confidence were all identified as priority issues. In addition, the states' roles with regard to containment and confinement were highlighted, as was containment as a feature in public confidence about food safety.

Ensuring that PIP EUPs are conducted according to permit conditions; Compliance

During discussion of compliance-related issues, there was considerable focus on the role of states, and the differences between conventional pesticide regulation and that of PIP EUPs. Needs in procedures, tools, and training were identified both from the regulatory and industry perspectives, and even engendered some consideration of collaborative training development. As in two other sessions, endangered species considerations was raised as a concern, representing (in addition to the specific issue) the necessity of considering jurisdictional relationship with other statutes and authorities. Lastly, the interface of compliance and public information was identified as a challenge, as much data is protected as Confidential Business Information, which can challenge State processes and public confidence.

The workshop was evaluated as highly worthwhile by participants of many perspectives, several characterizing it as more productive than any government meeting they had ever attended. Most participants recognized the workshop as a beginning step on the part of EPA to addressing concrete issues with PIP EUPs and eagerly anticipate the longer-term outcomes of Agency reforms and decisions.

WORKSHOP PROGRAM - DAY ONE

WELCOME, BACKGROUND AND SCOPE OF WORKSHOP

Karen Heisler (EPA Region 9)

I want to welcome everyone, and thank you in advance for your active participation in this workshop.

This workshop has come together with support and help from a number of people. Thank you to the EPA workgroup that has been so committed to developing what I think will be a good program, and special thanks to our 'consultants' (some of whom are not able to join us due to scheduling conflicts) who offered us valuable perspectives about how to make this most meaningful for all audiences who are here today.

This workshop came about largely because many of us have become enlightened of late about parts of the EUP (Experimental Use Permit) program that need our attention—a lack of regulatory clarity or misinterpretations can lead to noncompliance and/or environmental or human health risk. It's in our collective interest to ensure that the program is fully effective.

EPA's recognition of this need to revisit the PIP EUP (Plant-Incorporated Protectant Experimental Use Permit) program was significantly stimulated by some oversight work that the Region 9 office did in Hawaii in the last couple of years. That's also why we have been sharing the effort of organizing this workshop with the national program office.

A little bit about the program: Many people have remarked on the form of this workshop. We aren't kidding when we say we want it to be participatory. We feel that this will produce the most thoughtful problem solving. If you look at your agenda, you'll see that we will spend the first part of today on background, both in a big picture way—what is the purpose of the research that happens under EUPs—as well as a nuts-and-bolts review of how the EPA EUP program functions. This, we hope, will get us on the same page for the core of the workshop, which is really a collaborative exercise.

This afternoon and tomorrow, we will work in four smaller groups. The task this afternoon will be to identify and prioritize—but not solve—all the issues related to the EUP program that we think need to be addressed. Tomorrow, after a night of rest and the kind of inspiration that comes from sleeping on something—my parents always told me when I was fretful about not being able to solve something, "Just sleep on it…"—we will work on approaches and recommendations on each of the issues.

We hope the outcome of this process will be a rather exhaustive list of PIP EUP issues to address, accompanied by a thoughtful array of approaches and recommendations to the Agency. We also hope that this workshop will offer an experience of respectful exchange. We want to encourage people to listen patiently to one another, to resist the impulse to shut out perspectives with which we differ, or that seem to challenge ours. Rather, we are encouraging a welcoming of differing perspectives, an opportunity to share expertise and a willingness to find common ground where it exists, especially around the common interest in an effective EUP program.

As a reward, we will finish the workshop with a series of three panel discussions designed not to problem-solve—like the first part of the workshop—but really to explore some of the meaningful, relevant issues to this program—coordination with USDA (United States Department of Agriculture), how we work with private and public information and compliance.

I want to take a moment to acknowledge that you may have issues outside of the scope of the EUP program that you would like to raise. We are always interested in public input, and we want to ask everybody to try to keep in mind the focus of the workshop. Clearly, if this were a workshop about all aspects of biotech regulation, we would have had to make it longer than two days. We hope you can help us stay on task, and the folks who have volunteered to be facilitators will help us with this. Some points may be brought up that aren't so germane to the problem-solving exercises but can be channeled to tomorrow afternoon's discussions. You might want to carry a notepad with you to be certain to capture those thoughts that need to be addressed later.

With that, I'd like to introduce the Principal Deputy Assistant Administrator for the Office of Prevention, Pesticides and Toxic Substances (OPPTS), Susan B. Hazen. Susan was the Deputy Office Director in the Office of Pesticide Programs during most of the reassessment of *Bacillus thurengiensis* (Bt) crops done in 2000 and 2001. She has sustained her interest and participation in biotechnology both domestically and internationally. We are very pleased Susan has taken time out of her busy schedule to kick-off this workshop.

SUSAN HAZEN (EPA OPPTS)
Thank you very much for that introduction. If enthusiasm is catching, you clearly had people's attention. If we hold this enthusiasm for the next few days, this will be a success, no matter how in-depth we get.

Karen is core to this program. My first post was not plant pesticides, it was TSCA. When I first came over to the pesticide programs, I knew nothing. Janet Anderson was my mentor as biotechnology was just heating up. We dealt with the reassessment of our program to respond to the issues raised by Starlink corn. Now, the whole biotechology area is of great interest to me. That's one of the reasons I wanted to be here today. This is such a promising area. We want to make the right decisions and do the right things, and do right internationally. We extend a welcome to all of you. This is a larger crowd than we anticipated. My understanding is there are representatives from the environmental community, the academic community, the press, and colleagues in the regional offices and state governments. There will be a number of lively panel discussions. Some of the best and brightest are on the panels to engage us. And if anybody can keep group this large group engaged, it is Ann Sorensen. I would like to thank Karen and Janet and her people for pulling this together.

The common goal of EUPs for PIPs is to assure the best possible structure is in place to allow experimentation to happen and allow information and science to emerge and do so in a way to make sure it is safe. "Safe" means many things to many people. We want to do EUPs in a way that industry, farmers and growers do not have unintended consequences. We want the public to be assured that things are kept in check before approval. We all know why this is critical. At an Organization for Economic Cooperation & Development (OECD) meeting I recently attended, they dealt with conventional chemicals. On the edges of these meetings there were discussions of biotechnology. My colleagues from other countries asked me about EUPs and what we are doing. How do we manage and coordinate? Is there a regulatory structure in place? What is the level of quality? We look across all agencies with expectation that a quality system is in place. I think today and over the next few days there will be the opportunity to take a critical and objective look, taking off our job hats and bringing knowledge and intelligence to what we do. The question is how do we assure the system will work? At the end of the day, EUPs should provide a structure that the American public can have faith in and that keeps our food supply safe. We need to put our heads together to consider how we put in place a system that provides this to all Americans.

Three main agencies—EPA, USDA and Food and Drug Administration (FDA)—coordinate how we look at genetically engineered organisms. The differences in statutes bring us to the meeting with experience and knowledge of what works and doesn't work. The biotechnology program can be sustainable and workable and assure the public safety that they can count on. I can't be here for the whole conference, and I have my own thoughts. We need to see how we put them in place. Work hard and I am hopeful that what comes out will be something that we all can get behind.

ANN SORENSEN (AMERICAN FARMLAND TRUST)
I direct the research center for American Farmland Trust, called the Center for Agriculture in the Environment. We're based at Northern Illinois University in DeKalb, Illinois. I will be facilitating the panel discussions and my staff will be taking notes over next few days. We'll capture as much as possible what goes on at this meeting to surface the best ideas and suggestions. My organization is a Washington, D.C. based nonprofit dedicated to saving productive farmland and encouraging healthy farming practices. We are neutral on this issue, which is one of the reasons we're helping EPA with this meeting. We also work with EPA to encourage the widespread use of Integrated Pest Management. Echoing Karen, I encourage you to follow meeting decorum and contribute as much as possible.

PANEL SESSION: GOALS RELATED TO ACTIVITIES UNDER EUP

The first panel of speakers represented stakeholders from EPA, USDA, industry, academia and the public interest for the purpose of discussing their goals and mandates with regard to biotechnology research conducted under experimental use permits. The session illuminated commonalities and differences between the panel members.

EUP GOALS AND MANDATES PANEL

Janet Andersen (EPA Office of Pesticide Programs Biopesticides and Pollution Prevention Division (OPP BPPD))

Good morning. I'm Director of Biopesticides within the Office of Pesticide Programs. I also want to extend the comments of others in welcoming you to this PIP EUP workshop. I really appreciate your attendance and the contributions you will make over the next two days.

First, let me provide a little bit of background to set the stage. This first panel of the workshop gives an opportunity for several stakeholders—EPA, USDA, industry, academics and public interest—to provide their perspectives on the goals for EUPs and field trials. We will be using this general format often in this workshop in order to hear from different groups and gather different ideas.

I would like to thank the panel members for this session: Susan Koehler from USDA, Animal and Plant Health Inspection Service (APHIS); Russ Schneider from Monsanto Company; Doug Gurian-Sherman representing the public interest sector; and LaRessa Wolfenbarger representing the academic perspective.

EUPs are intended to allow researchers or companies to field test new varieties to produce data that will support an application for a commercial license to sell the product —that is a registration.

EUP's mandate for approving such EUPs is broad—to protect human health and the environment —but one of the goals within this mandate for EUPs is to provide enough flexibility so researchers can experiment and find out what will work for a new product. For example with a PIP EUP, EPA allows several similar, but slightly different genetic constructs or events to be included in one EUP so they can be compared under field conditions. Some of these will move forward towards registration and others won't.

Under Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), regulations require approval of an EUP once field testing is at 10 acres or more cumulative. Generally, USDA oversees tests less than 10 acres; however, EPA does have a role even under 10 acres if there is any possibility the PIP (or other unregistered pesticide) would end up in the food or feed supply. Then a temporary tolerance or exemption from tolerance is needed under Federal Food Drug and Cosmetic Act (FFDCA).

It is the responsibility of the researcher to make sure they are complying with the regulations.
EPA is glad to work with researchers, companies or anyone else to provide guidance on the EUP process and what may be needed to comply with the regulations. This is one of the reasons for this workshop as we are looking for your help to improve the clarity of what is required and to improve the process itself. You will hear more details from Mike Mendelsohn a bit later.

Note that this is a "green" workshop. We aren't using much paper. We've posted all of the background materials on the web and will have resource copies available for sessions later on in the day. We have provided some materials on the web already and these proceedings will also be available on the web.

We look forward to this being a very participatory workshop. And to that end, I want to provide plenty of time to the other panelists this morning, so I will turn this over to Susan Koehler from USDA's Animal and Plant Health Inspection Service.

GOALS AND MANDATES WITH REGARD TO BIOTECH RESEARCH CONDUCTED UNDER PERMITS
Susan Koehler (USDA Animal and Plant Health Inspection Service (APHIS))
I am a branch chief for USDA APHIS biotechnology regulatory services. We are charged with overseeing all regulations promulgated under Federal Plant Pest Act (FPPA) and Plant Quarantine Act (PQA). APHIS' mandate under the FPPA and PQA is to protect plant health both in the agricultural environment and the natural environment. This includes direct disease damage or injury to plants or their products or indirect effects on plants or their products such as through organisms beneficial to plants such as pollinators, symbiotic relations as with nitrogen fixing bacteria, beneficial predators etc.

The goal with regard to biotech research under APHIS authorizations is to conduct the trial in such a way that the regulated plants are confined to the test site, that they don't become inadvertently mixed with plant material not part of the release, their identity is maintained while in use, and the regulated plants or their offspring don't persist in the environment, thereby limiting long-term exposure and any potential effects to those plants at the test site and for the limited duration of the test. Consistent with the National Environmental Policy Act (NEPA) we must consider whether the release will have significant impacts on the human environment. Conditions can be placed on the test to mitigate effects or ensure appropriate levels of confinement.

Depending on the long-term goals for the plants being tested, applicants may collect specific types of data to support a petition for deregulation in order to proceed with unconfined releases as for commercial sale. These data include effects on nontarget organisms and disease and pest susceptibility as well as agronomic characteristics that may affect fitness, weediness or the interactions with nontarget organisms. Regardless of commercial plans, any adverse effects on plants, nontarget organisms or the environment that are observed must be reported to APHIS in field data reports. There are many different reasons for field tests, including purely environmental research. Unlike EPA with its 10-acre trigger, we regulate all field testing no matter what size.

Experimental Use Permits: Industry Goals
Russ Schneider (Monsanto)
[Power Point presentation]

Biotechnology Industry Goals for Experimental Use Permits

- BIO members firmly believe it is in the best interest of EPA, Registrants, and Stakeholders to strive for clarity of the requirements regarding EUPs for PIPs in order to ensure safety and consistent practice in the field.
- Clarifying EUP requirements for PIPs through appropriate guidance and rules will enable research, crop breeding, and product development to proceed without interruption and continue to provide new reduced risk pest control options to growers.

Experimental Use Permits for PIPs

- An EUP is required when field testing of an individual transformation event exceeds 10 acres per pest.

EUP Programs

- EUPs have been initiated under crop destruct provisions, as well as after EPA has granted exemptions from the requirement of a tolerance.

- In either case, information on history of safe use, bioinformatics, and digestive fate is available prior to a decision being made to field test.
- Likewise, prior to the EUP stage, field testing has occurred under the USDA permitting/notification process which requires extensive containment provisions.

EUP Containment

- Field test locations and practices are established to insure containment utilizing border rows, isolation distances, (meeting or exceeding those required by USDA and derived from the seed trade as required for seed purity) bagging, detasseling, or temporal isolation.

Figure 1: Isolation Distance (diagram)
Figure 2: Isolation Distance (photo)
Figure 3: Bagging as a controlled Pollination Technique
Figure 4: Mechanical Detassling (photo)
Figure 5: Fallow Ground (photo)

EUP Goals: Performance Evaluations

- Evaluate the performance of the product under various levels of insect pressure and environments
- Generate data to address the impact of a potential product on non-target organisms
- Generate sufficient quantities of the commodity to evaluate nutritional composition, and address market acceptance issues such as animal performance studies

EUP Goals: Performance Evaluations (cont'd)

- Determine yields in commercial scale trials
- Compare efficacy to existing pest control products
- Develop product characterization data for labeling and registration purposes
- Refine product benefits data
- Evaluate various IRM programs
- Develop breeding and observational nurseries
- Evaluate indirect benefits of potential products such as: lower mycotoxin levels, reduced damage from secondary insects, increased water use efficiency by the crop, and increased numbers of beneficial insects

EUPS: A QUESTION OF EXPOSURE
Doug Gurian-Sherman (Agricultural Biotechnology consultant)
[Power Point presentation]

EUPs: A Question of Exposure

- Identify the major risk factors from PIP EUPs: the importance of scale, exposure, fitness and gene flow
- Discuss what these risk factors imply for the regulation of EUPs, especially the need for *containment* or *confinement*
- Make recommendations for addressing major risk factors

Direct Risks From EUPs:
Implications of Scale

- The small scale of EUPs, both in duration and size, reduce exposure, and hence reduce *direct risks* compared to commercialized PIPs

- An exception is possible direct harm to endangered species: *PIPs should be isolated from potentially susceptible endangered species*
- The focus will be on *indirect risk factors*, especially gene flow and fitness

Indirect Risk Factors:
Gene Flow to Wild Crop Relatives and Crop Contamination
- Gene flow to wild relatives, or to non-PIP crops, may *amplify* exposure in space and time, subverting the premise of limited exposure from EUPs

Indirect Risks Factors:
Gene Flow to Non-PIP Crops
- Contamination of nearby food crops would constitute adulteration
- Contamination of fields used for seed-increase could lead to the spread of unregistered PIPs
- *Therefore, **containment** is needed to protect commercial and seed-increase fields*

Gene Flow to Wild Crop Relatives:
The Importance of Fitness
- Whether a PIP confers a *fitness advantage* to a wild relative or non-domesticated crop is the key for determining the spread and persistence of that gene
- *PIPs that confer increased fitness, even if they occur at initially low levels, have a good possibility of increasing in abundance*

Fitness and PIPs
- National Academy of Sciences (NAS) report on biological confinement: "Generally, if an allele confers a fitness advantage…it is expected to increase in frequency, *even if it is introduced only once*." [emphasis added]
- and... "It is possible that some engineered genes that confer pest resistance…might contribute to the evolution of increased weediness in wild relatives…"
- An escaped PIP may also harm non-target organisms

Determining Fitness: Catch-22
- Fitness cannot be predicted: for example, Bt
- wild-sunflower seems to have a fitness (fecundity) advantage, while GE white-mold-resistant wild sunflower may not
- Fitness depends on gene/organism/environment, so can only be determined with certainty in the wild relative and in the field
- …but field trials and EUPs may allow gene escape before fitness is known

Stringent Confinement and Containment
- Because we cannot be sure whether a PIP will persist in a wild relative or cause harm to the wider environment at the time of an EUP, we must assure that gene flow does not occur. Therefore a cautious approach should be taken concerning confinement if a wild relative exists or if the crop is not domesticated
- *Containment should be the goal,* however, "*containment cannot be guaranteed"* (NAS)

Recommendations:
Achieving Stringent Confinement
- NAS: Check for changes in reproductive characteristics in PIP crops *prior to field trials and EUPs*
- Research on the importance of the target pest in restricting the spread of wild relatives should be conducted *prior to field trials and EUPs*

- NAS: Confinement methods should be *redundant* at all points of possible gene flow, using methods with different *vulnerabilities*

Recommendations:
Achieving Stringent Confinement
- Because confinement methods are not well developed, geographic isolation from wild relatives should be practiced in most PIP field trials and EUPs
- In cases where a wild-relative is an important weed, is important ecologically, or where adequate confinement is not available, PIP field trials and EUPs should generally not be granted

Conclusions
- Understanding gene flow and fitness are of fundamental importance in ensuring the safety of EUPs, and should be addressed early in PIP development.
- EUP and field trial guidelines should be developed for determining fitness, and whether exposure beyond the test field will cause environmental harm
- EPA and USDA should perform basic research to improve confinement methods, and develop guidelines for how and when to use them.

EXPERIMENTAL USE PERMITS: THE ROLE OF ECOLOGY FOR PROCESS AND COMPLIANCE
L. LaReesa Wolfenbarger (University of Nebraska at Omaha)
[Power Point presentation]

Workshop topics
- application and permitting process
- permit terminology and definitions
- enforceability of EUP language and activities
- containment and confinement issues
- content and data requirements
- compliance issues

Academic Interests in EUPs
- Product development
- Ecological impacts
- Human health impacts

My academic interests in EUPs
- Research on long-term ecological impacts of commercialized transgenic crops
- Approaches to minimize these prior to commercialization

Goals of ecological interests
- Strengthen support for the registration process to evaluate ecological impacts
  - Ecologically relevant endpoints
  - Adequate data collection
- Reduce unpredictable outcomes
  - Maximizing confinement

Pathways for ecological effects from PIPs
- Non-target effects

  - acute
  - cumulative
  - intergenerational

- Invasiveness
  - of organisms (volunteers)
  - of genes (gene flow)

Predicting ecological effects

- Information sources:
  - Source of transgene
  - Transgene function
  - Phenotype
  - Species
- But…..

Expect the unexpected

- Gene x Gene Interactions
  - Position effects
  - Epistasis
  - Pleiotropy
- Epigenetic Interactions
- Gene x Environment Interactions
- Beneficial mutations
- Changing adaptive landscapes

Ecological consequences

- Negative impacts on
  - Populations
  - Species
  - Communities
  - Ecosystem function and services

Ecological basis for EUP

- All pesticides have the potential of causing harm and presenting risks to the environment

Ecological impacts and EUPs

- EUP framework and language strongly supports interests in ecological impacts

Purpose of EUPs

- to allow prospective registrants to generate information or data necessary to register a pesticide under Section 3 of FIFRA

- *data on ecological impacts is integral to the registration process*

Requirements of EUPs

- Confinement
- Temporary tolerance under FFDCA
- *Confinement minimizes the pathways by which ecological effects can occur.*

Overlap between EUP language and minimizing ecological effects

- *Maximizing* confinement
- *Adequate* data acquisition on *ecologically-informative* endpoints

Maximizing confinement

- Increasing resources for enforcement of compliance
- Incorporating studies of its effectiveness into data requirements for issuing EUPs

Ecologically-relevant endpoints

- Toxicity tests are an important first step for predicting non-target effects.
  - Information on standard organisms provides an important baseline
  - Information on a breadth of trophic levels

Ecologically-relevant endpoints

- Toxicity tests have limitations for detecting higher order ecological impacts.
  - Information on potential ecological impacts on a species obtained only if there is a significant effect
  - Negative results can leave a multitude of hypotheses unanswered

Ecologically-relevant endpoints

- Negative results from toxicity tests do not predict ecological impacts
- Need to complement with endpoints from field studies
- Organisms and guilds that ecologically interact with the PIP directly and indirectly

A role for the EUP process

- Promote experimental and adaptive management approaches to all pre-commercialization releases
- Encourage the use of power analyses of experimental designs and negative results

Information from an experimental approach into the EUP process…

- species sensitivity
- ecological interactions
- ecological variation over time
- regional ecological differences

Goals for ecological interests

- Strengthen support for the registration process to evaluate ecological impacts
- Reduce unpredictable outcomes

QUESTIONS AND ANSWERS FOR PANEL SESSION: GOALS RELATED TO ACTIVITIES UNDER EUP

Ann Sorensen (American Farmland Trust)
I'd like to thank all of our panel members. There is plenty of time to ask questions. Please speak clearly. We are trying to record as much as possible.

Q. This question is for LaReesa. You mentioned the need for better environmental data on ecosystems effects to make sure no organisms are affected in the field. What organisms should we be monitoring?

A. The obvious ones to monitor would be soil organisms. We could collect better information on an ongoing basis on effects on soil. When the scale of experiments gets larger, monitoring could move to other organisms as well.

Q. LaReesa, when looking at negative toxicity results for a variety of organisms and gauging effects on invertebrates, are you suggesting by "negative" that we are just not choosing the right tests? Second, the objective is to field test and not get exposure, right?

A. Toxicity and field testing are a first important step. The emphasis should be to use the EUP process to collect data to assess ecological impact. The expansion would be looking at infield organisms that might directly interact with that crop during the EUP process. That information can be part of the registration of that product. By incorporating it earlier and earlier, we get temporal data that is really important. There would have to be a spatial component as well.

Q. More as a statement, to follow up on indirect effects, there is a tremendous amount of work by the USDA's equivalent in the United Kingdom, looking at indirect impacts on birds by looking at management strategies in terms of tillage, seasonality and applications. Seed banks and invertebrates are having a true long-term effect on populations of partridges—impacting food availability to birds during breeding season. We need to have that incorporated more often by corporations and the environmental community. I look forward to seeing cooperation in this meeting.

Q. LaReesa, could you interpret the slides that data be provided that explain the efficacy of containment? Could you expand on the type of data that would be included?

A. One possibility would be a highly outcrossing crop. Here we would use an array of crops around field test to monitor the frequency of gene flow. If containment was 100 percent, there would be no gene sequences detected in trap plants. That is one example.

REGULATORY REVIEW PROCESS OF FIELD TESTING

USDA APHIS NOTIFICATION AND PERMIT PROCESS

Susan Koehler (USDA APHIS)
[Power Point presentation]

Outline

- APHIS laws and regulations
- Introduction under permit vs. notification, criteria, information requirements and performance standards

- Compliance mechanisms
- Interagency coordination

US Regulatory Framework for Plant Biotechnology

Agency	Products Regulated	Laws Applicable
USDA, APHIS	Plant pests and noxious weeds Veterinary biologics	FPPA, PQA (PPA) Virus, Serum, and Toxins Act
EPA	Plant incorporated protectants (biopesticides) New Pesticide Uses	FIFRA & Federal Food, Drug, and Cosmetic Act (FFDCA)
FDA	Food, food additives & feed Vet. & human drugs and human biologics	FFDCA FFDCA & Public Health Service Act

What is regulated under APHIS regulations at 7 CFR 340?

- Essentially any organism which has been **altered or produced through genetic engineering**
- if the donor or recipient organism, or vector is a plant pest or is an unclassified or unknown organism
- or any product which contains such an organism
- or any other organism or product altered or produced through genetic engineering **which the Administrator determines is a plant pest or has reason to believe is a plant pest**.

Where to go for help
User's Guide for Introducing Genetically Engineered Plants and Microorganisms
PERMITS | NOTIFICATIONS
http://www.aphis.usda.gov/brs/usergd.html

Introductions under 7 CFR 340:
Permits vs. Notification

	Permit	Notification
Organisms Eligible	All	Plants, no noxious weeds
Traits	No specific restrictions	Certain risk-based restrictions; e.g. pharmaceuticals, industrials
Confinement measures	Applicant provides details, APHIS issues conditions	Applicant certifies compliance with Performance Stds.
Reviews: Field test Importation Movement State Concurrence	Up to 120 days 60 days 60 days Yes	30 days 30 days 10 days Yes
Site Inspections Field Data Reports	Yes Due after 6 mo.	Yes Due after 6 mo.

Notification Eligibility Criteria

- Any plant not considered a noxious weed, or a weed in the release area.

- Introduced genetic material
  - Must be stably integrated
  - Function must be known
  - Must not result in plant disease
  - Must not cause production of an infectious entity
  - Must not encode products:
    - Toxic to nontargets that feed or live on the plant
    - Intended for pharmaceutical or industrial non-food use
    - Known or likely to cause disease in humans or nontarget animals

Notification Eligibility Criteria

- Introduced genetic material must not be derived from animal or human viruses

- If derived from a plant virus
  - must be noncoding regulatory sequences of known function,
  - or sense or antisense (or RNAi) viral gene constructs from plant viruses prevalent and endemic in the release area and that include the recipient plant species as a host, and
  - must not encode a functional noncapsid product responsible for cell-to-cell virus movement.

Introductions under 7 CFR 340:
Permits vs. Notification

Information required	Permit	Notification
Responsible party	Yes	Yes
Duration of introduction (1st planting - final harvest)	Yes, can be multi-year	Yes, must be renewed annually
Recipient species	Yes	Yes
Description of Genetic Construct (regulatory regions, genes, & donors)	Yes, including copy number & whether integrated into genome	Yes
Transformation method	Yes, complete description of vector	Yes
Phenotype and category	Yes, plus expression of genetic material, products, secretions	Yes, only 1 phenotypic category per notification
Introduction location, # releases & acres, or # movements & amount	Yes, plus all intermediate locations	Yes
Purpose of Introduction	Yes	No
Detailed description of production or experimental design, and the final disposition	Yes	No
Confinement procedures and safeguards to prevent contamination, dissemination and unauthorized release during development and release of the regulated article	Yes	No, but methods to meet performance standards must be available

Performance Standards for Confined Field Tests

- Eliminate viable vector agent
- Contained shipping and maintenance at facilities to prevent release of viable material
  - Prevent inadvertent mixing from planting
  - Maintain appropriate alley ways for equipment
  - Clean farm implements
- Maintain identity of transgenic material in use and devitalize when no longer in use.

Performance Standards for Confined Field Tests

- Regulated article or its offspring cannot persist in the environment. Consider:
  - Termination prior to flowering or male sterility
  - Proximity to sexually compatible species, flowering cycles, extent of outcrossing and pollen dispersal
  - Seed dispersal by biological or physical mechanisms
  - Mitigation measures: inhibit or remove flowers, bagging, wind breaks, border rows, temporal differences, isolation distances (e.g. AOSCA Standards for foundation seed production)

Performance Standards for Confined Field Tests

- Viable material is removed and volunteers are monitored and managed to prevent persistence.

Consider:

- Harvest and destroy or contain propagative material
- Herbicide treatment of vegetative material
- Disc, cut, chip, mulch, or bury vegetative material for decomposition on site
- In subsequent growing season(s),
  - Consider land use restrictions / herbicide trt.
  - Monitor as long as seed could remain dormant
  - Destroy volunteers prior to flowering

Performance Standards for Confined Field Tests Under Notification

Corn	660 ft. isolation, detasseled or bagged. 1 yr. Monitoring.
Cotton	660 ft. isolation, or 40 ft. perimeter border of nontransgenic cotton disposed of by harvesting, discing, and monitoring. Scout for *G. tomentosum* or *G. thurberi.* 1 yr. Monitoring.
Potato	Male fertile: 1320 ft. or 30 ft. border row disposed of as RA. Special precautions where native Solanum exist (e.g. AZ, NM, TX). Male sterile: no special precautions. 2 yr. Monitoring
Rape	B. napus: 660 ft. isolation, or 30 ft. perimeter border of nontransgenic canola treated like RA. 3 yr. Monitoring
Soybeen	No special precautions, sufficient alley between rows. 1 yr. Monitoring

Regulatory Compliance Mechanisms:
Inspections and Reporting Requirements

- Inspections of records, facilities or sites by APHIS or State officials

- Field test reports due six months after field test termination
- Include methods of observation, resulting data, and analysis regarding all deleterious effects on plants, nontarget organisms, or the environment
- APHIS shall be notified of any unusual occurrence within:
  - 24 hours in the event of an accidental/unauthorized release
  - five work days if plants are destroyed by disease or other causes

Handling Compliance Infractions
- Assess seriousness and magnitude of current infraction, and compliance history
- Consider remedial measures by APHIS or permittee to further prevent accidental or unauthorized release or spread of the regulated article or plant pest, e.g. crop destruct or quarantine
- Official Warning letters
- Civil Penalties—maximum of $50,000 to $500,000; or twice the gross gain or loss

Coordinating the U.S. Regulatory Framework for Biotechnology
Greater and timely interagency coordination:
- APHIS and EPA working on coordination of confinement options for PIPs and inspections
- APHIS and EPA supporting research and development of better protocols for nontarget studies
- Share information on reviews of applications
- OSTP seeks comment on proposed Federal actions to update field test requirements and to establish early food safety assessments for new proteins http://www.ostp.gov/html/redregbio.html
- Interagency input on APHIS proposal to revise regulations.

US EPA PLANT-INCORPORATED PROTECTANTS EXPERIMENTAL USE PERMIT PROCESS

Mike Mendelsohn (USEPA)
[Power Point presentation]

Under What Law are EUPs Required?
- EUPs are issued under § 5 of FIFRA for generation of information/data necessary to register a pesticide under § 3 of FIFRA

Code of Regulations
- 40 CFR Part 172 contains detailed information on EUPs
- 40 CFR Part 174 contains detailed information on PIPs

When are EUPs Needed?
- Testing on a cumulative total of over 10 acres
- For pests that occur in different geographical situations, over 10 acres per pest

Containment of PIP and PIP Pollen
- For synthetic pesticides, tolerances may not be required if food and feed commodities are prevented from entering commerce

Containment of PIP and PIP Pollen
- For PIPs, containment is more difficult

Containment of PIP and PIP Pollen

- The harvested crop must not enter commerce and outcrossing of PIP pollen to surrounding crops must be prevented regardless of test plot size
- PIP containing food or feed in commerce is adulterated without a tolerance/ tolerance exemption
- PIP EUP for food/feed crops will only be issued with food tolerance or adequate containment of the food/feed crop demonstrated

Transparency

- EPA strives to involve all stakeholders—the manufacturers, the growers and the public

Transparency

- PIP EUP application receipts and EUP issuance decisions are published in the Federal Register. Public comment is received and considered. Applications are posted on the web via e-docket, http://www.epa.gov/edocket

Fees

- Basic EUP Application Fee
- Small Companies May Receive a Fee Waiver

Application Document Classification

- EUP applicants must classify each document that they submit as either:
  - A. Non-Confidential: Anyone can view
  - B. Data: Protected by FIFRA § 10(g) / Must sign affirmation of Non-multinational Status Form to view
  - C. Confidential: Only U.S. federal employees w/FIFRA Confidential Business Information (CBI) clearance can view

Unique PIP Confidentiality Requirements

- 40 CFR Part 174.9
- *Confidential Business Information claims for Plant-Incorporated Protectant Submissions*
- CBI claims without substantiation cause PIP EUP applications to be considered incomplete

Unique PIP Confidentiality Requirements

- Application review suspended until substantiation submitted

Seed Increase

- Plantings solely for commercial seed increase are prohibited under an EUP. However, if the EUP is for the generation of information or data to support a registration, the seed produced may be saved
- A limited seed increase registration under § 3 of FIFRA is required if full commercial registration not in place

Pre-Submission Meeting

- Strongly Recommended to Ensure Complete Package

Application Contents

- EUP Application Form

- Cover Letter
- CD w/ PDFs of "A" Documents
- Experimental Program/ Section G including states, acres, duration, amount of PIP proposed for use, study protocols, etc.
- Participants - Responsible for experimental supervision. To change the participant requires amendment of the permit.
- Cooperators - Grant permission for EUP PIP to be used on application sites which they own or control. Cooperator information must be provided prior to planting and in the final report. Cooperator information may be provided with the application or submitted later on.
- Information on Prior Testing /Supporting Data and Data Matrix. Submitted data (3 copies) must be bound and formatted in accordance with the requirements of Public Register (PR) Notice 86-5
- Containment
- Confidential Statement of Formula - Ingredient % as % of plant protein for the whole plant and for each plant organ, i.e. pollen, leaf, root, stem, grain or fruit
- EUP Label. Seed bags must have an EUP label during shipment and be in the possession of participants. Confidential Statement of Formula (CSF) and label must agree. The inert marker need not be identified by name, but it's percentage on a whole plant basis must be listed. The active and inert PIP ingredients do not need to add up to 100 percent. The label must also indicate the establishment registration number, except in those cases where application of the pesticide is made solely by the producer

Delivery and Mail/Postal Addresses are Different!

Addresses - Delivery and Mail/Postal Addresses are Different
- Postal - Application Submission
- (Do not send CDs or computer disks via U.S. Mail.)
- Document Processing Desk (EUP)
- Office of Pesticide Programs (7504C)
- U.S. Environmental Protection Agency
- Ariel Rios Building
- 1200 Pennsylvania Avenue, N.W.
- Washington, DC 20460

Addresses - Delivery and Mail/Postal Addresses are Different
- Courier - Application Submission
- Document Processing Desk (EUP)
- Office of Pesticide Programs (7504C)
- U.S. Environmental Protection Agency
- Room 266A, Crystal Mall 2
- Jefferson Davis Highway
- Arlington, VA 22202-4501

Office of Pesticide Programs - What Happens to My Application?
- Document Processing Desk
- Application screen; company number and EUP application number assignment
- (Letter sent to applicant indicating EUP application number.)
- 86-5 screen for data formatting standards (If passes, letter sent with (Master Record Index Number) MRID number assignment/ If fails forwarded to BPPD.)
- MRID = Master Record Index Number and is the key to retrieval of data from data archives.

- Initial OPPIN EPA computer tracking system input
- Fee processing and recording

Biopesticides and Pollution Prevention Division - What Happens to My Application?
- Initial inprocessing / 86-5 deficiency letters sent
- Screen for completeness / science and administrative
- Schedule determined once passed; docket set up; federal register notice announcing receipt to public; Federal Register is the U.S. Government publication of actions and activities and is where public comment is solicited. Receipt of EUP extensions and amendments usually also require announcement in the federal register.
- Data sent to contractor for primary review
- BPPD secondary review of data and risk assessment/ consideration of public comments

What Happens to My Application?
- Science team meetings
- Consultation with EPA attorneys
- Communication with other regulatory agencies (often involves FDA and USDA/APHIS).
- BPPD/EPA risk management decision
- EUP issuance letter if submission satisfactory
- BPPD notifies regional offices; Federal Register notice announcing issuance of EUP; communications strategy (press, other federal agencies, interested parties)

Post Federal Approval
- Reports
- The permittee must provide a final report within180 days of the expiration of the permit. The final report must include all of the items set forth in 40 CFR 172.8(b)
- State notification and approval
- Distribution and sale only through participants in the approved experimental use program.
- Advertising for sale forbidden. Use only in accordance with EUP
- Compliance visitations

QUESTIONS AND ANSWERS REGULATORY REVIEW PROCESS OF FIELD TESTING

Q. This is for Mike. Could you give clarification on a couple of points from the last slide [Post Federal Approval]? It suggested that even with a tolerance, the sale or distribution of a PIP crop can only be done by participant. What if you have contamination of a surrounding crop? Would a temporary tolerance cover that?

A. There are two issues we are looking at: the sale and distribution of PIPs. With EUPs, the actual bags are labeled, so those seeds planted under PIP cannot be sold or planted except by participants. Under an EUP, you are talking about the crop growing out. If there is a temporary tolerance, sometimes companies are allowed to sell it. If the experimental program indicates the crop must be destroyed or contained, then you must follow that. If you don't have that, then the food commodity can be sold in commerce. Again, this ties back to food not considered adulterated. Sometimes permittees have restrictions that go beyond that.

Q. The other question I have addresses a concern of mine—the potential gene flow into wild relatives. You mention that companies must have either a tolerance or adequate containment. To clarify, tolerance covers human health risks and liabilities. What I'm wondering is that if you have tolerance, then does containment have to be as high? Are you then focused on environmental health contact?

A. I can answer your question this way. There are cases where containment does address ecological concerns. An example is a good public comment on rootworm that came in. One of the things in early corn rootworm EUPs that restricted the planting of material to areas was a concern about the possible presence of endangered coleoptera (beetles that might be susceptible to the PIP). We judge on a case-by-case basis as to what sort of data and necessary containment is needed. It is a complex situation. We have limited EUPs based on the ecological situation. You can see it on our website—it is a Biopesticides Registration Action Document (BRAD). In the case of the corn rootworm EUP, we put a restriction into the permit, that they could not plant near endangered beetle species.

Q. On the issue of outcrossing with wild relatives, do you have any specific guidance?

A. This is not a major issue for EUPs granted thus far. For cotton, it is an issue, currently addressed through geography. There is a lot of information about this in the BRADs.

A. Currently with USDA procedures, all plants—PIPs involving corn, cotton and other commodities—would require notification. They have to meet all eligibility criteria. The PIP has to be stably integrated and can't cause non-target effects. Since most *Bacillus thurengiensis* (Bt) proteins target specific pests, this is not really an issue. Most of the Bt plants are covered. When testing novel pest resistance, it is not fully understood what might fall under the permit.

Q. What do you guess as a percent.

A. The bulk of them are well-characterized proteins, including coat proteins and viral protections. They receive permits as long as they meet eligibility standards.

Q. This question relates to PIPs. At what point, as a seed grower, do they have both experimental properties and some seed increase properties? For the seed coming in from the seed producer, you don't know which one you are doing. Most cooperatives do not know what is going on—they do not have sufficient information about what roles they are playing. At what point is there a limited Section 3 registration? Would it kick in with USDA? When do separate aspects kick in? And what about novel proteins?

A. Under the EUP, the cooperator is the individual that controls the land or lets the farmer or company use the land. Folks in control of the experiment are participants. They are bound to follow the plan (Section G) as to how land is treated. If they are under an EUP, it must be treated that way. In regards to the seed saving question, we understand legitimate work for registration can include saving seed for product—you can't just do seed increase alone under an EUP—but participants need to know what is going on with the seed.

Q. Does the tolerance exemption for Bt microbial sprays cover PIPs?

A. Information about the tolerance exemption for Bt microbials, 40 CFR180.1001, is helpful, but this tolerance exemption does not cover PIPs nor make food or feed containing them non-adulterated. You must have a specific tolerance exemption for the PIP. The way it is written recently is for the protein and genetic material necessary for the for production of the protein in that crop. We are now requiring analytical methods for that specific crop. Bt exemptions for microbial pesticide products do not cover the PIPs. There must be permanent or temporary exemptions from tolerance for each PIP that may enter the food supply.

Q. Could you provide more information on the primary review process and how many people are involved and what they are charged with—the set up of the experimental design? Are analyses appropriate? Are they responsible for developing weights and synthesis?

A. Pre-registration is critical. With public input, the actual process is that the information comes from field study. That data is then assigned an MRID number and evaluated. It comes back to us in BPPD. We then do a secondary review looking at various aspects we measure and whether we have all the pieces and the sufficiency of the data. The science advisory panel does a preliminary assessment. It depends on the specific case, there are several levels of assessment. If it is a new PIP, we may require more data. We look at characterization and ecotoxicity data and what is being done.

INTRODUCTION TO BRAINSTORMING SESSION ON PIP EUP ISSUES

Karen Heisler introduced the goals and format for the afternoon break-out sessions. Workshop participants divided into four groups to consider each of the four categories identified for the workshop. The goal of these groups was to identify PIP EUP issues to be addressed in each category, which would form the basis for recommendations created during the Day 2 Breakouts Sessions. The four categories addressed by each session were:

1. *EUP application and decision process; content and data requirements*
2. *Regulatory terminology; definitions and standards*
3. *Containment and confinement; clarification of standards, strategies to achieve*
4. *Ensuring clear permit conditions and compliance with permit conditions*

AFTERNOON BREAK-OUT SESSIONS

The following issues and concerns were raised by workshop participants. The participants' discussions during each of the four break-out sessions differed in variety, length, style and format. Therefore we have attempted to summarize the main issues identified for each category. Please refer to the appendix for details of each discussion. Consensus on these issues was neither reached nor sought and participants identified some conflicting issues. This list attempts to capture the issues raised without bias. There may be some redundancy within the list.

EUP APPLICATION AND DECISION PROCESS; CONTENT AND DATA REQUIREMENTS
SUMMARY OF ISSUES AND CONCERNS
Guinnevere Roberts (EPA OPPTS), Session Facilitator
[See appendix for discussion details]

Content of PIP EUP Applications

- Lack of formal, published data requirements
- Standardization of data requirements across applications/applicants

- Difficulty of developing standardized and/or formal data requirements while maintaining the flexibility necessary to adjust data requirements on a case-by-case basis, based on crop type, PIP type, specific risk issues, etc
- Clarification of acceptable test methods, sample sizes, non-targets, etc
- Harmonization of product characterization data requirements with USDA-APHIS, and FDA as applicable
- Balance of ecological data required for EUPs vs. generated in EUPs

Review Process for PIP EUP Applications
- Clarity and predictability of timelines for EPA reviews of EUP applications
- Clarity of the EPA review process
- Guidance/information regarding how, when, and where to submit EUP applications; and what happens once applications are received
- Opportunities to increase efficiency of the review process and the front-end process
- Opportunities to facilitate/speed review process by using standard formats for EUP applications and data tables, providing summaries, etc
- Guidance/information on purpose and process of the front-end screen
- Importance of pre-submission meetings
- Opportunities for electronic tracking of application packages

Interagency Coordination
- Coordination of EPA review process for EUPs with APHIS permit reviews
- Harmonization of EPA, FDA, USDA data requirement and accepted protocols
- Communication across agencies
- Coordination with the Fish and Wildlife Service on endangered species issues
- Coordination with USDA-APHIS on containment/confinement standards and conditions
- Reciprocal access to CBI for APHIS and EPA reviewers

Communication
- Use of pre-submission meetings
- Dissemination of information to states, regions, NGOs, general public
- Clarification of CBI policies
- Clarification of terms used in Federal Register (FR) notices
- Timing of public notices of: EUP application receipt and requests for public comment, EUP approvals, other significant actions
- Timing of state/regional notification of EUP approvals
- Use of website, FR, email lists, workshops, public meetings, and other methods of communication
- Stakeholder involvement in development of data requirement

Endangered Species Issues
- Pros and cons of EPA vs. DOI (FWS) reviews or joint reviews
- Transparency of review process
- Agency/public/state access to information re: EUP locations and locations of endangered species populations
- Appropriate notification of states/regions
- Appropriate geographic restrictions on EUPs

REGULATORY TERMINOLOGY; DEFINITIONS AND STANDARDS
SUMMARY OF ISSUES AND CONCERNS
Karen Heisler (EPA Region 9), Session Facilitator
[See appendix for discussion details]

(Note: these issues were put forward by individual participants in informal brainstorming sessions at a public workshop on PIP EUPs (Feb 10-11, 2004). Consensus on these issues was neither reached nor sought, and participants identified some conflicting issues. This list attempts to capture all issues without bias. There may be some redundancy within the list.)

General needs

- Clarify the technical parameters surrounding the regulatory terminology
- Clarify interpretation of existing terminology and develop standards
- Refine and harmonize relevant terminology across the major U.S. agencies and industries involved in the oversight of experimental field trials, issuing of experimental use permits and implementation of field trials
- Coordinate and harmonize terminology among the USDA, NIH, FDA and domestic agencies
- Coordinate and harmonize terminology among the CODEX, IPPC, Organization for Economic Cooperation and Development (OECD) and international agencies
- Need to develop terminology consistent with FAO, international agencies and governments
- Need to reach out and get public input and reach consensus on the definition of terminology

Specific terminology

- Production
  - What is the production 'unit' to be reported under Section 7 of FIFRA
  - Does the regulatory definition of PIP confound the understanding of 'product' (since the PIP is not the whole biological organism
  - What are the regulatory requirements pertaining to movement of seed from the production site to the experimental site
  - What facilities need to be registered with an the establishment number
  - Which of the following are considered production facilities: farmers' fields, the seed production facilities or the research facility
- Transgenic acreage
  - Does acreage include border rows and trap crops
  - Difficult to count acres in the case of multiple planting cycles (five acres planted twice equals 10 acres)
- Containment and confinement
  - 'Containment' is defined very specifically by NIH guidelines
  - 'Containment' does not allow the flow of genes outside the experimental facility
  - 'Containment' is supposed to be more absolute compared to 'confinement'
  - If 'confinement' is not 100% but is not quantitatively defined, what does it represent
  - 'Confinement' needs further clarification in terms of identifying acceptable levels of confinement in the field
  - 'Confinement' needs further clarification with respect to the operation of greenhouses
- Introgression
  - General regulatory definition needed because the meaning of introgression is not identical across agencies and interested parties

- Isolation distance
  - Lack of clear guidance on how to establish a reference point
  - Difficult to determine a standardized isolation distance
  - When defining distance, do we measure from last plant or last border row
  - What standards and definitions do the inspectors rely on to determine isolation distance
  - USDA-APHIS guidelines to determine isolation distance are not identical
- Temporal isolation
  - Buffer zones and fallow zones may help to establish temporal isolation
  - 'buffer' and 'fallow zones' are defined variously, inconsistently
  - Different temporal isolation options require the identification of technical parameters and tolerance levels
- Final disposition
  - Methods used to accomplish 'final disposition' need further specification
  - What about the appropriate tilling depth, as depth of till has implications for biological viability. Should tilling always specify depth
  - Tilling is defined but what are the standards associated with tilling as the context changes
  - Is there a difference between 'devitalization' and 'destroyed'
  - Is there an appropriate period of time during which final disposition should occur
- Non-Targets
  - Should 'non-target' species be universally defined or defined in relation to each PIP
  - Should there be relevance criteria to limit the universe of non-targets
  - Usually defined to species, but could be used to describe habitat
- Research site
  - Does 'research site encompass the whole research complex or just the particular acreage of the experimental field
- Planting cycle
  - Possible planting opportunities increase or decrease depending on the climatic region. 'Cycle' can be used to mean an annual cycle, or a planting cycle within and annual cycle of the seasons.
- Important link between the definition of 'cycle' and counting of acreage (same acreage counting twice equals twice the acres planted…) Cleaning harvesting equipment
  - What does 'clean' mean
  - Free of debris, free of propagating material, other
  - 'Clean' needs to be defined from a operational perspective
  - 'Clean' definition needs to be harmonized with USDA definition
- Positive and Negative Hits
  - The verification of positive and negative hits can have legal implications
  - Positive and negative hits need science-based definition
  - When reported but not verified, is it a positive or negative hit

CONTAINMENT AND CONFINEMENT; CLARIFICATION OF STANDARDS, STRATEGIES TO ACHIEVE
SUMMARY OF ISSUES AND CONCERNS
Suzanne Wuerthele (EPA Region 8), Session Facilitator
Terry Bonace (EPA Region 5), Session Facilitator
[See appendix for discussion details]

Confusion in Terminology and Definitions
- Distinguish between containment and confinement
- Inconsistency in definitions and standards across U.S. agencies and internationally. Examples: as hybridization, geneflow, outcrossing

Need for improvement of National Coordinated Regulatory Framework
- To what extent should NIH regulatory guidelines be incorporated into EUP guidelines?
- Who has effective authority in implementing identified and improved strategies?
- How do we improve state, EPA and other agency coordination of establishing standards, monitoring, and enforcement?

Uncertainty in achieving containment/confinement
- How do we ensure sufficiency of data to use in assessment?
- How do we determine that sufficient monitoring of EUPs is being implemented?
- How do we clarify state and agency authority and responsibilities involved in monitoring and enforcement?
- What constitutes failure?
- EUP land parcel location privacy and disclosure issues; do confidential business information (CBI) designations compromise the ability to monitor and enforce?
- Does the existing EUP confinement strategy adequately engage and account for less than 10 acres PIP parcels?

Establishing standards for achieving containment and confinement
- Does the system adequately balance industry research, product development and risk?
- Do different levels of categories and performance standards need to be established depending on known levels of risk?
- To what extent should other strategies such as biological and geographical confinement strategies be engaged in EUPs?
- Are we using sufficient scientifically based performance standards?
- Are endangered species being adequately protected?
- Does the EUP process sufficiently accommodate, regulate and monitor emerging technologies?

Public concern with monitoring and enforcement sufficiency
- Is the agency communicating adequately with the public?
- Is the process and EUP program transparent enough?
- Is there a strategy for keeping track of monitoring and enforcement of EUPs around the country and communicating this with the public?

ENSURING CLEAR PERMIT CONDITIONS AND COMPLIANCE WITH PERMIT CONDITIONS
SUMMARY OF ISSUES AND CONCERNS

Amy Miller (EPA Region 9), Session Facilitator

[See appendix for discussion details]

Communications and agency cooperation
- Many states monitor EUPs under a grant agreement with EPA, but communications between the states and Feds, EPA and USDA, and permit holders is poor.

- It is essential that generic terms are understood clearly by everyone. USDA and EPA may not interpret terms the same way.
- Protocols for EUPs are pretty cut and dried and there is not a lot of room for deviation. However, it's possible to do it right in one place and be fined for doing exactly the same thing in another place.
- Need to be sure that there is communication and feedback at all levels.

EUP cooperators
- EUP cooperators are sometimes not known by inspectors (cooperators are farmers working with the company holding the EUP permit, hosting plots located on their individual farms).
- Often, cooperator lists are confidential (under CBI) because of concerns over things like vandalism. EUP permit holders are, however, required to supply info on cooperators to inspection agencies.
- Notification on EUPs and the location of cooperators seems to be handled differently, varying widely from state to state.
- There is some movement underway to establish industry standards for best management practices and standards required by field stations and cooperators. There needs to be a minimal set of requirements.

Inspector Resources
- Companies should be required to provide inspectors with gene codes to determine and/or track contamination, since there may be no other method to monitor for escapes.
- There are no protocols regarding the basic information required to do an EUP inspection.
- New testing procedures and equipment needs to be developed and provided to inspectors

Inspector Training
- Inspectors are trained and they seem to be doing a good job. However, as EUPs increase, there will have to be more inspectors, more training and more effective tools provided for the inspectors.
- Inspectors seem to move around a lot within the agency. Names and faces seem to change quickly. This is an issue that needs to addressed.
- Third party auditors should also be enabled to make some spot checks and provide information to EPA on EUP compliance

EUP and Seed increase plots
- These plots may produce significantly more seed than is needed, resulting in storage and later, disposal problems. How do you determine when an EUP has crossed over into a seed increase situation?
- It may be necessary to require a section 18 registration prior to seed increase.

Public information
- To what extent do public right to know laws affect EUPs and access to the information surrounding them?
- Inspector reports should be written so that they can be released to the public. To what degree does the Freedom of Information Act (FOIA) enable release of these or similar reports?

SUMMARY OF DAY ONE, PREPARATION FOR DAY TWO

[Following the last of the breakout sessions, Karen Heisler addressed workshop participants to provide them with a brief summary of the day's accomplishments and an explanation for the following day's goals and format. Participants were instructed to choose two issue categories for which they would attend a breakout discussion the following morning.

Breakout session facilitators gathered the comments they recorded on flip charts during the breakout sessions and worked to consolidate all the issues and concerns identified by each of the four groups for each category. These issues and concerns provided the basis for the following days' discussion in each breakout session designed to provide appropriate recommendations for each issue or concern.]

WORKSHOP PROGRAM - DAY TWO

INTRODUCTION - DAY 2

Karen Heisler addressed the participants recapping the goals and format for the upcoming morning's breakout sessions addressing the four issue categories from the previous day and goals of the afternoon panel discussions. Participants were assigned two issue category topics to attend for the morning's concurrent breakout sessions.

MORNING BREAKOUT SESSIONS: REMEDIES AND RECOMMENDATIONS

The following recommendations were put forward by workshop participants. The participants' discussions during each of the four break-out sessions differed in variety, length, style and format. Therefore we have attempted to summarize the main recommendations identified for each category. Please refer to the appendix for details of each discussion. Consensus on these recommendations was neither reached nor sought, and some conflicting recommendations were suggested. This list attempts to capture the issues raised without bias. There may be some redundancy within the list.

EUP APPLICATION AND DECISION PROCESS; CONTENT AND DATA REQUIREMENTS

Summary of Recommendations
Guinnevere Roberts (EPA), Session Facilitator
[The recommendations below are arranged to mirror the issues raised in the breakout sessions on the first day of the workshop. However, some recommendations address several issues simultaneously, e.g. review of applications, communication, and interagency coordination. See appendix for discussion details.]

<u>Content of PIP EUP Applications</u>

Address concerns re: data requirements

- Develop consistent set of data requirements to ensure that all applicants are held to the same standard, and so that applicants know up front what data they will need to generate.
- Retain some flexibility within these requirements to address any issues that may arise with a specific product. Retain the ability to require different sorts of data depending on the type of crop being modified, the proposed uses, the type of PIP, waive data that is deemed unnecessary, etc.
- Involve stakeholders in the process of developing data requirements by holding a public workshop as well as a scientific advisory panel (SAP) (which provides opportunity for public comment). Solicit public comment on proposed requirements/guidelines through the FR, and disseminate the FR notice to stakeholders via email or other means to ensure that all affected groups are aware of the opportunity to comment.
- Harmonize data requirements with USDA so that developers do not have to generate different sets of data for EPA/USDA/FDA to answer similar agency concerns.

- Do not harmonize data requirements with USDA as the agencies operate under different mandates, have different concerns, different regulatory standards.
- Identify acceptable protocols for non-target tests, product characterization, etc. Harmonize with USDA where appropriate.
- Require more ecological data at EUP, specifically data designed to ensure that there are no adverse impacts of EUPs on threatened or endangered species, or on ecosystems/wild relatives.
- Do not require more ecological data at EUP stage as the EUP is designed to generate this type of data.
- Address concerns re: threatened and endangered species, and hybridization with wild relatives through restrictions/conditions of EUPs rather than through data requirements.

Review of PIP EUP Applications

Improve pre-submission meetings

- Make pre-submission meetings mandatory for all EUP applicants
- Applicant to submit request for pre-submission meeting to EPA more than two weeks prior to requested date of meeting to allow sufficient time for scheduling.
- EPA should let applicant know in advance of the meeting, what information to bring with them.
- Office of General Counsel (OGC) presence at pre-submission meetings could expedite the process by allowing legal questions to be resolved on the spot. A concern was raised that if EPA has counsel present, applicants would desire to bring their counsel as well. Another suggestion would be to have OGC "on call" (but not present) during meetings to answer questions on an "as needed" basis.
- Be more specific in pre-submission meetings about exactly what data is required/requested and the purposes of this data, to minimize the risk of misunderstandings between EPA and applicants (i.e., to reduce the chance that applicants will spend time and money producing data that they think meets EPA requests but is later determined to be insufficient in some way.)
- Hand out guidance on application submission and review process to applicants.
- Require applicants to write up formal minutes of pre-submission meetings, submit them to EPA, and get concurrence from EPA on the minutes. Include information on any data guidance received, expected milestones, etc.
- Have follow-up meetings with applicants as needed.

Facilitate application submission and review process

- Explore electronic submission process
- Develop way to track status of application post-submission
- Send notification to applicants when applications pass specific milestones, e.g., receipt, completion of various stages of front-end screen, completion of primary review, of secondary review, completion of required FR notices, etc.
- Develop standard format for application, or template application form.
- Look at how the pharmaceutical industry has approached development of a standard format through the International Conference on Harmonization, to see if this can be used as a model.
- Consider whether an "integrated summary letter" would be helpful.
- Develop standard format for submission of data. Communicate requested format for data tables, etc
- Develop template for FR notice of application receipt that applicants can download, complete, and submit with application. (similar to template that they complete for temporary tolerance). Determine whether this could be developed for any of the other FR notices required.

Interagency Coordination

Improve coordination with USDA-APHIS and FDA

- Give EPA staff access to APHIS data, data reviews/assessments, and CBI submitted under USDA statutes (through MOU?)
- Harmonize data requirements, acceptable protocols/methods/experimental design/sample sizes/ non-target species between USDA-APHIS and EPA-BPPD for EUPs
- Communicate with USDA-APHIS during USDA and EPA rule-making efforts to improve consistency of data requirements.
- Harmonize containment/confinement standards
- Coordinate with FDA regarding product characterization

Communication

Develop guidance for applicants and stakeholders

- Information on submission process:
    - Who to contact with inquiries
    - How and when to submit request for pre-submission meeting
    - What information to bring to pre-submission meeting
    - What information to generate for/submit with application
    - What to include in a summary letter
    - How and where to send application and data
    - Requested format for data and other information
    - Expected timeline for review
    - Expected fees

- What happens to an application post-submission
    - Stages of the front-end screen
    - Timeline and purpose of primary (contractor) review
    - Timeline and potential delays in FR process

- Other information
    - How to access dockets and other publicly available information
    - Glossary of terms used in application forms and FR notices (e.g., participator, cooperator, maize demonstration, etc.) (request to post this info on BPPD website or somewhere other than dockets or guidance document).
    - Expected timeline for entire submission, screen, review, and announcement process

Disseminate guidance for applicants and stakeholders

- To applicants (hand out at pre-registration meeting)
- To public (post on BPPD website)

Improve communication with stakeholders

- Reduce lag time between actual receipt of an application and publication of receipt in the FR.
- Disseminate FR notices to listserv's

- Maintain a list of interested parties from non-government organizations (NGO) community to contact re agency actions. Do not maintain such a list as it would be unfair to parties not included on list
- Explore methods of communication to use in addition to FR notices, e.g., post information prominently on BPPD website, consider posting or sending to other websites, professional societies, or interest groups.
- Maintain up-to-date list of EUP applications received, EUP applications granted
- Post information on how to access dockets and other information on BPPD website
- Post glossary of terms used in applications, reviews, and FR notices on BPPD website

Improve communication with states

- Formalize process for EPA HQ notification to regions of EUP approvals, amendments, and renewals, and EPA regional notification to states.
- Explore methods of notification to supplement FR notices
- Ensure that states have information on cooperators, and changes to cooperators

Endangered Species

Ensure EUPs do not pose risks to threatened/endangered species

- Require consultation with Fish and Wildlife Services (FWS)
- Notify state officials of any potential endangered species concerns in their state.
- Require location information to be submitted by county to facilitate consultation with FWS and/or EPA review of potential impacts
- Allow public access and/or state access to location by county
- Use geographic or other conditions/restrictions to ensure that no endangered species are adversely impacted and/or mitigate potential effects. For example, require that EUPs for PIPs that target Lepidoptera species are not allowed in critical habitat for Karner Blues.
- Develop and post statement on BPPD website that 1) affirms that EPA is taking all actions necessary to ensure that EUPs do not result in the take of endangered species, 2) describes EPA constraints regarding release of CBI location information and FWS concerns about releasing information on critical habitat and locations of threatened populations, and 3) affirms that interagency discussions are conducted. Goal would be to inform and reassure the public about EPA's process for considering potential endangered species concerns.

REGULATORY TERMINOLOGY; DEFINITIONS AND STANDARDS

Summary of Recommendations
Karen Heisler (EPA Region 9), Session Facilitator
[See appendix for discussion details]

(Note: These issues were put forward by individual participants in informal brainstorming sessions at a public workshop on PIP EUPs (Feb 10-11, 2004). Consensus on these issues was neither reached nor sought, and participants identified some conflicting issues. This list attempts to capture all issues without bias. There may be some redundancy within the list.)

General Recommendations to Clarify Terminology

- Clarification of terminology should be as open as possible to allow for input from the relevant stakeholders.

- Coordination between the USDA and the EPA are of particular importance in order to reach a high degree of terminological alignment.
- Clarify terminology through intra-agency discussion.
- Clarify terminology in terms of standards, objectives and performance measures and consistency with APHIS.
- Instead of reinventing the wheel and adding new definitions to the regulatory framework, work with the existing agronomic terminology (industry and academic standards) and within existing FIFRA framework.
- EPA and State agencies are involved in the enforcement of EUPs. Standardizing terminology facilitates compliance.

Approaches to Clarify Terminology

- Rulemaking
  - As the scope of terminological clarification broadens, the process of rulemaking slows down.
  - Rulemaking is binding and may contribute to changes in the rules of the game. It is probably better to clarify terminology from a prescriptive perspective.
  - May involve legal opinion in certain circumstance.
  - To avoid some of the limitations of rulemaking rely on a more flexible rulemaking approach, such as negotiated rulemaking.
  - Need to consider the advantages and limitations of focused versus sweeping rulemaking.
  - Through FR notice it is possible to get input from the stakeholders about the clarification of terminology
  - Need to determine if FR notice as effective as Section G in leading to compliance by research directors, cooperators, etc.

- Guidance (using Pesticide Registration Notice - PRN)
  - Ensures an acceptable degree of conceptual flexibility and allow for the development of appropriate performance standards.
  - Contributes to the development of flexible definitions. If applicants have other definitions allow them to come forward to avoid confusion. Through the PR notice it is possible to link the purpose of specific terminology with the appropriate performance measures and stimulate public input.
  - The PR notice stays within the realm of regulatory guidance.
  - The PR notice allows for terminological flexibility.
  - The PR notice also allows to communicate relationships between purpose and terminology.

- Defining Terms within the Permit
  Through the inclusion of regulatory and enforceable definitions within permits it is possible to clarify some of the existing terminology.
  - Important to have permits that everybody understands in terms of their obligations to the public, inspectors and permittees.
  - List of definitions for the permit could be created by each registrant who comes in (can lead to inconsistency among permits).
  - EPA can help with the clarification of terminology in the permit.
  - Need to clarify what constitutes a permit vis-à-vis all the parties involved; does it include the Section G and confidential list of cooperators?

- All parties (cooperators etc.) need to be aware of the conditions and terms of the permit.

CONTAINMENT AND CONFINEMENT; CLARIFICATION OF STANDARDS, STRATEGIES TO ACHIEVE
Summary of Recommendations
Suzanne Wuerthele (EPA Region 8), Session Facilitator
Terry Bonace (EPA Region 5), Session Facilitator
[See appendix for discussion details]

Develop clear and consistent definitions among federal agencies and affected parties.
- Refer to statutes first for clarification and direction
- Harmonize standards among agencies.
- Consider stratified definitions for terms specific to context. For example, in defining "hybridization", clarify the definition to make sure it is more inclusive of different levels or types and to cross-species boundaries and gene flow.
- Differentiate between process definitions and scientific definitions.
- Create a guidance document setting guidelines and definitions section for USDA, FDA and submit for public comment.
- Incorporate evolving definitions and how they are affected by new crop considerations, such as "gene flow."

Establish containment standards.
- Standardization is critical to alleviate disincentives and frustrations of all parties involved. Ad-hoc establishment of standards is not desirable.
- Refer to existing models, such as NIH models - a risk-based model.
- Consider the NAS report, which suggests that there should be integrated containment systems, up front standards and methods for expanding containment efficacy.
- Incorporate legal based standards with the risk-based component
- Balance scientific recommendations with enforceability and effect on the field for an inspector
- Consider NIG biosafety guidelines for containment.
- Refer to EPA/USDA policy documents on field storage of bio-solids as a model.
- Validate that existing standards for confinement are sufficient and communicate the results with the public.
- Investigate when standards can be set ahead of time, before the permit process.
- As a the number of crops grow eligible for EUPs, it may be possible to group the types of crops by category and set specific monitoring or testing for these groups.

Identify and address adverse effects of containment failure from less than 10 acre plots
- Make sure university and other researchers are aware that regulations prohibit contamination of food supply regardless of size of PIP.
- Clarify the different regulatory requirements and discretionary latitude EPA and USDA have in this issue and clarify APHIS role to eliminate unnecessary overlap. If APHIS is involved, then EPA should not need to be.
- Consider case-by-case and geographical considerations in small plot risk to endangered species.

Incorporate considerations of biological and geographical containment into the EUP application and inspection process.
- Monitor and evaluate ongoing development of biological control mechanisms for its potential use as a containment mechanism in conjunction with existing strategies.

- Consider biological standards where appropriate, especially as new crops come on line for applications. Use what works based upon performance standards.
- Determine nominal up front standards with understanding that standards may evolve with development of new methods.
- As long as data provided by applicant demonstrates efficacy of confinement standard, EPA should accept that data, whether biological or otherwise.

Collect and monitor EUP monitoring data
- Create incentives for companies to collect data and make it public
- Collect type and amount of data consistent with EPA's tiers and categories.
- Risk mitigation research is critical in determining the amount of data needed.

Minimize risk of containment or confinement failure on endangered species.
- Determine to what degree reliance on the use surrogate species is adequate to protect endangered species.
- Maximize communication between agencies in any actions that might affect endangered species.
- Communicate and substantiate in appropriate circumstances what measures EPA is taking to protect endangered species in the EUP process.
- Refer to application to determine where applicant is performing the research. The EUP application letter will delineate areas to avoid for endangered species problems.

Assure the public that adequate testing is being done.
- Do a better job of educating the public about the amount of information available through EPA.
- Make better use of EPA e-docket website.
- Place EUPs on the PEST listserve, but stream line/organize the list serve to isolate PIPS effectiveness and usefulness.

Assure public that EPA is addressing the adequacy of reporting adverse affects and post 9-11 concerns with food security and the environment.
- Clarify EUP PIP permittee responsibility and make this responsibility known to the public
- Publicize that EPA 98 PR notice and FIFRA 6A2 addresses adverse registered products and make these notices more readily available to the public.
- EPA must be responsive to public concerns, despite apparent evidence that genetically altered proteins in the soils and the environment are not presently harmful.
- The Federal Coordinated Framework is theoretically designed to oversee all genetically altered organisms (FDA, NIH, EPA and USDA) and therefore it is critical that coordination is emphasized and maximized.

Encourage EPA and the states cooperation to set EUP standards
- Consult with individual states before EUPs are issued.
- Determine to what degree individual states have stricter standards than EPA and communicate and publicize this information.
- Share information from this workshop in setting guidelines in State FIFRA Issues Research and Evaluation Group (SFIREG) meetings.

Create process within agency to keep current on emerging issues and concerns.
- Communicate to the public EPA's response to recommendations of SAPs.
- EPA should consider the NAS report, also geared to the USDA, which suggests that there should be integrated containment systems and suggests methods for expanding containment efficacy.

- Examine EUPs that don't have a food tolerance or don't have an exemption.

ENSURING CLEAR PERMIT CONDITIONS AND COMPLIANCE WITH PERMIT CONDITIONS

Summary of Recommendations
Amy Miller (EPA Region 9), Session Facilitator
[See appendix for discussion details]

State/EPA/Region/USDA priorities, coordination and communication

- Each state has its own internal structure developed to varying degrees for regulating biotech. There is no inventory of these with detailed information available.
- Cooperative grant program is the driver behind state priorities. Each state has its own cooperative agreement with EPA and receives different amounts of money. More focus on these agreements could coordinate priorities and improve quality of programs.
- There seems to not be a great deal of communication between EPA and USDA. A liaison office between the two agencies on this issue would have tremendous potential benefits.
- There needs to be a coordinated framework for inspections and monitoring. For example, in order to contain unique genes all involved need to be clear on expectations and tasks.
- Reduce duplication of efforts to conserve staff and funding resources.
- In order to facilitate coordination, formal MOUs may need to be created for the agencies and entities involved.

How states regulate PIP EUPs

- USDA laws are somewhat different than EPA and they do not necessarily look at tolerance issues. There may be a need in all rules for minimal tolerance requirements, to contain genes and ensure that these do not spread into the food supply.
- Permits need to clearly state what is required of permittees.
- EPA and USDA should be sharing information on EUPs at all levels.
- EPA needs to decide how hard it's going to push states on the administration of EUPs. Some states have made the determined that EUPs are "not a pesticide" and therefore have stayed uninvolved in their administration. This issue needs to be addressed at the highest levels within the agencies involved.

Procedures/tools

- Determine and clarify what the purposes and goals of EUP provide inspectors with for clear and specific guidance.
- Practices that the seed industry recognizes as good practices do not necessarily apply to the practices required for gene containment. Develop specific practices for gene containment where necessary.
- Document a minimum number of EUP inspections every year and communicate the results at national meetings for the benefit of inspectors.
- Provide states with standardized Geographic Positioning Systems (GPS) tools to determine acreage of plots and for isolation purposes.

Endangered species

- Inspectors should consult with county or other appropriate bulletins or resources to avoid placing EUPs in areas with endangered species. These considerations should also be incorporate into the permit process or inspection process where appropriate.

- Coordinate EPA and state procedures and communication on EUP inspection to accommodate protection of endangered species.

Public knowledge/communication/CBI

- Incorporate public access to information in the grant reporting requirement.
- Improve communication with the general public and public access to information about what EPA is doing in regulating EUPs, specifically addressing pubic concern about CBI and its application to EUPs.
- Inspection reports and general inspection information should be available for public release on a limited basis accommodating CBI issues. Reporting this information will build public confidence in the EUP process and can be accomplished without compromising CBI issues.
- EPA needs to generate information on PIP/EUP inspection numbers, including total numbers, general locations (state), percentage inspected, number of EUP violations, types of violations, number of escapes, etc.

Training and resources for Inspectors

- Engage USDA's experience in developing inspection training materials and state compliance guidelines.
- EPA should provide formal training to EUP permittees. Since violations that occur often are accidents, and most permitted companies provide their own training to their cooperators, many EUP violations can be prevented. Refer to USDA's experience in training.
- Consider requiring permittees to conduct mandatory sampling. USDA does not have the resources to set up it's own laboratories and reference materials, so it collaborates with GIPSA for analytical testing.
- Develop user-friendly technology for inspectors. In situations where simple tests are available (ELIZA, dipstick) for field testing that require minimal training, these should be made available to the regulatory agency by the permittee to monitor EUP compliance.

- Consider third party lab certification, especially in the case when outside analysis is needed. Refer to USDA's experience in certifying third party labs as well as permittees.
- Provide inspector training on agricultural practices. Investigate associations that might be a valuable resource in this regard (NCGA on crop practices for corn). Consider coordination with USDA for this training, since USDA may have the required specialized training that EPA staff may lack. EPA may need to increase specialized training in the future.

RECAP OF MORNING REMEDIES AND RECOMMENDATIONS

WELCOME

Karen Heisler (EPA Region 9)

Welcome back. We are going to hear from representatives of our morning sessions reporting out their recommendations and remedies for each area. After that we will go to our panel sessions.

[The following comprise onsite reporting by two volunteers from each category. The comments represent how the volunteers individually or collectively characterized recommendations raised by each session and may or may not represent a complete summary of participants' remarks. Please see the appendix for notes on individual sessions.]

EUP APPLICATION AND DECISION PROCESS – CONTENT AND DATA REQUIREMENTS

[combined comments by volunteers from both sessions]

From our two sessions this morning, there are three main focus areas:

(1) PIP by their nature require more data than their chemical component, and more clarity and communication in terms of data needs; and the overriding need for flexibility while balancing consistency and rigor. Having said that, in the process there is no one-size-fits-all process.
(2) We should definitely move for standardization and harmonization between all government agencies, moving toward codification of requirements among agencies. Where there are overlaps we should take advantage of that and streamline the process for registrants and stakeholders. By bringing stakeholders early in the process, and soliciting their input, we will avoid conflict in the late stages.
(3) We need to increase transparency and oversight of the process. One important recommendation is a set of formalized requirements separate from chemicals, that is documented and capable of distribution.

Some of our more specific recommendations include:

- Need to document and reduce paperwork to expedite the process.
- Encourage the use of the e-submission process.
- Work on the predictability of the process with consistent timelines to facilitate meeting expectations.
- Develop administrative guidelines, maybe a PIP bluebook, document the roles and relevant points of contact information; perhaps adding pre-registration meetings with players.
- Communication with the state level and regions is not consistent nor adequate. Maybe there is a need for a website to go beyond FR releases.
- Need to address topics of threatened and endangered species.

REGULATORY TERMINOLOGY AND STANDARDS; DEFINITIONS AND CLEAR LANGUAGE
[volunteers reported separately for each session]

Session 1

- Although there are many EUP terms, EPA needs to prioritize for key issues, clarity and consistency and differentiate how the terms should be applied. In some cases a particular definition should be applied across the board for everyone, either in rule form, or if more flexibility is needed, as a guidance document. Recognizing that so many terms need addressed, the group focused on recommending a process to use. Comment and rulemaking will work but is time consuming and inflexible once adopted.
- Developing a guidance document seems more preferable. The agency could use public record notice, often used in the pesticide program and a handbook or booklet useful for folks in the PIP game.
- Much discussion centered around the EUP case-by-case permit process. It is critical for clarity, both for the permit holder and the agency to understand what has been agreed to. Defining what actually constitutes "the permit" may be critical, especially when going out in the field to effectively oversee EUP activity. A full set of documents constitutes the permit and is needed, including any that describe additional conditions, interpretation approval letters, etc

Again, there was a lot of coalescing around the view that, at least in the short-term, the agency would prioritize the terms that need clarification and standardization and develop definitions from inside and outside, inviting public comment through PR notice.

Session 2

Similar to the other session, given the large number of terms we identified, we broke them down into programmatic terms and into permit specific terms and discussed what would be the best way to reach consensus for terms in each category. There was a consensus that enforced clarity is needed for both those that are regulated and within EPA, especially staff in the field. In terms of process, we came up with these three options: (1) notice and rule rulemaking; (2) negotiated rule-making; and (3) enforcement discretion for definitional issues that are problematic, especially in such cases as forcing chemical derived terms to address PIPs.

CONTAINMENT AND CONFINEMENT – STANDARDS AND STRATEGIES TO ACHIEVE

[combined comments by presenters from both sessions]

Overlapping some of the discussion in the other sessions, it rapidly became apparent that we need clarity in using the terminology confinement and containment. The meeting ended with pointing out that EPA SAP suggested making a document addressing many of these issues and recommendations:

- Develop clear and consistent definitions for dealing with containment and confinement. One suggestion for doing this was through some type of interagency process that harmonizes through outside stakeholders and industry input, early on in the process.
- Refine standard operating procedures using the best available knowledge from SAP. We need to consolidate standards and other nice and controversial things such as what confinement entails; whether it be on a case-by-case basis or with standards, such as those based upon biosolids for USDA and EPA. When using the risk-based approach as the basis for developing standards, it needs to be done with guidance up front and accommodating consistency with other risk scenarios. Use statutorily defined terms and limitations when possible. Address the fact that an adulteration determination does not necessarily require removing the organism from the food chain.
- Address adverse effects that may occur in plots smaller than 10 acres, even if it is in a greenhouse. Facilities of the greenhouse have relevance to PIPS. The legal status maybe informed by that, and the containment issue. This is a reminder that EPA doesn't set standards for studies of less than 10 acres, but instead they are regulated through FFDCA.
- Develop and incorporate geographic and bioconfinement measures when appropriate. EPA already uses geographic confinement. In terms of bioconfinement for a plant that is genetically less able to spread their genes, EPA's flexibility allows for this. Where physical confinement wasn't enough, efficacy measurements should be used to determine appropriate uses. The NAS report on bioconfinement and its suggestions should be considered. Confinement should not be an afterthought, but rather up front. Use a redundancy of tools to address confinement issues. We need to encourage data generation from companies to reduce confinement distances, and develop more options and strategies.
- Engage research to determine the amount of monitoring we need and what measures we should use for effective confinement oversight. We need to consider evolving monitoring measuring methods, such as biomonitoring, perhaps working with applicants to develop and publish data on how well it is working. We need to avoid excessive standards, especially in proven low risk situations, recognizing that monitoring should be implemented in relationship to PIP risk potential. In certain circumstances, in relationship to the risk of PIP EUPs, there should be more monitoring and reporting taking into consideration endangered species. Some suggestions include having the agency commission research and have the company provide monitoring in cases where it might give EPA a reason to reduce standards. It is important to publish data on monitoring and how well it is working before the PIP is released.
- Ensure that endangered species consideration and evaluation is adequate with decisions involving confinement. EPA is already considering and reporting about endangered species, but the agency needs to clearly communicate to the public how they are doing this, how they consider the potential impact of endangered species, and implement target and nontarget risk assessment. Because it is not clear how consistently the EPA process is throughout the system or regions, there needs to be more transparent clarity.
- State and federal agencies need to collaborate on issues of confinement. EPA will be presenting some of this information at the upcoming SFIREG meeting.
- Emergent issues. The recent NRC report on bioconfinement is a valuable source. EPA needs to clearly identify emerging issues.

- Clarify the issue of adverse effect. Applicants think in terms of regulations, but APHIS has definitions that are broad. It may be important to consider some type of adverse effects as a reportable broader community issue pertaining to homeland security. We need clarity on FFDCA requirements in regard to adulteration of movement of products and state FIFRA issues on regulation of evaluation groups.

ENSURING EUPS CONDUCTED ACCORDING TO PERMIT CONDITIONS

[combined comments by presenters from both sessions]

There was a lot of agreement between the two groups and topics common between them.

- Ensure transparency for EUP inspection and enforcement and as guidance for registrants as to how inspections will take place. Most compliance inspections and procedures have been worked out—they need standardized when possible, clarified and published.
- Coordinate the federal agency framework to avoid redundancy and efficiency. There is no use reinventing the wheel within the framework.
- Develop an EUP manual containing standards and guidelines and point of contact information so that applicants have the ability to call to ask for compliance assistance when needed.
- Publicize inspection activities and violation rates—this only will lead to public confidence.
- Develop a certification program for researcher compliance activators, for those doing the work and checking the work. Create a liason coordination for standardization and development.
- Improve notification of release activities.
- Research and publish what state and federal regulators are doing to ensure permit conditions and compliance.
- Improve communication between researchers and regulators in letters of acknowledgement to go forward into the state stipulated terms of requirements.
- Standardized inspector training, in which inspectors are thoroughly trained in agronomic practices or have an agronomic background. We should look for same things across the country.
- Standardized sampling tools and techniques.
- An additional point of clarification—what will state inspectors be looking for in compliance; escape off site? Currently these types of inspections don't involve acreage, although the permit does.
- One point of clarification is the discussion of what state inspectors would be looking at for compliance. So would escape off site be looked for? Currently these kinds of inspections don't involve acreage. A permit involves acreage and that information may not be available. Limited resources don't allow states to carry around adequate GPS tools to locate these plots.

PANEL DISCUSSION: COORDINATION OF USDA AND EPA FIELD TESTING PROGRAMS

Following the day and a half of strong collaborative work on issues specific to PIP EUPs, the workshop offered three panel discussions on these topics:

- *Coordination of USDA and EPA field testing programs*
- *Balancing protection of proprietary information and public disclosure*
- *Compliance, why it matters and how it can be supported*

While the core of the workshop was designed to work toward identification of approaches and recommendations for EPA to consider, these three panel discussions were primarily for the purpose of illuminating perspectives around three compelling issues concerning PIPs that are associated with EUPs and that link to broader issues in PIPs or pesticides as a whole. The panels were not anticipated to yield specific recommendations, and were anticipated to be useful to more thoroughly understanding and characterizing future topics of consideration for all participants.

Phil Hutton (EPA)
EPA and USDA are now participating in a monthly pre-planned conference call where we discuss applications, their status and hang-ups. Scientists at EPA and USDA freely exchange information. When the same information has been submitted to both organizations, we compare notes. That's where we are right now.

Natalie L. Hubbard (DuPont)
I think it hopefully became clear yesterday that we operate under the coordinated framework. That is how most biotechnology products are regulated. USDA initially oversees the testing. Largely, what we've been talking about at this workshop, is what happens when a field release reaches 10 acres. Before scaling up to a 10-acre test, a lot of research has already been done on the PIP. Data has been developed on human health, ecotoxicology, ecological safety product characterization. As established by the coordinated framework, there is a lot of coordination between USDA and EPA and we work with FDA in consultation. As the number and diversity of traits increases you see more coordination, which is welcome. Regarding safety assessments from industry, we hear and see at the meetings and often get the question of whether we have gone to FDA, USDA? Hopefully the answer to those questions is yes.

Keith Pitts (Pew Initiative of Food and Biotechnology)
This workshop underscores the needs we have. Everyone should be commended. The coordination had drifted away a bit, but the agencies pulled it back together. The new things and products that keep emerging keep the agencies engaged in EUPs in general. We see a continuing need for USDA and EPA to keep cooperating. There are a couple of issues. The handoff of 10 acre presumably moves to another capture process within the coordinated framework. Is everything being captured consistently? We want to make sure EPA and APHIS are confident in this process and that there is agreement on containment. There is the presumption that a lot of this is handled in different ways. The flipside is double dipping, where we hit industry for separate data, which is something we want to avoid as well. While not necessarily raised as a problem, this is an obvious feature. Enforcement issues. We need to tidy up EPA regional monitoring. We discussed how EPA can get information out to the regions and provide clear guidelines. Historically, EPA has a narrow range of products but broad authority. APHIS is the flipside of a broad range of products and narrow authority. We need to address new and unique issues that are emerging.

EPA has an excellent opportunity to start up the process right now. They can start with a new PIP rule that provides as much clarity as possible. I don't know a lot about state interactions, but there is a federal reliance on states as partners. The sense I got was that the access states have to data is inconsistent and this may affect enforcement. What kind of data? Even within states, you have different agencies as well with different responsibilities. I suspect there is limited consultation between the states and EPA, but there are resources available to improve this. With APHIS, although they have contact with the states, there are basically no resources. Maybe this is something that needs to be explored. The Biotechnology Regulatory Service Compliance Division publishes what it finds and knowing the information is posted can be an effective tool.

Susan Koehler (USDA APHIS)
Everything Phil Hutton said is true. The commercialization level of biotechnology has historically been the focus of interagency coordination—and now especially since the Starlink incident—there was the impetus to coordinate more closely on the field trial level. We have met recently to discuss how to move forward on appropriate confinement for field trials and what type of information we could be sharing. We are sharing more information: when tolerance exemptions might be expired, what sorts of products are being field tested that are coming down the pipeline, looking for sexually compatible relatives. At APHIS, we are thinking about a scientific workshop to consider issues of confinement and to finetune guidelines. We don't have a day or venue but we are trying to plan it. We initiated coordinated inspections. APHIS is having an inspection workshop on February 23-24. We are discussing things to use on a regular basis, such as global positioning systems (GPS), laser range finders, what are the tools to share information that come out of inspections. We are looking to come to some agreement about sharing inspections and dividing up the workload. There is a big opportunity, as USDA revises regulations, to look at the lists identified here today. With terminology, looking at definitions in regulations and guiding documents, we can bring clarity and consistency to all federal agencies and internationally—EPA, FDA, CODEX, IPP.

DISCUSSION
[Ann Sorensen facilitated questions and answers among the participants emphasizing that the identity of workshop participants offering questions and/or comments during or after all the panel discussions would not be recorded or noted within the published proceedings]

Comment. While there is a lot of discussion going on at headquarters and within the agency, one of the things that is fairly clear is that once you go outside the Beltway, there is a lack of communication across states and between states and federal agencies. Part of it comes from so many different plans. With so many regions and so many people inspecting, it is easy to miscommunicate.

Q. If you are working in the biotechnology field, as a player, one who is likely to be inspected, where can I go for a coordinated message, get information, guidance that is usable? What is the initial information you need? When someone really comes from ground zero, and they go to look for information, unless they know someone else, I'm not sure the message of where you need to go to get what you need to get is out there.

A. We need to update the APHIS website. We have good intentions, and then you run into IT issues: when to post and the like. We apologize for not keeping our website up to date.

Q. One of the issues is not so much coordination but consistency for these products being experimented on for field testing. There is a need for improvement. An example might be, from the public's point of view, that there is a site that borders my property and they're growing this crop but the notifications and permit conditions may or may not be made public. If less than 10 acres, I go to USDA but if there is more than 10 acres, I need to go to EPA. Have scientists really told us there is a difference in risk between nine and 10 acre plots? We want to see that type of consistency. If you have the same PIP, but it is regulated inconsistently, I don't think it leaves the public confident in the oversight and inspection system. I think that, looking from the public's point of view, the agency needs to work towards better coordination and consistency about what is being done. The National Academy of Sciences report states that with environmental assessments the USDA and EPA are doing things differently, leaving some gaps. So the question is, does one completely defer to EPA or go to another agency? I commend them for their case-by-case approach and transparency, but with the overlapping jurisdictions, the public begins to wonder what this all means.

A. Some of these differences come from the statutes we work under. Whether or not there is a FFDCA component, for example, makes a difference. The theme of consistency has been echoed throughout this meeting.

Q. One comment and one question. If in fact compliance appears to be lacking, it may be because the EUPs are not drafted appropriately, the EUP language itself may limit the inspection tools available for sufficient inspection. The question I have is if in fact you want to coordinate inspection activities, will you contemplate having USDA or state folks do the inspection? You have a relationship between EPA and the states. There's money limitations, grant rights and federal credentials involved. In terms of actually having USDA or a state person do the job, I don't know how it practically would work. I can't crack that.

A (EPA). Let me speak to that. There is the potential to set up a certification program for state regulatory people to go out and pay them an hourly rate to do that. I assume if that were done, we would give them the authority. I'm not a lawyer, but we're looking into making some sort of arrangement with Bureau of Rural Sciences (BRS).

A (USDA). I don't know how far along you are in these discussion. But there is state primacy. APHIS is looking at the states. You put two and two together.

A (EPA) The impediments we are going to run into will be credentialing, how we fund this, and our grant guidance. These are practical issues; I don't know if any of them are going to be "drop dead" issues. We will push forward inspections with EUPs and make sure there are good discussions and follow ups. We will build on what we've been discussing here in last few days.

Q. A question asked of me by an academic researcher, could you [EPA and USDA] have a shared website in order to create a common point of entry for users? Maybe a third party website? And would it look at experimental permitting? If that would ever come up for you guys?

A (USDA) We both have our own web police. It would probably be too hard to do that. There are places people go to find out information in general. Maybe they would post that information where we wouldn't have to worry about it.

A (EPA) There used to be a site that combined the information. Not on a specific site currently, but in the past there was an effort to provide a central place.

A (USDA) We have links to each other's sites, but they're buried. At our homepage, there is a box for FDA and EPA which links directly to EPA's page with PIPs on it. This is our unified website page with the biosafety protocol. This website will have information on all approvals. I don't think it would include all PIPs. I don't know if there is any way to find a particular APHIS permit. This has always been my challenge.

We deal with two different tracks. The EUP might lap over both the permit and notification tracks. It is a bit of a challenge to coordinate where we are with the two systems. The terms mean real things to us. An example of how difficult it would be is to try to link any permanent activity to another agency. Resolving these challenges is on the agenda for this coordinated framework group. There is one simple way to do it if EPA asks the applicant to include information as to whether the applied organism/article is under any other permit, then it can be captured. The thing is, we have to at least explain it up front. We always give what the regulatory status is with these agencies.

Q. Do you know who will be trained at the USDA workshop at the end of February? Will there be any state people?

A. (USDA) I know we will have some people from Canadian Food Inspection Agency. We might want to see what we can get in with regards to how we carry out inspections. I think there will be some state inspectors.

PANEL DISCUSSION: BALANCING PROTECTION OF PROPRIETARY INFORMATION AND PUBLIC DISCLOSURE

Stanley H. Abramson (Arent Fox)
I'd like to make some brief introductory remarks. The federal law provides explicit protection for confidential business information (CBI). The Freedom of Information Act protects trades secrets. Pesticide statutes provide the same protection, including PIPs. Both FIFRA and the Federal Food, Drug and Cosmetic Act (FFDCA) make it a criminal offense to disclose trade secrets. A balance is struck at least in case of FFDCA and FIFRA. This balance is more of a policy nature that executive branch agencies know and follow.

The CBI typically claimed falls into four general categories: 1) the first is gene and gene product descriptions, 2) the second is crop location information—it is obvious that GPS coordinates the names of growers and specific personal information could lead quickly to the field trial location. 3) Third is proprietary NDAC know-how. A lot of time, effort and money is spent in complying with permit requirements that they don't want to share with their competitors. 4) Finally, there are the characteristics of a particular experimental program that could reveal the stage and scale of the program. For example, harvest volume could telegraph where they were in development. The EPA regulations require the submitter to substantiate claims at time made. Specifically for PIPs, EPA requires the submitter to respect confidentiality of information. You have to be sure you don't go off and provide information that reveals the information protected by CBI. Balancing comes when you consider that Congress has stipulated that EPA make available all information on health and safety tests and any other concerns of the effects of pesticides on humans and animals or effects in the environment. Once a pesticide is registered, it becomes available to the public. There is an exception to that, which shows how Congress balances. While a public citizen or pubic interest group could get information, a foreign or multinational organization could not get access. In order to put freedom of information into effect, you have to sign a multinational affirmation. What Congress was trying to do was prevent disclosure of information to competitors. While they wouldn't submit your data under your name, it would disclose valuable information that would give them an advantage they should not be able to have. This is how far Congress went with amendments to FIFRA in 1970s in order to balance transparency with the competitive process.

Peter Jenkins (Center for Food Safety)
As attorney for a not-for-profit group, I do a number of things at the Center for Food Safety—advocacy work and litigation. I recently sued FDA for failure to the glow fish, the genetically engineered fish that glows and is now available at some pet stores. I'm litigating against USDA on turf grasses and considering biopharmaceutical crops and field test regulations. What we've focused on there was the lack of compliance with NEPA and Endangered Species Act (ESA) laws, and we have been stymied by a lot of confidential business information (CBI) and Freedom of Information Act (FOIA) issues. You noticed we haven't sued EPA yet. The categories of confidential business information (CBI) that Stan listed are reasonably consistent with what we encounter. The question is whether the interpretation is justifiably treated as CBI. This is a bone of contention.

There is not a place in FIFRA regulations as to the confidential classification of field test locations or personal identification information. There is a basic problem of balancing CBI and transparency. We want to see what is happening. If we can't get environment information that outside folks can review, it doesn't seem to be in the public interest. We try to get agencies to disclose more public information: What is being planted? Where? How big? This is not too much to ask, is it? If you don't have these things, you can't assess it. It allows for insulating these things from review and you can't judge how well the regulatory system is working. We found that extent of CBI hampers external review. The NAS committee found it difficult to gather information for their report because of CBI and reiterate their concerns on page 51 in the NAS bioconfinement report.

There is a need to coordinate approaches across agencies. EPA's approach, from reviewing the regulations, has a modern, up-to-date approach and specific CBI that puts the burden of proof on the company. This generally sounds good to me. I'm not an expert on it. EPA needs to coordinate with APHIS. The agency that I have the most experience with is APHIS. Here are the four problems and pitfalls to avoid when dealing with them:

1. Stale CBI claims. Maybe they were valid at time they were made, but subsequent disclosure puts these claims into the public domain. The APHIS website has a number of claims of CBI that are no longer valid. They have not cleansed the site of old CBI claims. For instance, there was a plant-made pharmaceuticals (PMP) field test in Hawaii by DOW, a herpes simplex virus grown in corn. DOW got the patent for it and once patent is issued, they can't claim it as CBI any more. We have to battle it out in court.
2. Field test locations are not CBI. It appears that in about 2,000 permits, APHIS allowed this claim as CBI. In response, I would have to say this is not based on CBI but on concerns about vandalism by ecoterrorists. Therefore, in response to these concerns, officials allowed them to be claimed as CBI. I'm not denigrating those concerns. It should be a policy consideration. But they should not claim them as CBI.
3. Emergency release. In the case of containment violations, there should be some opportunities to understand the nature of what was previously CBI, especially if it affects the food supply. The Progeny case was living example of that.
4. Giving applicants repeated opportunities to claim CBI classification requests. This leads to terrible delays in the FOIA process.

The solution in the field test context is to modernize the approach. APHIS based theirs upon 1985 rules and adopted them long before complex biotech products were created or the potential for field release was contemplated.

DISCUSSION

[Ann Sorensen facilitated questions and answers among the participants emphasizing that the identity of workshop participants offering questions and/or comments during or after all the panel discussions would not be recorded or noted within the published proceedings]

Q. If you recommend the agency pursue another policy concerning site location, I've seen them shot down in court.

A. This is a good public policy issue. There are pros and cons for that issue. Vandalism concerns and business competition concerns are examples. But you have to consider the public interest as well. There are a lot of reasons for that. How would that happen? APHIS and EPA should place the issue out there and invite public comment. It is not in statute or in the trade relations act. It is within the EPA and APHIS agency's discretion. Lets not call filed site location CBI when it is clearly not.

A. Actually I'm not sure that is the case, putting aside the ecoterrorism issue, which is a serious case. Industrial espionage, which is also a serious issue, would allow domestic or foreign competitors to observe and take samples from disclosed sites and makes companies very vulnerable from that point of view. The agencies legitimately respect those claims. Too, the whole point of that is to protect the rights of the pioneer developers. The types of claims made for CBI are so broad and diverse. I'm not sure many agencies promulgated regulations as to what should or should not be awarded CBI. EPA assesses CBI on a claim-by-claim basis. Site location is one claim that is well established for pesticide information. This is separate from the terrorism and vandalism perspective. You don't want competitors to gain from your research. In my mind, it is hard to separate the two.

Q. I've heard some working rules stated by APHIS, in terms of whether a gene can be classified as CBI. If the gene has been publicized, then it should not be allowed as a CBI claim. Perhaps someone could respond to equivalent standards. The CBI does generate a lot of FOIA delays. There is constant going back to companies. The public sense is that there is very little public input and access to this information. Finally, some specific things on the EPA front. The background documents claiming CBI status for documents, there are two, data matrix agency internal use and public file copies. Why would you have two different versions?

A. Let me just comment a bit on the comment. The FOIA process is not worth much for public access to information. It takes two years for GRAS. For almost all genetically engineered crops getting NEPA exclusion, one of the answers is for the agency to do more environmental assessment to give public a greater sense of environmental impact assessment. It appears APHIS will revamp regulations and bring them into the modern age and overlap with PIP issues. I expect it will be more focused on biopharmaceutical issues. There is a need to revisit its approach to NEPA and categorical exclusions. I wouldn't want to leave the impression that information is not available to the public. There is an awful lot of information. I noted for registered PIPs, it is a simple matter of requesting information from EPA as long as you are willing to execute a multinational form. Independent of the EPA process, there is a great deal of health and environmental information. Actually there is an excellent compendium on the agbios website (www.agbios.org). Click on their bibliography. There is the issue of fairness to companies. After going through the process can we say give us more? Look at what's out there, it's a lot.

A. Every risk assessment we do is on our website at EPA. To answer the question, the actual genetic sequence is CBI. The gene is not but how it is linked is. The data matrix is for both. PR notice explains why there are two copies required, two copies are sent to the agency: one for docket and one for the confidential jacket. This is general to pesticides, overall, not just PIPs. The notice to the registrant label is kept confidential. We try to get information out to the public. The data matrix was put in place with both a public and EPA version because industry is policing itself to make sure companies citing other companies are reimbursing each other adequately. There is the file anyone in the public can go to, but you want to make sure that there are adequate citations as afar as CBI goes. With the label and data matrix, we're really trying to be open with the public. If I recall correctly in this case, in both the label and data matrix they were available to the public and reclassified as Part 174 of 40 CFR. Now with PIPs, companies must substantiate their claim of confidentiality before their application is complete.

Q. One comment on public information beyond the agencies. A lot of information gets to the agency after registration has occurred. It is not helpful to the public. Previous cases are informative for predicting general approximation of overall risk assessment. Unless there is current data on that crop in the public domain, it can't be relied on to inform the public if it is safe or unsafe. On a case-by-case basis it is not particularly useful.

It is useful to look at how EPA looked at the reassessment process for Bt crops. As part of approval, registrants had to submit data to EPA and EPA would judge whether to renew. This went on for several years. During this time, the agency went through an unprecedented level of public involvement. There is a huge amount of information available to explain the Bt process and the risks. There were numerous opportunities to get involved and participate. Despite this, the point is that Bt crops are the most controversial and the agency went through a lot to assess the risks.

PANEL DISCUSSION: COMPLIANCE, WHY IT MATTERS AND HOW IT CAN BE SUPPORTED

INTRODUCTION

Carl Eichewald (EPA, Office of Enforcement and Compliance Assurance, Office of Regulatory Enforcement (OECA ORE))

We do have some serious and real issues to talk about with compliance. With EUPs in Region 9 in Hawaii, they are litigating and solving cases. There are real cases out there to make sure the experimental activities are carried out in the right way. This is an opportunity to gather information and hear other peoples' views on what EPA and the rest of the government should be doing to assure the proper level of compliance with EUPs.

Morven A. Mclean (AgBios)

I work with AgBios, in compliance education. I am the sole Canadian here. We enforce biotechnology regulations through our work and with an education manual. This program in Canada has been well received by the public and companies over the past four years. We have conferred on trials in the United States since 1987. Ongoing management is the key. There has been ongoing improvement with these trials, building up confidence in this technology. This is important as there has been lot of discussion. To ensure compliance with field trials, there needs to be a predictable regulatory environment so they can meet the regulatory requirements of what the trial is actually growing, making sure the machinery is kept on site and maintaining reproductive isolation. There are different methods to achieve confinement such as spatial confinement, temporal confinement, detasseling and bagging. Significant parts of confinement involve transport of material, storage, compliance aspects of retained harvests and the post harvest period. These are substantive. Also other essential elements include monitoring, inspection and reporting. Are there regulatory personnel at the state level and at the federal level? If there is storage post-program, is it in compliance for the duration of the program? You need to refer to successes when developing programs for the first time. There are two objectives in educating the public as regards practical information. This includes the tracking and verification of harvested materials which will be open to all parties. In a classroom setting, we cover broad topic areas, including the approval process, guidance for management practices and compliance in the management process. We hope to have more details by the end of 2004.

Gregory Jaffe (Center for Science in the Public Interest)

My thoughts for a few minutes on why it matters what EPA and other agencies ought to be doing. They are actually doing more in-house in managing trials with EUPs. There are three challenges for EPA:

1) Protect human health and the environment. EPA has been given this mandate by Congress and the American public. They set conditions. If we don't have oversight, we risk public harm. They must carry out that part of the mandate.
2) Ensure the integrity of EPA's regulatory system. This was put in place to protect the public. In order to have a system with integrity, we must ensure laws are carried out. EPA has done a good job of issuing EUPs and the final link is to ensure permit conditions are carried out. There needs to be oversight of compliance inspections etc. to be put in practice.
3) Instill public confidence in the governmental regulatory system and in agricultural biotechnology in general as a new technology.

The public wants to know their health is being protected, that it is a system that follows through and carries through, that EPA is an independent regulator that makes sure conditions are put in place. The good news is that the public has confidence in EPA in general, that they act as a watchdog to make sure compliance is occurring. They are skittish with new technologies. Hopefully EPA data will show companies are complying.

What is the oversight record to date? In close to 10 years, there have not been many EPA inspections. We are aware of a couple in Hawaii, five in the region in 2003. Inspections in 2002 led to fines, inspections in 2003 were generally clean. It is not clear that there were inspections carried out before that time. We would like to make sure more inspections are carried out while technology in its infancy. One of reasons is to make sure that we are not seeing continuing violations. (1) First and foremost, we must make sure permits are clear and unambiguous, that there is only one interpretation. There is not even consensus among EPA staff. We need clarity. One of the results of this workshop is to get it. (2) We need oversight within the industry as a deterrent. We need some level of oversight. 3) The third challenge is the need to do some sort of testing. What is EPA trying to do with imposed confinement? Are we meeting those goals? There are other ideas: (4) auditing the permits after the fact to see if permit conditions have been complied with; and finally (5) a certification and training program to make sure those doing the field test out there understand conditions imposed on them and that they have the credentials to do that.

Terry Mitchell (Texas Department of Agriculture)
In Texas, we don't have a state EUP process, we simply use what EPA has to regulate. Texas monitors field use, especially PIPs, and we inspect reports of monitoring. This is reported in writing to EPA. Industry and companies, in my mind, have been very cooperative. We get the EUP locations from the companies doing them. They are scattered around the state in general. We do not register biotechnology products. Our monitoring consists of compliance with EPA requirements. We make sure companies comply with the permit. The comments I have, and I've been with TDA for 26 some years, first we don't get a lot of EUPs in terms of our workload, at least in our state. In one particular instance, the participant gave us extremely short notice. We've had only a few non-compliance situations. The participant as a company has been very cooperative in these situations.

DISCUSSION
[Ann Sorensen facilitated questions and answers among the participants emphasizing that the identity of workshop participants offering questions and/or comments during or after all the panel discussions would not be recorded or noted within the published proceedings]

Q. One of questions I've had is what more can companies do to get compliance by cooperators—is there more that can be done?

A. We haven't had problems with cooperators. There are more problems with participants than with cooperators.

Q. Can't you make those people employees so you don't have that distinction. EPA has started to do that with pharmaceutical plants for more control over the company. In other words, develop a long-term contractual relationship, with investment returns. The key to the relationship is compliance training.

A. Obviously training cooperators is taken very seriously.

A. (APHIS) I'd like to make a clarification. USDA does not require people who run field tests to be employees. One thing to clarify from yesterday, cooperators are operators of the land, not the researcher. The registrant manages the work. As to getting control of cooperators, your question brings some turmoil. EUPs move into the larger realm and with terminology confusion.

Q. Another question I had. Texas has the most robust EUP program of the states. EUP oversight is, under the FIFRA scheme, a state responsibility and is part of state programs. Do you have the data you need to carry out oversight?

A. Sometimes we get EUPs that don't have the cooperators location. Some of these applications take a while and we need a little bit of common sense on these things. It concerns finding the cooperator's name and street address. If it is not on the application we can get them.

Q. I have an issue with the statement that EUPs are under state oversight. I know from FOIA and looking at Section 12 explaining the terms and conditions of that experiment, we would have to accept that product as a pesticide. I would say this is a state privacy issue and would say they have a lot to do to make sure state laws are in conformance.

A. Our authorization process looks at four different parts of the state program. One of those is enforcement of EUP program. I don't know if there is any change. I think if they define pesticides like we do, then that's what triggers it. Most states define it the same way.

Q. From a state perspective, regulation of PIPs is schizophrenic. Section 5 isn't a Section 3, there is a label on the seeds. The schizophrenia is that states are not entirely clear about their role under Section 3 under gene products. There is a kind of confusion over the role of states with EUPs and that is why states might be stepping back from taking a primary role in the process. That is why Hawaii invited EPA Region 9 into their state.

Q. I have an issue from the public's point of view. You need basic information about how many EUPs and how many inspections are being done. It would not take much time to separate them out if there is a low rate of inspections. You can have laws and regulations, but if there is no enforcement or checking up, you need some basic ground rules. How many per year? This way we could see if the agency is getting better or hardly any inspections are being made. Someone in our group said that in past years there has never been an inspection of EUP. This would help with transparency.

A. First of all, EUPs are issued for a whole lot of states. There might be one EUP for 25 states. How do we count that to give the information? The information isn't that clear. For each EUP, you can ask how many sites and what is the inspection rate for those sites. If you have one EUP and inspected it once a year, that's one number. If you had 100 sites, the inspection number is different and a bit misleading. This agency does always issue it as a Federal Register notice, EUPs in what states and how many acres there are.

Q. Does the Federal Registry break it down?

A. They don't tell us the locations.

Q. This might be something that needs to go to the states.

A. They're doing far fewer EUPs.

Q. What about tolerances with EUPs?

A. There are five priorities and BPPD does not do that.

Q. This is going to be a bit more complicated.

A. I understand why you want this to be a bit more transparent.

Q. In regard to states doing more inspections on EUPs, there are continually developing and different guidelines between states and shifting priorities. My state agency deals with six federal agencies. The priorities of agencies should be if the agency wants more inspections the money needs to go out to the states.

A. Absolutely. We know everyone is operating with a limited amount of resources. Most states are dealing with shrinking resources. If you do one thing you're not doing something else. When we consider PIPs, what is the right approach? What are we going to ask our state partners?

Q. The inspection protocols and any testing that is done needs to have very clear defined goals for confinement and containment. It seems that this is the main goal. Is the biotech trait getting out beyond the test plot? Is this a regular part of the inspection protocol?

Q. With something like a PIP, we will be out there at harvest time and watch harvest and material being put into a confined area. We don't test to see if cross pollination occurred.

Q. Two different questions: when EPA inspects EUPs, is it mechanical? And do you have proper barriers and buffers? The second question is, are the things in the EUPs working to ensure containment as a regulatory issue as opposed to enforcement issue?

A. With EPA enforcement actions, we look at each case on a case-by-case basis. In this case, we work with a company or grower to figure out the best approach. We can reach an agreement but have to consider facts of the case and what is the best approach. This is a good way to deal with the issues. It happens with many issues.

A. I think you addressed most of the issue. When contemplating monitoring, you enter a whole new realm of methodology required. State regulators are not ready for the different level of abilities that are required to do this.

Q. Is it possible to consider routine monitoring of the sites?

A. When we discuss this, the tools by which they are monitoring are not necessarily working and might not be keeping pace with the technology.

Comment. A point of clarification. Each EUPs is different. Not all EUPs require containment or confinement.

WORKSHOP SUMMARY AND NEXT STEPS

Ann Sorensen (American Farmland Trust)
We've been honored to be part of such a great workshop and I hope it has met your expectations and needs. It has provided us a chance to learn and become aware of a variety of valuable perspectives. I commend all of your efforts and the contributions that each participant has made. I'd like to especially thank my staff—Teresa Bullock for handling the arrangements for the workshop and Anita Zurbrugg, Bryan Petrucci and Tony Wohler along with Patrick Stewart from Arkansas State University for being our scribes. We will try to turn around the proceedings as rapidly as possible. We are going to close out the day with some invited comments about the workshop.

PROCESS BY WHICH EPA WILL MOVE FORWARD; FUTURE CHALLENGES AND OPPORTUNITIES

[The following comments represent some of the major stakeholders presenting at the workshop]

L. Lareesa Wolfenbarger (University of Nebraska)
We are at the beginning of a process that will require modifications as the breadth of transgenic organisms and transgenic traits increases and the challenge is ahead of us. Fortunately, our regulatory and evaluative system can be adapted to meet these challenges as long as strategies and requirements for minimizing environmental or human health risk are developed to encompass the future of transgenic organisms and not the past.

Doug Gurian-Sherman (Agricultural Biotchnology Consultant)
This kind of workshop is valuable for launching us into the process of identifying how the EUP process can be revised to better protect public safety, but it is also critical that there is adequate follow-up by EPA and USDA. We need to clarify many areas of the system, in defining responsibilities, and developing clear standards and guidelines. There are several next steps and work that need to be done. Especially important from the risk perspective is to examine the importance of gene flow. EUPs and field trials are approved on the assumption of limited exposure due to small area and short duration. Gene flow to wild relatives or crop contamination subverts that assumption. Recent studies showing that gene flow is pervasive tell us that more must be done to prevent or greatly reduce it. We need to develop clear methodologies to determine where we need containment and confinement, develop methods to prevent gene flow, and follow up with appropriate monitoring.

Susan Koehler (USDA APHIS)
I thought this workshop was well organized and implemented. It did a good job of focusing on coming up with outcomes and, in the process, surfaced valuable information.
This workshop worked because the audience felt comfortable in pointing out areas and ideas for USDA and EPA coordination. From my perspective, the challenges are to:

- Clarify and articulate in all parts of the process, especially in terminology and methods
- To beef-up and coordinate systems of inspections to ensure compliance
- To make sure there is timely sharing of appropriate information
- To increase transparency throughout the agencies

USDA's commitment to revising its regulations offers an opportunity to reexamine regulatory systems and to incorporate these changes. We are looking forward to receiving the report from these proceedings and will keep the ideas on our radar screen.

Michael Phillips (Biotechnology Industry Association)
The folks from EPA and USDA have done a good job summarizing for us. Industry appreciates the agency hosting this workshop. We have done a lot of work here but there is still a lot of work to do. We need to increase our interaction with industries at the beginning stages of developing new technologies. These technologies will continue to evolve and the regulatory policy will need to evolve with it in and between the agencies. Issues that are especially critical to industry, CBI and compliance and others, all are areas we are committed to work on. We can improve. We are human. As long as open communication exists, we can continue to work together as we go forward.

Janet Anderson (EPA OPP BPPD)
The planning for this workshop was a joint effort. We spent a lot of time developing the agenda, involving people across the United States, especially EPA Regions 4, 5, 8 and 9 and all offices to some degree. We have a FACA problem. This workshop can be the only meeting we can have on this topic due to federal regulations.

Karen deserves a round of applause. This workshop has exceeded our wildest dreams.

I have been working as manager on this topic for 10 years. It is still obvious that there are areas that lack adequate communication. This experience shows us the need for continued efforts to improve communication. The proceedings will be critical in reminding us what we need to do. We will put them up on the web and then notify participants.

This workshop has emphasized the need for coordination. Information from this workshop provides a good beginning to creating a useful bulletin for EUP PIPs. We need to look at what we have gained and how we can move forward, especially in EUP submissions, public interaction and in our work with academics and researchers.

Thank you for coming and participating.