INITIAL ENVIRONMENTAL EXAMINATION
and/or
REQUEST FOR CATEGORICAL EXCLUSION

PROGRAM/ACTIVITY DATA

Program/Project Title: Integrated Pest Management Collaborative Research Support Program (IPM CRSP) Eastern Europe Program
Program/Project Number: EPP-A-00-04-00016-00
Project Country(ies): Albania, Moldova, Ukraine
Funding Period: 9/30/04 – 9/30/09 with expected 5 year extension to 9/30/14
Life of Activity Funding: $87,500/year.
   Albania host country component – approximately $25,000/year;
   Moldova host country component – approximately $15,000/year;
   Ukraine program component – approximately $33,000/year.

IEE Amendment  Yes _x__ No___  If yes, date of original IEE: 5/5/2004

IEE Prepared by:__ Management Entity of the Integrated Pest Management Collaborative Research Support Program (IPM CRSP) on behalf of Dr. Doug Pfeiffer, Eastern Europe Program Leader  Date: May 9, 2008

ENVIRONMENTAL ACTION RECOMMENDED(check all that apply):

Categorical Exclusion_________  Negative Determination ________________
Positive Determination_________  Negative Determination w/ Conditions _X____
Deferral______________

SUMMARY OF FINDINGS AND RECOMMENDED THRESHOLD DECISION

A categorical exclusion was made on May 5, 2004 covering EGAT activities related to Strategic Objective 9 “Strengthen Agriculture’s Contribution to Broad-based Economic Growth, Better Health, and Effective Natural Resources Management”. The activities of the IPM CRSP fall under SO9 as long as plant protection products are not used. Pursuant to the SO9 PERSUAP, research plans that involve the use of pesticides (defined broadly) are submitted to the USAID Environment Officer in the form of an Initial Environmental Examination (IEE). Research using pesticides has been determined necessary in the course of implementing IPM CRSP activities.

Finding effective, economical, and safer alternatives to currently used pesticides is done through collaborative research with host country institutions. Most of the IPM CRSP activities do not involve pesticides. Those activities that do involve pesticides often involve comparing newer, safer pesticides with farmer common practice. In the countries where the IPM CRSP works, pesticides in common use are often older, more toxic chemistry than newer products not as
widely known. Such experiments can involve comparing biological control products such as microbial bio-pesticides. Research in farmers’ fields often involves monitoring farmers agreeing to reduce the number of their pesticide applications during a growing season to test the ability of fewer applications to achieve equivalent levels of control. In such cases the IPM CRSP does not purchase pesticides. Because of this context for the use of pesticides, a negative determination with conditions (following the procedures outlined in the attached PERSUAP) is recommended.

Pursuant to USAID authority under 22 CFR 216, the EGAT Agriculture Office SO qualified for categorical exclusions under Section 216.2(c)(2)(i), education, technical assistance, or training programs except to the extent such programs include activities directly affecting the environment (such as construction of facilities, etc.); Section 216.2(c)(2)(ii), controlled experimentation exclusively for the purpose of research and field evaluation which are confined to small areas and carefully monitored; Section 216.2(c)(2)(iii), analyses, studies, academic or research workshops and meetings; Section 216.2(c)(2)(v), document and information transfers; and Section 216.2(c)(2)(vii), institutional building grants to research and education institutions in the United States such as those provided for under section 122(d) and title XII of chapter 2 of part I of the FAA (22 USCA 2151 p. (b) 22220a. (1979)).

In the event that any activity under the SO has an adverse effect on the environment, that activity will require further environmental review and final concurrence by the EGAT Bureau Environment Officer (BEO/EGAT) and may result in a negative determination with conditions per 22 CFR 216.3(a)(2)(iii). This is the purpose of this amendment and recommendation of a negative determination with conditions.

Recommended By: ______signed______________________________ May 13, 2008
Office Director

Concurrence: ________________________________________________ Date
Joyce A. Jatko
EGAT Bureau Environmental Officer

Approved: ______
Disapproved: ______

Clearances:

___________signed______________________________ May 13, 2008
Robert C. Hedlund, CTO, IPM CRSP

Date
Integrated Pest Management Collaborative Research Support Program (IPM CRSP)

Pesticide Evaluation Review and Safe Use Action Plan (PERSUAP) for the IPM CRSP Eastern Europe Program

Submitted by the Management Entity of the Integrated Pest Management Collaborative Research Support Program (IPM CRSP)

on behalf of
Dr. Doug Pfeiffer, Eastern Europe Program Leader

9 May 2008

Virginia Polytechnic Institute & State University (Virginia Tech)

USAID/EGAT Leader with Associate Agreement No. EPP-A-00-04-00016-00

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Table of Contents

I. Pesticide Evaluation Review .................................................................7
   A. Introduction .............................................................................................. 7
   B. Program Description .................................................................................. 9
   C. Eastern European Program Activities Requiring Pesticide Use .................. 11
   D. Expected Benefits and Beneficiaries .......................................................... 12
   E. Pesticide Characteristic Profiles ................................................................. 12

II. Safe Use Action Plan .............................................................................62
   A. Ensuring Safe Use ...................................................................................... 62
   B. National Pesticide Regulation ................................................................. 62

Annex I - Albania Plant Protection Service Bill
Report and Project Contacts

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I. Pesticide Evaluation Review

A. Introduction

Activity Title: Integrated Pest Management of Specialty Crops in Eastern Europe

Country/Region: IPM Eastern Europe Program in Albania, Moldova, and Ukraine

Award amount: $87,500/year. Albania host country component – approximately $25,000/year; Moldova host country component – approximately $15,000/year; Ukraine program component – approximately $33,000/year.

The IPM CRSP and USAID Strategic Objectives

The Integrated Pest Management Collaborative Research Support Program (IPM CRSP) is an initiative of USAID’s Bureau of Economic Growth, Agriculture, and Trade (USAID/EGAT). The overall purpose of the IPM CRSP is to develop and implement a replicable approach to IPM that will help reduce: (a) agricultural losses due to pests, (b) damage to natural ecosystems including loss of biodiversity, and (c) pollution and contamination of food and water supplies. By combining strong regional IPM programs with work on critical global cross-cutting themes, the goals of the IPM CRSP are to measurably reduce crop and animal losses due to pests, increase farmer income, reduce pesticide use, reduce residues on export crops, improve IPM research and education program capabilities, improve ability to monitor pests, and increase the ability of women in IPM decision making and program design. By reaching these goals, the results of the IPM CRSP program was designed to contribute to the Strategic Objective of the Land Resources Management Team (LRMT) of EGAT/NRM to increase the capacity of USAID and its partners to advance land resource management practices that provide long term social, economic, and environmental benefits. In 2007, the IPM CRSP was moved to EGAT’s Agriculture Technology Generation Outreach Team (EGAT/ATGO). The IPM CRSP complements the objectives of ATGO: providing assistance on the improvement of yields in crops and livestock systems for reducing production costs, increasing profits, improving nutritional quality or other consumer benefits, reducing variability in output such as those due to weather and pest attacks.

The goals of the IPM CRSP are to: 1) reduce crop and animal losses due to pests; 2) increase farmer income; 3) reduce pesticide use and substitute safer pesticides when non-pesticide alternatives cannot be found; 4) reduce pesticide residues on food; 5) improve IPM research and education program capabilities; 6) improve ability to monitor pests; and 7) increase the involvement of women in IPM decision making and program design.
The IPM CRSP has four program objectives:

1. Advance IPM science, and develop IPM technologies, information, and systems for sound land resource management;
2. Improve IPM communication and education, and the ability of beneficial practitioners to manage knowledge, resulting in widespread adaptation, adoption, and impact of ecologically-based IPM technologies, practices and systems;
3. Provide information and capacity building to reform and strengthen policies and local/national institutions that influence pest management; and
4. Develop and integrate sustainable resource-based local enterprises into national regional and global markets.

A categorical exclusion was made on May 5, 2004 covering EGAT activities related to Strategic Objective 9 “Strengthen Agriculture’s Contribution to Broad-based Economic Growth, Better Health, and Effective Natural Resources Management”. The activities of the IPM CRSP fall under SO9 as long as plant protection products are not used. Pursuant to the SO9 PERSUAP, research plans that involve the use of pesticides (defined broadly) are submitted to the USAID Environment Officer in the form of an Initial Environmental Examination (IEE). Research using pesticides has been determined necessary in the course of implementing IPM CRSP activities in the program described below.

Integrated Pest Management is an approach to pest management in which economically rational treatment decisions are made from among environmentally sound options. Pesticides are used only when necessary, in as small a quantity as possible, and in a manner that poses the least risk to humans and the environment. IPM also considers, as much as is practical, the relationship of a pest with other crops and the relationship of a farmer’s different crops to an overall pest management strategy, not a single pest on a single crop. Identifying economic alternatives to pesticides is a fundamental activity of each regional program.

Finding effective, economical, and safer alternatives to currently used pesticides is done through collaborative research with host country institutions. Most of the IPM CRSP activities do not involve pesticides. Those activities that do involve pesticides often involve comparing newer, safer pesticides with farmer common practice. In the countries where the IPM CRSP works, pesticides in common use are often older, more toxic chemistry than newer products not as widely known. Such experiments can involve comparing biological control products such as microbial biopesticides. Research in farmers’ fields often involves monitoring farmers agreeing to reduce the number of their pesticide applications during a growing season to test the ability of fewer applications to achieve equivalent levels of control. In such cases the IPM CRSP does not purchase pesticides. For the majority of pesticide research conducted by the IPM CRSP, experiments are conducted with small quantities of products (<5L on a maximum of 10 ha).
Once improved IPM packages are developed by the IPM CRSP, the project undertakes technology transfer activities to promote farmer adoption.

**B. Program Description**

Institutional Partners in IPM CRSP Eastern European (EE) Regional Program are:
- **Albania** - Plant Protection Institute, Agricultural University of Tirana
- **Moldova** - Institute for Plant Protection and Ecological Agriculture
- **Ukraine** - Lviv Oblast Plant Protection Station, Odesa Oblast Plant Protection Station, Dnipropetrovsk State Agrarian University

Integrated Pest Management (IPM) in Eastern Europe has faced a variety of obstacles. Some are related to lack of economic resources. While this problem is shared by many less developed countries, it is a severe factor in many former Soviet block countries because of their economic collapse of the 1990s. These countries are now among the poorest in the world. An additional problem, more specific to former Communist countries, results from the former system of collectivized agriculture. This system resulted in several generations of farmers who were not allowed to be involved in decision-making, and they are now only beginning to exercise independent decision-making in day-to-day farm activities, including pest management.

1. Decrease pesticide use in target crops
2. Slow development of pesticide resistance and reduce resurgence of secondary pests
3. Decrease pesticide exposure risk to human applicators and consumers
4. Improve the marketing position of agricultural commodities in the international market place.

The Eastern European Regional Program deals with four high-value horticultural crops: tomato, cucumber, apple and grape. The countries involved in the project are Albania, Moldova and Ukraine. In the current phase, our research and technology transfer efforts involve crops that typically require some pesticide use. During our Participatory Appraisal, it was apparent that growers often used hazardous pesticides without regard for pest population monitoring, and common safety practices. The program seeks to develop an IPM program using least toxic methods, leading to adoption of practices to improve safety for farmers and their families, and producing high value crops acceptable for the European markets.

IPM is commonly acknowledged as a means to address pest population in most countries. However, there is wide disparity to the degree of implementation of IPM principles. In many areas, adequate alternatives to pesticides do not exist, are not widely known, or have not been proven effective. In many countries, growers rely on frequent indiscriminant overuse of synthetic chemical pesticides. Pesticide overuse poses an immediate risk to farm workers and their families. Ecological effects may include an induction of secondary pest outbreaks, requiring further pesticide application. There may
also be high residues of pesticides in the soil, in nearby waterways, and on marketed commodities.

A participatory appraisal of apple and grape growers in Albania revealed that most growers apply pesticides with little regard to actual pest populations as determined by monitoring. Highly toxic materials are applied, often weekly, using no personal protective equipment (PPE) (long-sleeved shirt and long pants, waterproof gloves, shoes and socks). Not only will farmer and farm family health be improved by IPM, but long term economic stability of crop production and marketing is aided by incorporation of IPM policy. Good Agricultural Practice protocols that govern the import of produce into Europe (e.g. EurepGAP, GlobalGAP) have mandatory IPM requirements. Therefore, the development of each country’s agricultural export sector is tied to adoption and spread of IPM.

Table 1 gives a summary of the uses proposed for plant protection products in the IPM CRSP Eastern European Program. All of the products are currently proposed for research. Extension recommendations and technology transfer may follow after sufficient testing. All products used in research will be used in quantities of less than 5L per season on less than 10 ha. “Research” does not imply that the products are experimental in the sense of unproven or unregistered. Products listed in the table below include commonly used pesticides for which chemical or nonchemical alternatives are being sought as well as registered products which may be improvements over the commonly used chemicals.

Table 1. Use Summary of Pesticides Proposed for the Eastern European Program

<table>
<thead>
<tr>
<th>Name</th>
<th>Research (R)</th>
<th>Extension (E)</th>
<th>Research justification – C = current practice comparison I = testing possible improved product</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>abamectin</td>
<td>R</td>
<td>I</td>
<td></td>
<td>Albania, Moldova</td>
</tr>
<tr>
<td>acetamiprid</td>
<td>R</td>
<td>I</td>
<td></td>
<td>Albania, Moldova</td>
</tr>
<tr>
<td>amitraz</td>
<td>R</td>
<td>C</td>
<td></td>
<td>Albania, Moldova</td>
</tr>
<tr>
<td>azadirachtin</td>
<td>R</td>
<td>I</td>
<td></td>
<td>Albania</td>
</tr>
<tr>
<td>azoxystrobin</td>
<td>R</td>
<td>I</td>
<td></td>
<td>Ukraine</td>
</tr>
<tr>
<td>Bacillus firmus</td>
<td>R</td>
<td>I</td>
<td></td>
<td>Albania</td>
</tr>
<tr>
<td>Beauveria bassiana</td>
<td>R</td>
<td>I</td>
<td></td>
<td>Albania</td>
</tr>
<tr>
<td>buprofezin</td>
<td>R</td>
<td>I</td>
<td></td>
<td>Albania</td>
</tr>
<tr>
<td>cymoxanil</td>
<td>R</td>
<td>C</td>
<td></td>
<td>Ukraine</td>
</tr>
<tr>
<td>dimethoate</td>
<td>R</td>
<td>C</td>
<td></td>
<td>Albania, Moldova</td>
</tr>
<tr>
<td>ethoprophos</td>
<td>R</td>
<td>C</td>
<td></td>
<td>Albania</td>
</tr>
<tr>
<td>fenamiphos</td>
<td>R</td>
<td>C</td>
<td></td>
<td>Albania</td>
</tr>
<tr>
<td>imidacloprid</td>
<td>R</td>
<td>I</td>
<td></td>
<td>Albania</td>
</tr>
<tr>
<td>mineral oil</td>
<td>R</td>
<td>I</td>
<td></td>
<td>Albania</td>
</tr>
<tr>
<td>Mycosin</td>
<td>R</td>
<td>I</td>
<td></td>
<td>Ukraine</td>
</tr>
<tr>
<td>pymetrozine</td>
<td>R</td>
<td>I</td>
<td></td>
<td>Albania</td>
</tr>
<tr>
<td>Compound</td>
<td>Country</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pyrethrin + piperonyl butoxide</td>
<td>Moldova</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reynoutria sachalinensis extract</td>
<td>Moldova</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>thiacloprid</td>
<td>Albania, Moldova</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>thiamethoxam</td>
<td>Albania, Moldova</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trichoderma lignorum</td>
<td>Moldova</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Eastern European Program Activities Requiring Pesticide Use

The reasons for the proposed uses of pesticides are primarily three-fold:

1. Human safety: Some of the currently used pesticides are highly toxic and pose a hazard to the applicator, bystanders, and the environment. The EE program is attempting to find less toxic substitutes that reflect advances in pesticide chemistry that are not yet widely benefiting farmers in Eastern Europe.

2. Quality: Quality assurance has two components that must be dealt with at the field level, preventing pesticide residues and ensuring the commodity is undamaged by pests. When chemical pesticides are used excessively or in a manner otherwise inconsistent with the pesticide label, pesticide residues can exist at harvest. Exported produce is subject to pesticide residue testing. Detected residues can result in rejection of produce shipments. If rejections occur often enough, importing countries can ban further shipments of the commodity from the violating host country. The EE program is working on residue issues by helping growers minimize pesticide use, make correct pesticide choices when pesticides must be used, and use these pesticides properly. The EE program intends to develop data on efficacy of IPM packages to keep pest damage to economically tolerable levels and maintain the quality of vegetables and fruit destined for export.

3. Pest resistance management: In Albania, Moldova, and Ukraine insect pests have become resistant to many of the old generation pesticides (organophosphates, carbamates, pyrethroids) because of repeated use on generation upon generation of insects. Insecticide resistance is especially true of some of the key insect pests in greenhouse vegetable production: whiteflies, mites and aphids. The same resistance problems have occurred because of repeated use of the same fungicide against plant diseases and repeated use of the same herbicide against weeds. Resistance development to pesticides can be slowed down and sometimes prevented by following programs that include non-chemical management and require rotation of pesticides having different modes of action. Whereas the EE program has substantial work on the non-chemical components of IPM, the present PERSUAP seeks authorization to test how compounds from different resistance classes can be incorporated into long-term resistance management programs.
Therefore, pesticides are proposed either to enhance pest management and improve crop quality in a manner consistent with improved safety of farmers and their families, or in the case of “old chemistry” pesticides, serve as comparisons of current farmer practice to the proposed improvements. Some of these old chemistry pesticides are necessary for comparison with non-chemical techniques being tested by the EE program.

**Albania** – Control trials of tomato and cucumber insects, diseases, and nematodes are to be conducted in greenhouses and plastic tunnels. Chemical treatments will include currently used products and new, safer products intended to replace the older products. Additional treatments will include non-chemical means such as soil solarization.

**Moldova** – Control of tomato and cucumber insects and diseases will include modern synthetic chemical treatments, and several botanical alternatives. Mineral oil and other non-toxic treatments for leafminers and whiteflies will be included. Work will include mathematical modeling to allow greater precision of pesticide application.

**Ukraine** – Vegetable varieties will be tested in field settings for resistance to insect and disease. Modern, safer pesticides will be evaluated in apple and grape plantings.

### D. Expected Benefits and Beneficiaries

With the acquisition of private farms after the breakup of collectives, there is a generation of new farmers in need of information. In some areas, growers use highly toxic pesticides without PPE. There is a need for improved pesticide safety knowledge and safer pesticides. Farmers have expressed a need for unbiased pest management information. However extension infrastructure has been largely neglected following economic stress after the collapse of the centralized economic systems. Agricultural research institutions have few resources with which to develop extension guidelines for new farmers. Thus, the results of IPM CRSP activities in Eastern Europe help fill a void. Benefits from these activities are: 1) better crop protection resulting in better yields and quality; and 2) reduced impacts on the agroecosystem and the larger environment. These benefits accrue mostly to farmers.

### E. Pesticide Characteristic Profiles.

Table 2 presents the pesticides for which the IPM CRSP requests authorization to carry out its research and extension activities. Detailed information on each insecticide, miticide, nematicide, and fungicide, are presented in the following pesticide characteristic profiles according to the requirements of USAID Environmental Compliance Procedures for pesticides (Title 22 CFR 216.3(b) 1). All products are proposed for experimental use. They are either new candidates offering environmental, safety, efficacy, or economic advantages over currently used products, or they are currently used products required for comparisons of the new candidates.
Table 2. Pesticides Recommended for the IPM CRSP Eastern European Research and Extension Activities.

<table>
<thead>
<tr>
<th>Active Ingredient (Illustrative Trade Names)</th>
<th>Toxicity Class of Typical Formulation</th>
<th>REI* (hours)</th>
<th>PHI* (days)</th>
<th>Resistance Class</th>
<th>Notes **</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INSECTICIDES/MITICIDES/NEMATICIDES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>abamectin (Vermitec, Agri-Mek)</td>
<td>II</td>
<td>12</td>
<td>7</td>
<td>6</td>
<td>RUP</td>
</tr>
<tr>
<td>acetamiprid (Assail, Intruder)</td>
<td>III</td>
<td>12</td>
<td>7</td>
<td>4A</td>
<td></td>
</tr>
<tr>
<td>amitraz</td>
<td>III</td>
<td>24</td>
<td>21</td>
<td>19A</td>
<td></td>
</tr>
<tr>
<td>azadirachtin [neem] (Aza-Direct, Neemix, Trilogy, Azatin)</td>
<td>IV</td>
<td>4</td>
<td>0</td>
<td>18B</td>
<td></td>
</tr>
<tr>
<td><em>Bacillus firmus</em></td>
<td>-</td>
<td>preplant</td>
<td></td>
<td></td>
<td>Non-toxic mode of action</td>
</tr>
<tr>
<td><em>Beauveria bassiana</em> (Naturalis)</td>
<td>IV</td>
<td>0</td>
<td>0</td>
<td>NA</td>
<td>Non-toxic mode of action</td>
</tr>
<tr>
<td>buprofezin (Applaud, Centaur, Courier)</td>
<td>III</td>
<td>12</td>
<td>n/a</td>
<td>18A</td>
<td>Not labeled on tomatoes in the US</td>
</tr>
<tr>
<td>dimethoate</td>
<td>II</td>
<td>48</td>
<td>variable</td>
<td>1B</td>
<td></td>
</tr>
<tr>
<td>ethoprophos</td>
<td>I</td>
<td>48</td>
<td>preplant</td>
<td>1B</td>
<td>RUP</td>
</tr>
<tr>
<td>fenamiphos</td>
<td>I</td>
<td>48</td>
<td>9 months</td>
<td>1B</td>
<td>RUP</td>
</tr>
<tr>
<td>imidacloprid (Confidor, Admire, Provado)</td>
<td>III</td>
<td>12</td>
<td>Admire 14</td>
<td>4A</td>
<td></td>
</tr>
<tr>
<td>mineral oil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pymetrozine (Fulfill)</td>
<td>III</td>
<td>12</td>
<td>0</td>
<td>9B</td>
<td></td>
</tr>
<tr>
<td>pyrethrin + piperonyl butoxide</td>
<td>III</td>
<td>12</td>
<td>0</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><em>reynoutria sachalinensis</em> extract</td>
<td>II</td>
<td>24</td>
<td>0</td>
<td>non-toxic induced resistance</td>
<td></td>
</tr>
<tr>
<td>thiacloprid</td>
<td>II</td>
<td>12</td>
<td>30</td>
<td>4A</td>
<td></td>
</tr>
<tr>
<td>thiamethoxam (Actara, Platinum)</td>
<td>III</td>
<td>12</td>
<td>Platinum 30; Actara 0</td>
<td>4A</td>
<td></td>
</tr>
<tr>
<td><strong>FUNGICIDES/BACTERICIDES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>azoxystrobin (Amistar, Quadris)</td>
<td>IV</td>
<td>4</td>
<td>0</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>cymoxanil (Curzate)</td>
<td>II</td>
<td>12</td>
<td>3</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td><em>trichoderma lignorum</em></td>
<td>IV</td>
<td>0</td>
<td>0</td>
<td>NA</td>
<td>Non-toxic mode of action</td>
</tr>
<tr>
<td>Mycosin</td>
<td></td>
<td>-</td>
<td>-</td>
<td>NA</td>
<td>Non-toxic mode of action</td>
</tr>
</tbody>
</table>

* Typical values for common formulations. REI and PHI must be followed according to the label of the particular product being used.

** RUP = U.S. EPA Restricted Use Pesticide
abamectin (Vertimec 1.8EC, Agri-Mek)

### A. Registration status
U.S. EPA has several abamectin products registered; one product being Agri-Mek. Registration status (Registration No.100-898) of Agri-Mek (abamectin 2%): Toxicity Class II insecticide with the signal word Warning. Abamectin is registered in Albania as Vertimec 1.8 EC (Registration No.181/15.10.2005). It is registered in Moldova. It is not being proposed for research in Ukraine.

### B. Basis for selection
Abamectin is an IRAC Group 6 chloride channel activator insecticide. It has a unique mode of action and is highly effective against a range of plant damaging mites, certain leaf feeding beetles and worms, leafminers, psyllids and thrips. Abamectin provides a novel mode of action for controlling mites that have developed resistance to other miticides. It has a narrower range of non-target beneficial insects that are sensitive to it compared to other commonly used broad-spectrum miticides. It also has a wide range of compatibility with other agricultural products and provides maximum leaf uptake resulting in long residual effectiveness. Abamectin is a Restricted Use Pesticide due to toxicity to fish, mammals, and aquatic organisms. Commercial use of abamectin in the US has demonstrated a history of reasonable margin-of-safety with careful application by trained personnel. With appropriate safety precautions, abamectin will provide a new mechanism of action in controlling mites that have developed resistance to traditional, more frequently used miticides in Albania.

### C. Extent to which the proposed pesticide is part of an Integrated Pest Management program
Abamectin’s chemistry and unique mode of action help control mite and insect biotypes resistant to other commonly used pesticides. This benefit also makes abamectin an ideal foundation for rotational programs. Because abamectin has selective toxicity, it is not as damaging to natural enemy populations as other broad spectrum insecticides such as organophosphates or pyrethroids.

### D. Proposed method or methods of application, including availability of appropriate application and safety equipment.
Agri-Mek is applied as a foliar spray using high volume spray equipment and a minimum of 187L/ha. It has a 7-day pre-harvest interval. It should not be applied more than twice consecutively. Applications should be no less than seven days apart. For resistance management, abamectin should not be used on tomatoes or other fruiting vegetables destined for transplantation. Abamectin may not be applied within 25 feet of a body of water. Abamectin must not be applied to or allowed to drift onto blooming crops or weeds if bees are present. Standard PPE should be worn, including chemical resistant gloves, when mixing, loading, applying, or cleaning up.

### E. Acute and long-term toxicological hazards and risk avoidance
Abamectin has moderate mammalian acute toxicity. The oral LD\(_{50}\)rat \(\approx 300\text{mg/kg}\) for Agri-Mek and approximately 11mg/kg for the abamectin active ingredient. The dermal LD\(_{50}\)rat>2000mg/kg for Agri-Mek and about 1800mg/kg for the abamectin active ingredient. Agri-Mek may be fatal if swallowed. It may cause diarrhea, respiratory depression, tremors, and chronic pulmonary edema or congestion and hemorrhage. Product is harmful if inhaled or absorbed by the skin. Abamectin formulations can cause substantial but temporary eye injury.
Central nervous system effects have been found in lab animals having chronic exposure. PPE must be worn when mixing, loading, and applying this product. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided. The product must be applied such that it cannot be carried into bodies of water as irrigation runoff. Tank mixes and clean-up rinsate must not enter bodies of water or be disposed of near wells.

**F. Effectiveness for the proposed use**
Abamectin is highly effective against a range of plant-damaging mites (probably the most widely-used miticide in the U.S.). It also controls certain leaf feeding beetles and worms, leafminers, psyllids and thrips. Efficacy data specific to our conditions are to be generated in the proposed research.

**G. Compatibility of the proposed pesticide with target and nontarget ecosystems**
Abamectin is relatively non-toxic to birds (oral LD₅₀ = 2000 to 3000mg/kg). However, it is highly toxic to fish (LC₅₀ = 3.6 to10ppb) and extremely toxic to aquatic invertebrates, showing chronic toxicity to *Daphnia magna* at extremely low concentrations (LC₅₀ = 0.09ppb). It is also highly toxic to bees (LC₅₀ = 0.4µg/bee). Bee exposure must be avoided (i.e. avoid spraying during blooming and during peak bee foraging times of day). Avoid application near surface water in order to minimize exposure to fish and aquatic organisms. Abamectin is practically insoluble in water, but will mix after 24h. It binds strongly to soil particles. Therefore, abamectin has low potential to contaminate drinking water. Aquatic organisms have a low probability of exposure in the proposed use in covered tunnels. Abamectin is rapidly broken down in the presence of sunlight (half-life of 1 day on sunny surfaces, up to two weeks on shaded soil (Cornell Pesticide Management Education Program http://pmep.cce.cornell.edu/profiles/extoxnet/24d-captan/abamectin-ext.html). Residues do not, therefore, remain long on the surface.

**H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils**
Abamectin will be used experimentally in Albania and Moldova to treat mites on cucurbitaceous and solanaceous vegetables grown. In Albania plastic sheet-covered tunnels are constructed on alluvial soils where the water table is more than 2m down. These covered tunnels present an enclosed cropping system that is isolated from the local environment. Therefore, pesticide drift will be essentially nil. If it is demonstrated to be effective and economical compared to more toxic insecticides, it will be recommended for situations when chemical control is determined to be necessary.

**I. Availability and effectiveness of other pesticides or nonchemical control methods**
Abamectin is effective on the target insects, and its mode of action is unique, making it useful in resistance management. While traditional acaricides, such as dimethoate and amitraz (Mitac), are available, mites are increasingly becoming resistant to these overused pesticides. Some others are discontinued, e.g. dicofol (Kelthane). The registrations of some of these miticides are being cancelled.

**J. Requesting country's ability to regulate or control the distribution, storage, use, and disposal**
See Section IIB.

**K. Provisions made for training of users**
Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these
transfer sessions, applicators are instructed on proper solution preparation and application
techniques, and informed of precautionary steps in dealing with this pesticide, including
handling, storage, and first aid. PPE will be provided as necessary by the project for its on-
station and on-farm research. See Section IIA, Safe Use Action Plan.

<table>
<thead>
<tr>
<th><strong>L. Provisions made for monitoring the use and effectiveness</strong></th>
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<tbody>
<tr>
<td>The monitoring of phytophagous mites will be carried out in the course of determining efficacy. Establishing the effectiveness of abamectin is a research objective.</td>
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<tr>
<th><strong>M. Mitigation of possible adverse effects</strong></th>
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<tr>
<td>The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. Direct exposure of aquatic organism should be avoided by not applying directly to surface water or in situations allowing runoff.</td>
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<tr>
<th><strong>N. Restricted Use Status</strong></th>
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<tr>
<td>Agri-Mek is a U.S. EPA Restricted Use Pesticide due its toxicity to fish, mammals, and aquatic organisms. Other formulations of abamectin may have similar or different toxicity profiles.</td>
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</tbody>
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acetamiprid (Ramplan, Assail, Intruder)

A. Registration status
There are five U.S registered formulations of acetamiprid including two formulations of Assail (Cerexagri-Nisso), Intruder water-soluble powder (DuPont), and Tristar (Cleary Chemical). Assail 70WP (Registration No. 8033-23-82695) is a 70% acetamiprid wettable powder with Toxicity Class III and the signal word Caution. Other formulations and brands are similarly classified. In the U.S., Assail is registered for use in food crops including tomato. Acetamiprid is registered in Albania under the trade name Ramplan (Registration No. 213, 10/28/2004), which is 20% acetamiprid. Ramplan is registered for use in food crops including vegetables - tomato, cucumber, etc. It is not being proposed for use in Ukraine.

B. Basis for selection
Acetamiprid is a neonicotinoid (IRAC Class 4A) insecticide. Neonicotinoids mimic the acetylcholine receptor at the neural gap, causing continual stimulation. The mode of action is different from cholinesterase inhibitors, which cause the build-up of naturally produced acetylcholine, but both modes of action cause death of the insect due to paralysis of the nervous system. Because of low mammalian, avian, and fish toxicity, it is considered by the U.S. EPA as a low-risk alternative to more toxic organophosphate insecticides. Acetamiprid is one specific compound that must be tested against pests in Albania and Moldova. It will be evaluated in comparison with other materials in this pesticide class. If proven effective it is among the preferred neonicotinyl pesticides being tested for developing a grower recommendation.

C. Extent to which the proposed pesticide is part of an Integrated Pest Management program
Acetamiprid is an appropriate component in an IPM program because it is a good substitute for more toxic cholinesterase inhibitor pesticides (i.e. organophosphates and carbamates). Acetamiprid is a better alternative than products currently used in Albania and Moldova to control whiteflies and aphids. Acetamiprid will replace Lannate (methomyl) and Salut (chlorpyriphos-ethyl plus dimethoate).

D. Proposed method or methods of application, including availability of appropriate application and safety equipment.
Acetamiprid is usually sold as a wettable powder or water soluble powder in formulations containing 70% active ingredient. Ramplan in Moldova is a 20% formulation. Acetamiprid is applied as a foliar spray at a rate of 93 to 140L/ha at intervals no more frequently than 7 days apart. It should be used no more than four times per season and should be rotated with other chemicals within the season when multiple sprays are required. It should not be used in any irrigation system. It has a 12-hour restricted entry interval. Standard PPE must be worn when mixing, loading, applying, or cleaning up. PPE for this product is long-sleeved shirts and pants, chemical resistant gloves, shoes and socks. PPE will be provided as necessary by the project for its on-station and on-farm research.

E. Acute and long-term toxicological hazards and risk avoidance
Assail has a Toxicity Class III due to low oral toxicity (LD50 rat = 1064mg/kg), low dermal toxicity (LD50 rabbit > 2000mg/kg), and slight inhalation toxicity (4-hour LC50 rat = 2.88mg/L). Acetamiprid may be moderately toxic if swallowed, slightly toxic if absorbed through the skin, slightly irritating to skin, and moderately irritating to eyes. It, therefore, poses little risk to applicators.
PPE should be worn when mixing, loading, and applying any product. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided.

### F. Effectiveness for the proposed use
Acetamiprid is effective against thrips, weevils, aphids, and whiteflies. Efficacy data specific to local conditions in Albania and Moldova are to be generated in the proposed research.

### G. Compatibility of the proposed pesticide with target and nontarget ecosystems
Acetamiprid is toxic to bees. Application should be made to avoid application to plants in flower and when bees are foraging. Acetamiprid has low toxicity to fish and other aquatic organisms. Among a variety of aquatic organisms against which Assail was tested, the lowest LC\(_{50}\) was 3000mg/L, making Assail practically nontoxic to aquatic organisms. Low rates of application and rapid degradation in the environment make acetamiprid unlikely to move into groundwater or pose a significant risk in runoff.

### H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils
Acetamiprid will be used experimentally to treat cucurbitaceous and solanaceous plants grown in plastic sheet-covered tunnels. These tunnels are constructed on alluvial soils where the water table is more than 2m down. These covered tunnels present an enclosed cropping system that is isolated from the local environment. Therefore, pesticide drift will be essentially nil. In Moldova they will be used in a temperate climate. If it is demonstrated to be effective and economical compared to more toxic insecticides, it will be recommended for situations when chemical control is determined to be necessary.

### I. Availability and effectiveness of other pesticides or nonchemical control methods
While several aphicides and insecticides are locally available and commonly used, they are unlikely to be more effective or less hazardous to users and the environment than those pesticides in the neonicotinoid class (Class 4A). This pesticide class was selected for testing several members as an alternative to the increasingly pest-resistant organophosphates and broad-spectrum pyrethroid pesticides. Non-chemical control methods (cultural, mechanical, and biological) are considered when developing an IPM program.

Other neonicotinoid insecticides have similar properties to acetamiprid. However, acetamiprid is one of the least hazardous neonicotinyls, which are themselves a less hazardous group of chemicals than other commonly used insecticides in Eastern Europe. Cultural techniques can discourage the build-up of economically damaging populations of whiteflies and aphids. Particularly important is conservation of natural enemies that keep aphids and whiteflies in check. Concurrent cropping patterns are important because adjacent fields can be a source for whiteflies to enter a crop or a sink for whitefly egress when a crop is harvested. When chemicals must be used, a resistance management plan should be followed that limits the number of applications of a particular product and provides guidance on rotation of pesticides in different resistance classes.

### J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal
See section IIB.

### K. Provisions made for training of users
Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application
techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan.

L. Provisions made for monitoring the use and effectiveness
The monitoring of key pests will involve one or more of the following: scouting, investigation of infestation level, and mortality and population levels through standard methods such as colored sticky traps. The effectiveness of acetamiprid will be the subject of IPM CRSP research before recommendations will be made.

M. Mitigation of possible adverse effects
The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. Avoiding application near surface water or in conditions allowing runoff will minimize exposure of fish and other aquatic organisms.

N. Restricted Use Status
Acetamiprid is not a U.S. EPA Restricted Use Pesticide.
Amitraz is a miticide/insecticide that affects octopamine receptors in the nervous system causing increased nervous activity. Amitraz is an emulsifiable concentrate, wettable powder, or a pour-on powder used to control ticks, mites, pear suckers, scale insects, mealybugs, whiteflies, aphids, and eggs and first instar larvae of Lepidoptera that damage fruits and vegetables.

C. Extent to which the proposed pesticide is part of an Integrated Pest Management program
Amitraz is not part of an IPM program. In this project it will be a control with which we will test less toxic pest management techniques with the intention of discontinuing use of amitraz.

D. Proposed method or methods of application, including availability of appropriate application and safety equipment. (addressed in Safe Use Action Plan)

E. Acute and long-term toxicological hazards and risk avoidance
Amitraz has a low acute oral toxicity (LD$_{50}$ rats $\approx$ 650 and mice $>$1600mg/kg). The inhalation is essentially non-toxic (LC$_{50}$ (6h) rats $\approx$ 65mg/L air).
PPE should be worn when mixing, loading, and applying any product. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided.

F. Effectiveness for the proposed use
Amitraz is an effective pesticide. However, target pests often develop a resistance to its mode of action. Therefore, a variety of effective alternatives are needed. In this research amitraz is a control to which alternatives are to be compared for replacement or cooperation.

G. Compatibility of the proposed pesticide with target and nontarget ecosystems
Amitraz is slightly toxic to birds. The dietary LC$_{50}$ (8 day) $\approx$ 7,000 mg/kg for mallard ducks and 1,800 mg/kg for Japanese quail. The oral LD$_{50}$ for bobwhite quail is $\approx$ 788 mg/kg. Amitraz is moderately toxic to fish. The LC$_{50}$ (96-hour exposure) $\approx$ 1.3 mg/L for bluegill sunfish and 3.2-4.2 mg/L for harlequin fish. Amitraz is relatively non-toxic to bees. The LD$_{50}$ is $\approx$ 12 micrograms per bee by ingestion and $\approx$ 3.6 mg/L by direct spraying.

H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils
Amitraz will be used in Albania and Moldova for control of mites in field production of tomato and cucumber.

I. Availability and effectiveness of other pesticides or nonchemical control methods
Cultural techniques can discourage the build-up of economically damaging populations of whiteflies and aphids. Particularly important is conservation of natural enemies that keep aphids and whiteflies in check. Concurrent cropping patterns are important because adjacent fields can be a source for whiteflies to enter a crop or a sink for whitefly egress when a crop is harvested. When chemicals must be used, a resistance management plan should be followed.
that limits the number of applications of a particular product and provides guidance on rotation of pesticides in different resistance classes.

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<td><strong>J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal</strong></td>
<td>See Section IIB.</td>
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<tr>
<td><strong>K. Provisions made for training of users</strong></td>
<td>See Section IIA, Safe Use Action Plan.</td>
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<tr>
<td><strong>L. Provisions made for monitoring the use and effectiveness</strong></td>
<td>See Section IIA, Safe Use Action Plan.</td>
</tr>
<tr>
<td><strong>M. Mitigation of possible adverse effects</strong></td>
<td>Amitraz breaks down rapidly in both water and in soil containing oxygen. Its’ half-life is less than one day. The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. Avoiding application near surface water or in conditions allowing runoff will minimize exposure of fish and other aquatic organisms.</td>
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<tr>
<td><strong>N. Restricted Use Status</strong></td>
<td>Amitraz is not classified as a Restricted Use Pesticide by the EPA.</td>
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azadirachtin (Aza-Direct, Nemazal T/S, Neemix, Trilogy, Azatin)

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<tr>
<th>A. Registration status</th>
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<tr>
<td>Azadirachtin is a general use insecticide registered in the United States (registration No. 71908-1-10163) by Gowan Company. There are many other manufacturers around the world of this botanical extract. It is a Toxicity Class IV insecticide with the signal word Caution. Azadirachtin, available in Albania under the trade name Nemazal T/S, is not yet registered in Albania. Based on Regulation of Pesticide Use in Albania (Article 10) for experimental trials, Plant Protection Institute is allowed to use unregistered pesticides. The commercial product Azadirachtin is not available in Albania; it will be ordered in Italy. The product has the trade name Neemazal T/S (azadirachtin 1%=10gr/L). It is not being proposed for use in Moldova or Ukraine.</td>
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<th>B. Basis for selection</th>
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<td>Azadirachtin is registered as a botanical biopesticide in the United States in food crops such as cucumbers, tomatoes, and apples. Many formulations are authorized for organic farming. It is a biological insecticide (Insect Growth Regulator) working as a growth/molting disruptor (ecdysone agonist) and antifeedant (IRAC Class 18B). It is a complex mixture of related tetraterpene limonoids extracted from seeds or leaves of the neem tree, <em>Azadirachta indica</em>. Azadirachtin A is a majority constituent of extracts. It is active against a wide range of insect pests.</td>
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<th>C. Extent to which the proposed pesticide is part of an Integrated Pest Management program</th>
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<tr>
<td>Azadirachtin is very compatible with IPM programs since it has a low toxicity profile. It must be ingested to be effective; therefore, only insects that consume sprayed plant tissue are susceptible, leaving predatory arthropods and pollinators largely unaffected. In addition, because it is a growth regulator, adult insects are typically not harmed by the product.</td>
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<th>D. Proposed method or methods of application, including availability of appropriate application and safety equipment.</th>
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<tr>
<td>Azadirachtin can be applied as a foliar spray or through a low pressure, drip or sprinkler chemigation system. In places where the neem tree grows, neem extract is produced artisanally by growers or at a small-scale commercial level from neem kernels or leaves. Such extracts can vary widely in their azadirachtin content because of variations in trees, harvest, post-harvest, processing, and extraction efficiency. Leaf extractions have a lower content of azadirachtin than kernel extractions, but reduce the possibility of phytotoxic burning. Standard safety equipment such as long-sleeved shirt and pants, waterproof gloves and shoes plus socks should be worn when mixing, loading, applying, and cleaning up.</td>
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<th>E. Acute and long-term toxicological hazards and risk avoidance</th>
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<td>Azadirachtin has an oral LD$<em>{50}$ in rats &gt;5000mg/kg and dermal LD$</em>{50}$ in rats &gt;2000mg/kg. It is known neither as a teratogen nor carcinogen. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided.</td>
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<th>F. Effectiveness for the proposed use</th>
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<tr>
<td>Azadirachtin is used to control leaf-feeding beetles, whiteflies, aphids, and thrips. Efficacy data specific to Albanian conditions will be generated by the proposed research.</td>
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<th>G. Compatibility of the proposed pesticide with target and nontarget ecosystems</th>
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<tr>
<td>Azadirachtin and neem extract is very compatible with target and nontarget ecosystems</td>
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because it has a very low toxicity profile. It has low toxicity to fish and other aquatic organisms and must be ingested to act. Therefore, only insects that consume sprayed plant tissue are susceptible, leaving predatory arthropods and pollinators largely unaffected. Its potential for mobility in soil is very low. Accumulation in the environment is not expected.

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<th><strong>H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils</strong></th>
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<tr>
<td>Azadirachtin will be used in Albania to treat pests on cucurbitaceous and solanaceous vegetables grown in plastic sheet-covered tunnels. These tunnels are constructed on alluvial soils where the water table is more than 2m down. These covered tunnels present an enclosed cropping system that is isolated from the local environment. Therefore, pesticide drift will be essentially nil. If it is demonstrated to be effective and economical compared to more toxic insecticides, then upon registration in Albania, azadirachtin will be recommended as an alternative to synthetic chemical pesticides.</td>
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<thead>
<tr>
<th><strong>I. Availability and effectiveness of other pesticides or nonchemical control methods</strong></th>
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<tbody>
<tr>
<td>Azadirachtin is a soft alternative to more toxic insecticides. However the effectiveness of azadirachtin is often lower than traditional synthetic chemical insecticides. Azadirachtin is a desirable choice when effectiveness for a particular target pest under local conditions has been tested, but it should not relied upon for controlling heavy infestations prior to such experience. Cultural techniques can discourage the build-up of economically damaging populations of target organisms. Crop rotation, use of resistant varieties, and good field sanitation can discourage pest build-up. When chemicals must be used, a resistance management plan should be followed that limits the number of applications of a particular product and provides guidance on rotation of pesticides in different resistance classes.</td>
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<tr>
<th><strong>J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal</strong></th>
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<td>See Section IIB.</td>
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<tr>
<th><strong>K. Provisions made for training of users</strong></th>
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<tr>
<td>Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan.</td>
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<th><strong>L. Provisions made for monitoring the use and effectiveness</strong></th>
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<tr>
<td>Effectiveness under local conditions will be assessed as a primary objective of the research being conducted.</td>
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<tr>
<th><strong>M. Mitigation of possible adverse effects</strong></th>
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<tr>
<td>No adverse effects are anticipated with the use of this product. The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. Avoiding application near surface water or in conditions allowing runoff will minimize exposure of fish and other aquatic organisms.</td>
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<tr>
<th><strong>N. Restricted Use Status</strong></th>
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<tr>
<td>Azadirachtin is not a Restricted Use Pesticide.</td>
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### azoxystrobin (Quadris, Amistar)

#### A. Registration status
Azoxystrobin registered in the U.S. All formulations are produced by Syngenta and sold under the trade names Abound, Amistar, Quadris (e.g. Quadris EPA Reg. No. 100-1098). It is a broad spectrum fungicide labeled on numerous crops in the United States. Azoxystrobin was registered for turf under the U.S EPA Reduced Risk track. It is also formulated with a second or third active ingredient such as mefenoxam, chlorothalonil, propiconizole, or fludioxonil and sold under different trade names by Syngenta (Dynasty CST, Quadris Opti, Quilt, and Uniform. Azoxystrobin is an authorized active ingredient in the European Union through 31 December 2011 (European Commission Directive 2007/21/EC). It is a General Use fungicide with a Toxicity Class IV with a signal word Caution. Azoxystrobin is currently registered in Ukraine. It is not being proposed for use in Albania or Moldova.

#### B. Basis for selection
Azoxystrobin is a broad spectrum insecticide of low vertebrate toxicity most often used preventatively, but also with curative properties. Azoxystrobin is a preventative fungicide that has systemic and curative properties for many plant diseases. Azoxystrobin is in the Group 11 FRAC resistance class. Its effectiveness against a variety of diseases makes it a versatile component of an IPM disease management program. It is in a class of fungicides called betamethoxyacrylates (U.S. EPA Pesticide Fact Sheet: Azoxystrobin). Azoxystrobin are in the class of Quinone Outside Inhibitors (QoI) fungicides. QoI fungicides inhibit a fungus’s cellular metabolic electron transport system at the cytochromes. It also disrupts cell membrane synthesis. Azoxystrobin is an appropriate fungicide to rotate with fungicides from other resistance classes. It has a 0-day pre-harvest interval for tomatoes.

#### C. Extent to which the proposed pesticide is part of an Integrated Pest Management program
Azoxystrobin is appropriate in an IPM program. It has broad activity against many fungal diseases, but also has low mammalian toxicity and low impact on nontarget invertebrates. Cultural practices such as selection of disease-resistant varieties and good field sanitation to reduce over-season inoculum should be used to reduce the need to spray fungicides. Proper plant nutrition, plant spacing, and proper crop rotation can also reduce the incidence and severity of disease.

#### D. Proposed method or methods of application, including availability of appropriate application and safety equipment.
Azoxystrobin is a suspension, typically about 23% active ingredient, used as an aqueous foliar spray and/or soil spray. Technical grade azoxystrobin is a powdery solid. Typical spray equipment can be used, except for ultra-low volume (ULV) spray equipment. It may be applied to the soil in-furrow at planting or before plant emergence to manage soil-borne diseases or it can be early applied post-emergence to control damping off and other diseases that infect at the plant-soil interface. It should not be applied until 21 days after transplanting or 35 days after planting. It is extremely phytotoxic to certain apple varieties, so spray drift must be avoided around apples. In using an IPM approach, season-long spray plans should be made in which fungicides are rotated throughout the season according to resistance class. Such planning should be part of technical training. As part of a resistance management plan, Group 11 fungicides should be no more than 1/3 of the fungicide sprays made per season. Standard PPE minimizes risk to applicators, including waterproof gloves.
### E. Acute and long-term toxicological hazards and risk avoidance

Quadris and other azoxystrobin formulations have an oral LD₅₀ >5000 mg/kg and a dermal LD₅₀ >4000 mg/kg for rats. It is therefore essentially nontoxic at normal exposure levels expected during mixing and application. Quadris is mildly irritating to the eyes. It is not carcinogenic. Weak chromosomal damage in mammalian cells was observed at cytotoxic levels exceeding normal exposure levels, but such effects were not observed in whole animal studies. The product is neither carcinogenic, nor teratogenic. Exposure risk to applicators is low, but standard PPE should be worn. Field workers must respect re-entry periods according to the label and wear protective clothing if necessary.

### F. Effectiveness for the proposed use

Azoxystrobin is effective against a variety of fungal diseases and have systemic properties that make it useful for arresting development of fungal pathogens inside plant tissues. Diseases that are controlled on tomato include: early blight (*Alternaria solani*), late blight (*Phytophthora infestans*), anthracnose (*Colletotrichum* spp.), septoria leaf spot (*Septoria lycopersici*), powdery mildew (*Oidiopsis sicula*), and black mold (*Alternaria alternata*).

### G. Compatibility of the proposed pesticide with target and nontarget ecosystems

Azoxystrobin is highly toxic to fish (LC₅₀ trout = 0.7pp and LC₅₀ bluegill = 1.1ppm) and aquatic invertebrates in freshwater (LC₅₀ Daphnia = 0.26ppm) and in marine or estuarine environments. Azoxystrobin is essentially non-toxic to birds (LC₅₀ bird >5000ppm) and bees (LC₅₀ bee >200µg/bee). It should not be applied directly to water or in situations where runoff is possible. Azoxystrobin is stable in water but not persistent in soil in the presence of light. It can remain in the environment for several months or more. In places where the water table is shallow, azoxystrobin can leach into the subterranean water. This product is extremely phytotoxic to some apple varieties. Extreme caution will be exerted to avoid drift to apples.

### H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils

This product will be used in Ukraine on small farm research plots containing cucumbers, and on larger plots containing grapes. The climate area is forest-steppe, temperate climate with high humidity in the areas where cucumbers will be grown and lower humidity where the grapes are grown. The soils will be grey podzolic and black earth (chestnut chernozems).

### I. Availability and effectiveness of other pesticides or nonchemical control methods

Azoxystrobin is known to be an effective anti-fungal pesticide. It is part of a rational array of chemical products that can be considered in conjunction with cultural management of fungal diseases such as selection of disease-tolerant varieties, and field sanitation. Azoxystrobin should be rotated with fungicides of another resistance class in order to retard development of resistance by the pathogens. Cultural practices such as selection of disease-resistant varieties and good field sanitation to reduce over-season inoculum should be used to reduce the need to spray fungicides. Proper plant nutrition, plant spacing, and proper crop rotation also can reduce the incidence and severity of disease. In this study, azoxystrobin will be compared with the biological agent Micosan.

### J. Requesting country's ability to regulate or control the distribution, storage, use, and disposal

See Section IIB.

### K. Provisions made for training of users

Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these
transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan.

<table>
<thead>
<tr>
<th>L. Provisions made for monitoring the use and effectiveness</th>
</tr>
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<tbody>
<tr>
<td>Testing effectiveness of azoxystrobin is the objective of the proposed research.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M. Mitigation of possible adverse effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. Avoiding application near surface water or in conditions allowing runoff will minimize exposure of fish and other aquatic organisms.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>N. Restricted Use Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>The U.S. EPA does not classify azoxystrobin as a Restricted Use Pesticide.</td>
</tr>
</tbody>
</table>
**Bacillus firmus (BioNem)**

**A. Registration status**

*Bacillus firmus* is not registered in the United States. Eight other *Bacillus* species are registered as biopesticides by the U.S. EPA. Its toxicity profile gives it the equivalent of Toxicity Class IV with no required signal word because it is essentially non-toxic. BioNem is produced from *B. firmus* strain I-1582 by Agro-Green in Israel and registered in Israel for nematode control for cucumbers, tomatoes, peppers, eggplants, and herbs. *B. firmus* strain 1-1582 was submitted to the U.S. EPA for registration as a microbial biopesticide in February 2007 by Agro-Green (Federal Register 72(44):10210-10211). A submission to U.S. EPA for exemption to residue tolerances was submitted in March 2007 (Federal Register 72(544): 13277-13279). *B. firmus* is registered in Albania with the trade name BioNem WP Reg. No 253 date10/30/06.

**B. Basis for selection**

*B. firmus* is a cosmopolitan soil bacterium that provides long-term control against phytopathogenic nematodes, including root knot nematodes (*Meloidogyne* sp.). BioNem is a commercially produced product made from *B. firmus*. It is nontoxic to humans and plants.

**C. Extent to which the proposed pesticide is part of an Integrated Pest Management program**

Because *B. firmus* is nontoxic for nontarget invertebrates and vertebrates. It is an appropriate biopesticide for an integrated pest management (IPM) program.

**D. Proposed method or methods of application, including availability of appropriate application and safety equipment.**

*B. firmus* is applied as an aqueous spray or a drench to soil as a pre-plant nematicide. Normal PPE is recommended. Compatibility with bactericide application must be considered.

**E. Acute and long-term toxicological hazards and risk avoidance**

As a microbial biopesticide with non-toxic mode of action, *B. firmus* is presents essentially no risk to fish and wildlife. In comparison to the toxic organophosphate nematicides used in Albania (ethoprophos and fenamiphos) *B. firmus* would substantially reduce risk to applicators.

**F. Effectiveness for the proposed use**

*B. firmus* is labeled for use in multiple food crops against nematodes. Efficacy data specific to our conditions are to be generated in the proposed research. The manufacturer of Bio-nem claims nematode suppression for ten months in field trials.

**G. Compatibility of the proposed pesticide with target and nontarget ecosystems**

*B. firmus* is effective against pest nematodes and is essentially non-toxic to fish and wildlife.

**H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils**

*B. firmus* will be used in Albania against soil nematodes in vegetable fields. Rows of cucumbers and tomatoes are grown under plastic-covered tunnels that serve as temporary greenhouses. These tunnels are constructed on alluvial soils where the water table is more than 2m down. These covered tunnels present an enclosed cropping system that is isolated from the local environment. If it is demonstrated to be effective and economical compared to more toxic nematicides, the project will provide efficacy data to support registration of *B. firmus* in Albania.
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Availability and effectiveness of other pesticides or nonchemical control methods</td>
<td>The effectiveness of <em>B. firmus</em> will be compared to the organophosphorus nematicides ethoprophos and fenamiphos as a possible substitute.</td>
</tr>
<tr>
<td>J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal</td>
<td>See Section IIB.</td>
</tr>
<tr>
<td>K. Provisions made for training of users</td>
<td>Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan.</td>
</tr>
<tr>
<td>L. Provisions made for monitoring the use and effectiveness</td>
<td>This product is being proposed for use as the object of research for finding low-toxicity alternatives to synthetic chemicals.</td>
</tr>
<tr>
<td>M. Mitigation of possible adverse effects</td>
<td>No adverse affects are anticipated with this biopesticide.</td>
</tr>
<tr>
<td>N. Restricted Use Status</td>
<td><em>B. firmus</em> is not yet registered in the United States. When registered, it will not be a Restricted Use Pesticide.</td>
</tr>
</tbody>
</table>
**Beauveria bassiana**

**A. Registration status**
Four isolates of the entomopathogenic fungus have been registered by the U.S. EPA. The two current registrations are Troy Boverin (Registration No. 053871-00008) and Fermone Naturalis (Registration No. 053871-00009). Prior registrations ended for commercial reasons are Mycotrol and Botanigard. *Beauveria bassiana* is not registered in Albania. It is registered in many other European countries. Based on Regulation of Pesticide Use in Albania (Article 10) for experimental trials, The Plant Protection Institute may allow the use of unregistered pesticides. The commercial product Fermone Naturalis (*Beauveria 7.2%*) is purchased in Italy. It is not produced in Albania, so an interested importer is required before a registration can be sought. Its use is not being proposed for use in Moldova and Ukraine.

**B. Basis for selection**
*Beauveria bassiana* is a facultative insect pathogen found in soils throughout the world. It is the most widely used and most extensive researched bio-control fungus in the world. Its mode of action is to infect insects by contact, growing and reproducing within the insect until lethargy and death occur. Individual strains of *Beauveria bassiana* tend to have a narrow host specificity, although strains like GHA are pathogenic to a wide variety of insects. *B. bassiana* is the most widely used fungus-based bioinsecticide in the world. Based on the label of *Beauveria* this product can be used for controlling whiteflies, aphids and mites.

**C. Extent to which the proposed pesticide is part of an Integrated Pest Management program**
*B. bassiana* is a biopesticide that is essentially toxic to vertebrates and to invertebrates outside a particular isolate’s host range. It has a nontoxic pathogenic mode of action adapted to insect hosts, making it benign to all nontarget organisms. It conserves natural enemies and is, therefore, an ideal component in an IPM program.

**D. Proposed method or methods of application, including availability of appropriate application and safety equipment.**
*B. bassiana* is applied as a high volume aqueous suspension or ultra low volume (ULV) petroleum-based suspension. *B. bassiana* is only effective by contact – either by direct deposition on the insect or by secondary pick-up of spores from treated surfaces.

**E. Acute and long-term toxicological hazards and risk avoidance**
*B. bassiana* has little potential to provoke adverse acute effects. Its nontoxic mode of action is specific to insects. *B. bassiana* is a biopesticide comprising of conidial spores of the fungus. In nature they germinate only on insect cuticle and can infect only insects. These characteristics make it essentially non-toxic to vertebrates.
PPE should be worn when mixing, loading, and applying this product, although the risk of harmful effects due to unanticipated exposure is very low. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided.

**F. Effectiveness for the proposed use**
This product will be targeted against whiteflies, aphids and mites. The GHA strain is registered in the U.S. for use against whiteflies, aphids, beetles (weevils and borers, as well as numerous Lepidoptera species including diamondback moth (*Plutella xylostella*). Strain HF23 is effective against flies. Strain 447 is registered in the U.S. in a bait station against ants. *B. bassiana* isolate ATCC74040 is effective against *Beauveria* must make contact with its
target, so it has little to no effect on species whose damaging life stage is inside the plant. The *B. bassiana* strain that will be used experimentally in Albania is labeled in the US and Italy for use in multiple situations such as vegetables, nursery/greenhouses, ornamentals, etc. against whiteflies and mites. Efficacy data specific to our conditions are to be generated in the proposed research.

**G. Compatibility of the proposed pesticide with target and nontarget ecosystems**
*B. bassiana* has little potential to adversely affect nontarget ecosystems. Some isolates may be slightly pathogenic to bees. Although the host range of *B. bassiana* is large, the host specificity of any one particular isolate is rather narrow. It is, therefore, benign towards nontarget vertebrates and most nontarget invertebrates.

**H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils**
*B. bassiana* will be used in Albania to treat pests on cucurbitaceous and solanaceous vegetables grown in plastic sheet-covered tunnels. These tunnels are constructed on alluvial soils where the water table is more than 2m down. These covered tunnels present an enclosed cropping system that is isolated from the local environment. Therefore, pesticide drift will be essentially nil. If it is demonstrated to be effective and economical compared to more toxic insecticides, then upon registration in Albania, it will be recommended for situations when chemical control is determined to be necessary.

**I. Availability and effectiveness of other pesticides or nonchemical control methods**
*B. bassiana* is an insect-pathogenic fungus that functions as an insecticide. In situations where *B. bassiana* would be effective and economical, it should be preferred over chemical insecticides. While traditional acaricides and insecticides are available, these pesticides are showing increasing pest resistance and are hazardous compared to *B. bassiana*. Non-chemical control methods are considered when developing an IPM program. The integration of chemical and biological control is desirable.

**J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal.** See Section IIB.

**K. Provisions made for training of users**
Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan.

**L. Provisions made for monitoring the use and effectiveness**
Monitoring effectiveness of *B. bassiana* in greenhouse environments where it is used in other European countries is the research objective justifying its use.

**M. Mitigation of possible adverse effects**
No adverse effects are anticipated with *B. bassiana*. The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product.

**N. Restricted Use Status**
The U.S. EPA does not classify this *B. bassiana* as a Restricted Use Pesticide.
buprofezin (Applaud, Centaur, Courier)

A. Registration status
There are four formulations of buprofezin registered in the United States. All are products by Nichino in Japan, where the active ingredient is manufactured (e.g., Applaud 70 DF, U.S. EPA Registration No. 71711-21; Centaur, Registration No. 71711-15). Buprofezin is a general use insecticide. All formulations of buprofezin in the United States are Toxicity Class III with signal word Caution. Buprofezin is registered in the U.S. on fruits, but not currently on vegetables. The U.S. banana registration includes whiteflies. Buprofezin is currently registered in Albania under the trade name Ronin 25WP (Registration No. 268 dt.30/10/2006). Buprofezin is registered in the EU Annex 1 of 91/414/EEC. The Codes Alimentarius has established maximum residue limits on cucumber and tomato as 1mg/kg. Use in Moldova and Ukraine is not being proposed.

B. Basis for selection
Buprofezin is an insect growth regulator with a nontoxic mode of action against immature insects. It is a chitin synthesis inhibitor which disables molting of immature insects and suppresses oviposition in adults (IRAC Resistance Class 16). It is particularly effective against Homoptera, Coleoptera and Acarina. Buprofezin has very low mammalian toxicity and is essentially nontoxic to nontarget invertebrates. Buprofezin will work well as a pesticide rotation in whitefly pesticide resistance management.

C. Extent to which the proposed pesticide is part of an Integrated Pest Management program
Buprofezin is appropriate for an IPM program because of its novel mode of action, relatively narrow host-specificity, and low toxicity. It is considered nontoxic to birds and aquatic organisms. Its low potential for disturbing beneficial components of the local agroecosystem makes it compatible with an IPM approach. Buprofezin will be evaluated in comparison to other products with different modes of action.

D. Proposed method or methods of application, including availability of appropriate application and safety equipment.
Buprofezin can be applied as a foliar spray. It should not be applied through an irrigation system. Buprofezin has a 12-hour restricted entry interval. Standard PPE should be worn during mixing, loading, application, and clean-up.

E. Acute and long-term toxicological hazards and risk avoidance
Applaud has low mammalian toxicity (oral LD<sub>50</sub>rat>5000mg/kg; dermal LD<sub>50</sub>rat>2000mg/kg) making it only slightly toxic. No acute or long-term hazards are anticipated when buprofezin is used according to the label. PPE should be worn when mixing, loading, and applying this product. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided.

F. Effectiveness for the proposed use
Buprofezin is labeled for use on multiple food crops against whiteflies. Efficacy data specific to conditions in Albania are to be generated in the proposed research.

G. Compatibility of the proposed pesticide with target and nontarget ecosystems
Buprofezin has narrow specificity, being active against immature holometabolous insects. It is considered nontoxic to birds and nontoxic to aquatic organisms at its limit of solubility in
water. It does not harm predatory mites and beneficial insects such as parasitic wasps.

### H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils

Buprofezin will be used in Albania to treat whiteflies on cucurbitaceous and solanaceous vegetables grown in plastic sheet-covered tunnels. These tunnels are constructed on alluvial soils where the water table is more than 2m down. These covered tunnels present an enclosed cropping system that is isolated from the local environment. Therefore, pesticide drift will be essentially nil. If it is demonstrated to be effective and economical compared to more toxic insecticides, then upon registration in Albania, it will be recommended for situations when chemical control is determined to be necessary.

### I. Availability and effectiveness of other pesticides or nonchemical control methods

Other insecticides are effective at controlling whiteflies, but most have more severe nontarget impact than buprofezin. Cultural techniques can discourage the build-up of economically damaging populations of target organisms. Crop rotation, use of resistant varieties, and good field sanitation can discourage pest build-up. When chemicals must be used, a resistance management plan should be followed that limits the number of applications of a particular product and provides guidance on rotation of pesticides in different resistance classes.

### J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal

See Section IIB

### K. Provisions made for training of users

Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan.

### L. Provisions made for monitoring the use and effectiveness

The efficacy of whitefly control using mineral oil is a research task of the IPM CRSP.

### M. Mitigation of possible adverse effects

No adverse environmental effects are anticipated. The primary mitigating action with respect to worker safety is ensuring applicators are properly trained in safe use and have knowledge about proper use of pesticides.

### N. Restricted Use Status

The U.S. EPA does not classify buprofezin as a Restricted Use Pesticide.
**A. Registration status**
Curzate 60DF is a fungicide registered by the U.S. EPA (Registration No.352-592) (60% cymoxanil): It is in Toxicity Class II and carries the signal word Warning. Cymoxanil is registered in Ukraine under the trade name Kurzat (cymoxanil 4.2% and copper chlorine oxide 39.8%). It is not proposed for use in Albania or Moldova.

**B. Basis for selection**
Cymoxanil is currently used in Ukraine as a foliar fungicide. It is required for research as a comparison for other products.

**C. Extent to which the proposed pesticide is part of an Integrated Pest Management program**
Cymoxanil is recommended for integration into an overall disease and pest management strategy whenever a fungicide is required. Integrated Pest Management (IPM) programs should utilize different fungicides that target other modes of action, so as to reduce resistance development among pests. Other forms of IPM include field scouting and treating when disease forecasting models reach locally determined action levels. Cymoxanil is a member of Fungicide Resistance Class 11: Complex III. It is a commonly used fungicide in Ukraine. Research is planned to compare it with the plant defense inducer Mycosin.

**D. Proposed method or methods of application, including availability of appropriate application and safety equipment.**
The pesticide is applied as a diluted spray serving as a locally systemic fungicide on plant surfaces. Standard PPE must be worn when mixing, loading, applying, or cleaning up. PPE for this product is long-sleeved shirts and pants, chemical resistant gloves, shoes and socks.

**E. Acute and long-term toxicological hazards and risk avoidance**
The oral LD$_{50}$ for rats is between 400-500 mg/kg, placing it in the moderate to high acute toxicity range. However, there is practically no risk to dermal toxicity (rat LD$_{50}$ > 5000 mg/kg), and it is essentially non-toxic by inhalation (4-hour LC$_{50}$rat > 5mg/L). Potential side effects include temporary reversible irritation with itching, redness, swelling, or rash, temporary reversible eye irritation with tearing, pain, or blurred vision. Ingestion may cause temporary nervous system depression with dizziness, confusion, lack of coordination, drowsiness, or unconsciousness, changes in hematology measurements, pathological changes in the liver, and weight loss. Inhalation may cause irritation of the respiratory tract with sneezing or runny nose. Proper handling and supervision will avoid any ill-effects. The use of PPE will also help alleviate any risk to the applicator. This product is practically non-toxic to birds, and moderately toxic to fish and invertebrates. PPE should be worn when mixing, loading, and applying this product. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided. The product must be applied such that it cannot be carried into bodies of water as irrigation runoff. Tank mixes and clean-up rinsate must not enter bodies of water or be disposed of near wells.

**F. Effectiveness for the proposed use**
Cymoxanil is labeled for use on multiple food crops against some blights and mildews. Efficacy data specific to our conditions are to be generated in the proposed research.

**G. Compatibility of the proposed pesticide with target and nontarget ecosystems**
Cymoxanil is has low toxicity to birds (LD$_{50}$ > 2250mg/kg). It is moderately toxic to fish.
(LC$_{50}$ = 29 to 61mg/L) and aquatic invertebrates (LC$_{50}$ *Daphnia magna* = 27mg/L). Therefore, care must be taken not to apply cymoxanil in a manner that risks runoff of spray drift into bodies of water.

**H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils**
Cymoxanil will be tested in open farm fields in Lviv Oblast, a forest-steppe, temperate climate with high humidity and soils that are podzolic and chestnut chernozems.

**I. Availability and effectiveness of other pesticides or nonchemical control methods**
Nonchemical control products for foliar plant fungal diseases are not commercially used in Ukraine. Cymoxanil will be tested against the biological fungicide Mycosan. Other fungicides such as azoxystrobin are frequently used. Cultural practices such as selection of disease-resistant varieties and good field sanitation to reduce over-season inoculum should be used to reduce the need to spray fungicides. Proper plant nutrition, plant spacing, and proper crop rotation also can reduce the incidence and severity of disease.

**J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal**
See Section IIB.

**K. Provisions made for training of users**
Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan.

**L. Provisions made for monitoring the use and effectiveness**
The efficacy of cymoxanil compared to Mycosan is the objective of the proposed research.

**M. Mitigation of possible adverse effects**
The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. Avoiding application near surface water or in conditions allowing runoff will minimize exposure of fish and other aquatic organisms.

**N. Restricted Use Status**
The U.S. EPA does not classify cymoxanil as a Restricted Use Pesticide.
**dimethoate**

**A. Registration status**
Dimethoate is registered in the U.S. (EPA PC Code 035001). There are many formulations of Dimethoate registered in the U.S., for example Dimethoate 2.67 (EPA registration no. 19713-232) and Dimethoate 25WP (EPA registration no. 10163-55-10951). Dimethoate is registered in the EU (EC registration no. 015-051-00-4). It is highly toxic and is classified by the EPA as Toxicity Class I and II with signal words Danger and Warning.

**B. Basis for selection**
Dimethoate is an organophosphate cholinesterase inhibitor that works as a systemic insecticide and acaricide with contact and stomach action. It is used to control a wide range of mites, insects and other invertebrates.

**C. Extent to which the proposed pesticide is part of an Integrated Pest Management program**
Dimethoate is not part of an IPM program. In this project it will be a control with which we will test less toxic pest management techniques with the intention of discontinuing use of dimethoate.

**D. Proposed method or methods of application, including availability of appropriate application and safety equipment.**
see section IIA Safe Use Action Plan

**E. Acute and long-term toxicological hazards and risk avoidance**
Dimethoate is moderately toxic to mammals (acute oral LD$_{50}$ rats 387, mice 160 and rabbits 300 mg/kg, and an acute dermal LD$_{50}$rats >2000mg/kg). It is non-irritating to the skin and eyes (rabbits). It has a relatively low toxicity via inhalation (LC$_{50}$ (4h) rats >1.6mg/L air).

**F. Effectiveness for the proposed use**
Dimethoate is an effective pesticide. However, target pests often develop a resistance to its mode of action. Therefore, a variety of effective alternatives are needed. In this research dimethoate is a control to which alternatives are to be compared for replacement or combined use.

**G. Compatibility of the proposed pesticide with target and nontarget ecosystems**
Dimethoate is toxic to wildlife and the environment. It is moderately toxic to birds (acute oral LD$_{50}$ for mallard ducks 42mg/kg).

**H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils**
Dimethoate will be used in Albania to treat pests on cucurbitaceous and solanaceous vegetables grown in plastic sheet-covered tunnels. These tunnels are constructed on alluvial soils where the water table is more than 2m down. These covered tunnels present an enclosed cropping system that is isolated from the local environment. Therefore, pesticide drift will be essentially nil.

**I. Availability and effectiveness of other pesticides or nonchemical control methods**
There are other, less toxic, pesticides available. Dimethoate will be used as a control in this project for comparison to these less toxic pesticides. If research proves the less toxic methods to be effective with respect to specific plants and location, they will be suggested as replacements for dimethoate.
| J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal |
| see section IIB. |
| K. Provisions made for training of users |
| Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. |
| See Section IIA, Safe Use Action Plan. |
| L. Provisions made for monitoring the use and effectiveness |
| See Section IIA, Safe Use Action Plan. |
| M. Mitigation of possible adverse effects |
| Dimethoate will not be used through irrigation systems. The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. Direct exposure of aquatic organism should be avoided by not applying directly to surface water or in situations allowing runoff. |
| N. Restricted Use Status |
| The U.S. EPA does not classify dimethoate as a Restricted Use Pesticide. |
### ethoprophos, ethoprop

<table>
<thead>
<tr>
<th>A. Registration status</th>
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</thead>
<tbody>
<tr>
<td>Ethoprophos (ethoprop) is registered in the United States as Mocap (Registration No. 264-457 and 264-458) manufactured by Bayer Crop Sciences. Several formulations are available. It is a Toxicity Class I nematicide with the signal world Poison. It is registered in the European Union.</td>
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</tbody>
</table>

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<thead>
<tr>
<th>B. Basis for selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethoprop is an organophosphate, therefore a cholinesterase inhibitor. It is a commonly used nematicide in Albania. Ethoprophos is restricted to use as a nematicide to be used by certified applicators in Annex I of the European Commission’s list of approved active ingredients as of 31 March 2007 (EC Directive 2007/52/EC). Therefore, a replacement for it must be found for Albanian agriculture, where there is no pesticide applicator certification program. Because is it commonly used in Albania, it is proposed for use in research as a standard against which to compare safer alternatives for controlling nematodes, such as soil solarization using plastic sheets.</td>
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<tr>
<th>C. Extent to which the proposed pesticide is part of an Integrated Pest Management program</th>
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</thead>
<tbody>
<tr>
<td>Ethoprop is inappropriate for an IPM program because of its high dermal toxicity and its lack of unique mechanism. It is being proposed only as a comparison for less hazardous approaches to nematode control.</td>
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</tbody>
</table>

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<thead>
<tr>
<th>D. Proposed method or methods of application, including availability of appropriate application and safety equipment.</th>
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</thead>
<tbody>
<tr>
<td>Ethoprop is applied as a liquid to soil. Mixers and applicators must use great caution to avoid skin contact with the product. PPE such as coveralls over shirt and pants, chemical resistant gloves, boots and socks are required. The project will supply needed materials and close supervision of the experimental applications.</td>
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<tr>
<th>E. Acute and long-term toxicological hazards and risk avoidance</th>
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<tbody>
<tr>
<td>Ethoprop is very toxic (LD$<em>{50}$oral= 16 to 47 mg/kg) for emulsifiable concentrate formulations. Dermal LD$</em>{50}$= 166 to 369mg/kg in rats for the emulsifiable concentrate, making it very toxic via dermal exposure. It has an oral LD$<em>{50}$=250mg/kg in rats for 15% granular formulations concentrates with dermal LD$</em>{50}$&gt;2000mg/kg in rabbits for 15% granular formulations. The 20% granular formulation has an equally high dermal rat LD$<em>{50}$&gt;2000mg/kg, but a very low dermal LD$</em>{50}$ of 46mk/kg for rabbits. The use of PPE that covers skin will help reduce any risk to the applicator. The product must not be applied over water or under conditions where it may wash into water.</td>
</tr>
<tr>
<td>PPE must be worn when mixing, loading, and applying this product. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided. The product must be applied such that it cannot be carried into bodies of water as irrigation runoff. Tank mixes and clean-up rinsate must not enter bodies of water or be disposed of near wells.</td>
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<tr>
<th>F. Effectiveness for the proposed use</th>
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<tbody>
<tr>
<td>Ethoprop is an effective product against nematodes and soil-dwelling insects. It is a contact poison that functions by inhibiting cholinesterase resorption as do all members of the organophosphate family.</td>
</tr>
</tbody>
</table>
G. Compatibility of the proposed pesticide with target and nontarget ecosystems
Ethoprop is toxic to fish (bluegill 96h, LC$_{50}$ $\approx$ 150µg/L) and aquatic invertebrates. It is very toxic to birds (acute oral LC$_{50}$ malards $\approx$ 12.6 mg/kg/14 days). Birds may be killed if they visit freshly treated areas. This product is not well suited for application by farmers who typically lack specialized pesticide safety knowledge and have no specialized knowledge about the characteristics of the product.

H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils
Ethoprop will be used in Albania as an experimental control representing standard nematode control compared to less hazardous alternatives. It will be applied to cucurbitaceous and solanaceous vegetables grown in plastic sheet-covered tunnels. The tunnels are constructed on alluvial soils where the water table is more than 2m down. These covered tunnels present an enclosed cropping system that is isolated from the local environment. Therefore, pesticide drift will be essentially nil.

I. Availability and effectiveness of other pesticides or nonchemical control methods
The East European program is seeking safer alternatives to ethanoprop through its research program. It will be compared with plastic sheet soil solarization. Black plastic sheets are placed over the vegetable beds before planting to heat the soil sufficiently to kill nematodes. The biopesticide Bacillus firmus will also be tested as an alternative to chemical nematicides. Ethoprop will not be a recommendation to farmers.

J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal
See Section IIB.

K. Provisions made for training of users
Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan.

L. Provisions made for monitoring the use and effectiveness
Ethoprop is proposed as an experimental control with the objective of finding low-toxicity alternatives to it. The objective for using this chemical is to measure the relative effectiveness of other products that are safer.

M. Mitigation of possible adverse effects
The most important adverse effect to avoid is dermal exposure of applicators. Especially high levels of precaution will be taken when this product is used. PPE will include chemical-resistant gloves, coveralls over shirts and pants, and boots. Because of high dermal toxicity, gloves, long-sleeved coveralls will be provided by the project. Application will be conducted under close supervision. A wash bucket with soap and clean water will be available in case of emergency exposure. By ensuring that all applicators and handlers are properly trained and by adhering to advisory information, unanticipated exposure can be avoided and managed.

N. Restricted Use Status
Ethoprop is a Restricted Use Pesticide because of high dermal toxicity and the consequent danger it poses to humans and animals.
<table>
<thead>
<tr>
<th><strong>fenamiphos (Nemacur, Nemaphos 40)</strong></th>
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<tbody>
<tr>
<td><strong>A. Registration status</strong></td>
</tr>
<tr>
<td>Fenamiphos is registered by U.S. EPA as Nemacur 3ES (Registration No. 264-731). Fenamiphos has Toxicity Class I and a signal word Danger. Fenamiphos is registered in Albania. Reg. No 247 date 04/26/06. The trade name is Nemaphos 400EC.</td>
</tr>
<tr>
<td><strong>B. Basis for selection</strong></td>
</tr>
<tr>
<td>Fenamiphos is used as a nematicide in Albania. It is a systemic (i.e. incorporated into plant tissue) and used pre- or post-emergence. Because it is commonly used in Albania, it must be used in research as a standard against which to compare safer alternatives for controlling nematodes, such as soil solarization using plastic sheets.</td>
</tr>
<tr>
<td><strong>C. Extent to which the proposed pesticide is part of an Integrated Pest Management program</strong></td>
</tr>
<tr>
<td>Fenamiphos is inappropriate for an IPM program because of its high dermal toxicity and its lack of unique mode of action. It is being proposed only as a comparison for less hazardous approaches to nematode control. This highly toxic product is commonly used by farmers in the Eastern European program. The IPM CRSP is not promoting its use. Rather it is a commonly used product against which we must compare newer, less toxic alternatives.</td>
</tr>
<tr>
<td><strong>D. Proposed method or methods of application, including availability of appropriate application and safety equipment.</strong></td>
</tr>
<tr>
<td>Fenamiphos is applied as a liquid to soil. Mixers and applicators must use great caution to avoid skin contact with the product. PPE such as coveralls over shirt and pants, chemical resistant gloves, boots and socks are required. The project will supply needed materials and close supervision of the experimental applications.</td>
</tr>
<tr>
<td><strong>E. Acute and long-term toxicological hazards and risk avoidance</strong></td>
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<tr>
<td>The active ingredient is highly toxic orally and dermally ($LD_{50}$ rat $\approx 8\text{mg/kg}$; and dermal $LD_{50}$ rat $= 80\text{mg/kg}$). Oral toxicity of formulations is greater than the active ingredient ($LD_{50}$ rat $&lt; 2 \text{mg/kg}$). It is therefore, acutely toxic to mammals. This chemical is extremely toxic if inhaled or absorbed ($LC_{50}$ rat $\approx 0.11$ to $0.17 \text{mg/L}$). Being an organophosphate, it is metabolized quickly, so chronic toxicity requires continuous exposure. Symptoms of chronic toxicity include the inhibition of plasma, red blood cell, and/or brain cholinesterase activity. Fenamiphos is extremely toxic if it enters the body by any means (dermal, oral, inhalation, and ingestion). Should the chemical enter the eye, corrosive irreversible eye damage may occur. The use of PPE and strict adherence to the label will reduce risks to the applicator. Standard PPE as well as eye protection must be worn when mixing, loading, and applying this product. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided. The product must be applied such that it cannot be carried into bodies of water as irrigation runoff. Tank mixes and clean-up rinsate must not enter bodies of water or be disposed of near wells.</td>
</tr>
<tr>
<td><strong>F. Effectiveness for the proposed use</strong></td>
</tr>
<tr>
<td>Fenamiphos is an organophosphate, thus a member of Insecticide Resistance class 1B. It is therefore not a unique candidate in an insect resistance management plan. Fenamiphos is labeled for use on multiple food crops against nematodes. Efficacy data specific to our conditions are to be generated in the proposed research with the intention of demonstrating safer, effective alternatives such as soil solarization and the biopesticide <em>Bacillus firmus</em>.</td>
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<tr>
<td>Section</td>
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<tr>
<td>G. Compatibility of the proposed pesticide with target and nontarget ecosystems</td>
</tr>
<tr>
<td>H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils</td>
</tr>
<tr>
<td>I. Availability and effectiveness of other pesticides or nonchemical control methods</td>
</tr>
<tr>
<td>J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal</td>
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<tr>
<td>K. Provisions made for training of users</td>
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<tr>
<td>L. Provisions made for monitoring the use and effectiveness</td>
</tr>
<tr>
<td>M. Mitigation of possible adverse effects</td>
</tr>
<tr>
<td>N. Restricted Use Status</td>
</tr>
</tbody>
</table>
**A. Registration status**

Imidacloprid is a general use insecticide. There are several U.S. registered formulations including soil-applied formulations like Admire 2F (imidacloprid 21.4%) and Admire Pro (imidacloprid 42.8%), which can be injected into drip-irrigation and a foliar spray formulation (Provado 1.6F). Provado has U.S. EPA registration 264-763 (imidacloprid 17.4%). Imidacloprid formulations have toxicity class III and carry the signal word Caution. In the United States, imidacloprid is registered for many fruit and vegetable crops including tomatoes. Imidacloprid is currently registered in Moldova and was be labeled for tomatoes in December 2007. Confidor SI200 (imidacloprid) is registered in Albania (Reg. No 233 date 02/01/06.). This chemical is not being proposed for use in Ukraine.

**B. Basis for selection**

Imidacloprid is a chloronicotinyl insecticide (IRAC Class 4A) with a relatively broad spectrum of contact and ingestion activity against insects. Imidacloprid is considered a low-risk chemical for incorporation into IPM programs when chemical control is necessary. When applied to soil, it is systemic in plants making it very effective against sucking insects such as aphids, thrips, whiteflies, and leafhoppers. It also controls leaf-feeding beetles. It has significant residual activity and controls pests such as whiteflies and Colorado potato beetles that have become resistant to other classes of insecticides. Imidacloprid interferes with the transmission of nerve impulses in insects. Whereas organophosphate insecticides interfere with the breakdown of acetylcholine, imidacloprid stimulates nerve cells by acting on a different (nicotinic) receptor protein. However, in contrast to acetylcholine, which is quickly degraded by the enzyme acetylcholine-esterase, imidacloprid is inactivated either very slowly or not at all. Pest feeding activity ceases within minutes to hours. Death occurs usually within 24-48 hours, but can take longer.

**C. Extent to which the proposed pesticide is part of an Integrated Pest Management program**

Imidacloprid is an appropriate component in an IPM program because it is a good substitute for more toxic cholinesterase inhibitor pesticides (i.e. organophosphates and carbamates). Imidacloprid is generally less toxic to beneficial arthropods than organophosphates, carbamates, or pyrethroids. Pesticides in these groups are harmful to beneficial arthropods, often causing outbreaks of secondary pest because of the loss of beneficial predator insects. The neonicotinoids proposed here, including imidacloprid will be a better fit in an IPM program because they better safeguard the integrity of natural enemy populations. Soil application can replace foliar applications, further reducing the exposure of beneficial arthropods. With respect to user hazard and environmental hazard, imidacloprid is a better alternative than products currently used in Albania and Moldova to control whiteflies and aphids. Its efficacy compared to these chemicals and to other neonicotinoids needs to be tested. Imidacloprid will replace Lannate (methomyl) and Salut (chlorpyrifos-ethyl plus dimethoate).

**D. Proposed method or methods of application, including availability of appropriate application and safety equipment.**

Imidacloprid is applied as foliar spray or soil application. Soil application is done through chemigation in drip systems or in-furrow spraying on or below the seed. Band application over the seed incorporated to a depth of 4.5cm can be done if followed by irrigation. Spraying
in seedbeds or nurseries will not confer long-term protection when transplanted. Transplants will need a field spray within two weeks to confer long-term protection. Care should be taken to preserve the planting media around seedlings when transplanted. There is a 21-day PHI for all formulations of Admire. There is a 12-month plantback for any crops for which the product is not registered or for which there is no established residue tolerance.

PPE must be worn when handling this product. PPE will be provided as necessary by the project for its on-station and on-farm research.

E. Acute and long-term toxicological hazards and risk avoidance
Imidacloprid has relatively low oral, dermal and inhalation toxicity to mammals. Most formulations carry the signal word Caution. Imidacloprid is toxic to mammals orally (oral LD$_{50}$rat = 450 to 609 mg/kg) but has very low toxicity dermally (LD$_{50}$rat > 4000 mg / kg). Formulations tend to have lower oral toxicity (e.g. Admire oral LD$_{50}$rat >4000mg/L). It is not known to be a carcinogen, teratogen or mutagen.

PPE should be worn when mixing, loading, and applying this product. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided. The product must be applied such that it cannot be carried into bodies of water as irrigation runoff.

F. Effectiveness for the proposed use
Imidacloprid is labeled for use on multiple food crops primarily against sucking insects such as aphids and whiteflies, and rasping fluid-feeding insects such as thrips. Efficacy data specific to our conditions are to be generated in the proposed research.

G. Compatibility of the proposed pesticide with target and nontarget ecosystems
Imidacloprid is highly toxic to bees. Formulated product is toxic to aquatic invertebrates, although the active ingredient has low toxicity to freshwater invertebrates. Imidacloprid has properties consistent with chemicals that can leach into groundwater. Caution should be used in considering application where groundwater is close to the surface and soil permeability is high.

H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils
Imidacloprid will be used experimentally to treat cucurbitaceous and solanaceous plants grown in plastic sheet-covered tunnels. These tunnels are constructed on alluvial soils where the water table is more than 2m down. These covered tunnels present an enclosed cropping system that is isolated from the local environment. Therefore, pesticide drift will be essentially nil. In Moldova they will be used in a temperate climate. If it is demonstrated to be effective and economical compared to more toxic insecticides, it will be recommended for situations when chemical control is determined to be necessary.

I. Availability and effectiveness of other pesticides or nonchemical control methods
While several aphicides and insecticides are locally available and commonly used, they are unlikely to be more effective or less hazardous to users and the environment than those pesticides in the neonicotinoid class (Class 4A) This pesticide class was selected for testing several members as an alternative to the increasingly pest-resistant organophosphates and broad-spectrum pyrethroid pesticides. Non-chemical control methods (cultural, mechanical, and biological) are considered when developing an IPM program.

Cultural techniques can discourage the build-up of economically damaging populations of target organisms. Crop rotation, use of resistant varieties, and good field sanitation can
discourage pest build-up. When chemicals must be used, a resistance management plan should be followed that limits the number of applications of a particular product and provides guidance on rotation of pesticides in different resistance classes. Imidacloprid should be rotated with insecticides in a different resistance classes.

### J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal
See section IIB.

### K. Provisions made for training of users
Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan. Research in Moldova is conducted at the Institute for Plant Protection and Ecological Agriculture, which has the means to safely regulate the proposed pesticide use. Research in Albania is conducted on several farms where trained applicators are selected for safe use of proposed pesticides.

### L. Provisions made for monitoring the use and effectiveness
The monitoring of key pests will involve one or more of the following: scouting, investigation of infestation level, and mortality and population levels through standard methods such as colored sticky traps. The effectiveness of imidacloprid will be the subject of IPM CRSP research before recommendations will be made.

### M. Mitigation of possible adverse effects
The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. Avoiding application near surface water or in conditions allowing runoff will minimize exposure of fish and other aquatic organisms.

### N. Restricted Use Status
The U.S. EPA does not classify imidacloprid as a Restricted Use Pesticide.
mineral oil (UFO, Ultra Fine Oil 98.8%)

<table>
<thead>
<tr>
<th>A. Registration status</th>
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<tbody>
<tr>
<td>There are several mineral oil products that are registered in the United States, such as JMS Stylet-oil. U.S. EPA registration status (Registration No., 65564-1) of Organic JMS Stylet-oil Based on Regulation of Pesticide Use in Albania (Article 10) for experimental trials, Plant Protection Institute is allowed to use unregistered pesticides. The mineral oil UFO (Ultra fine Oil) is not yet registered in Albania, though two similar products are registered: Biolide E (mineral oil) from Sipcama Italy Reg No 126 03/21/00 and Polithiol from Cerexagri Reg No.293 date 02/23/20007. It is not being proposed for use in Moldova or Ukraine. (CAS No. 8042-47-5)</td>
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<thead>
<tr>
<th>B. Basis for selection</th>
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<tbody>
<tr>
<td>Mineral oil is used to control the egg stages of mites and other insects. The oil coats the egg and prevents the normal exchange of gases. The respiratory system can also be blocked causing suffocation. Mineral oil is non-toxic to natural enemies and is an organic alternative to some of the more toxic synthetic pesticides.</td>
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<tr>
<th>C. Extent to which the proposed pesticide is part of an Integrated Pest Management program</th>
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<tbody>
<tr>
<td>Mineral oil is a non-toxic alternative to pest management than commonly used synthetic chemicals to control the key pests: mites, aphids and whiteflies in greenhouses. It is widely used around the world for non-toxicant control of insects. The data from experiments being conducted with mineral oil may be used to attract interest in getting it registered in Albania.</td>
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<tr>
<th>D. Proposed method or methods of application, including availability of appropriate application and safety equipment.</th>
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<tbody>
<tr>
<td>Mineral oil is applied as a spray. The product poses essentially no risk to applicators. However, standard PPE should be worn when handling it (long-sleeved shirts and pants, shoes, and socks).</td>
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<tr>
<th>E. Acute and long-term toxicological hazards and risk avoidance</th>
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</thead>
<tbody>
<tr>
<td>The oral LD$_{50}$ for rats is &gt;5000mg/kg, placing it in the practically non-toxic range. Exposure effects include minor skin and eye irritation. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided.</td>
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<tr>
<th>F. Effectiveness for the proposed use</th>
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<tbody>
<tr>
<td>Mineral oil is labeled for use on multiple food crops against key greenhouse pests (aphids, whiteflies, mites, etc.). Efficacy data specific to our conditions are to be generated in the proposed research.</td>
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<tr>
<th>G. Compatibility of the proposed pesticide with target and nontarget ecosystems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral oil is effective against some greenhouse pests, and practically non-toxic to fish (rainbow trout LC$_{50}$ &gt; 25,000 ppm) and wildlife. It is essentially non-hazardous to beneficial insects.</td>
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</table>

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<tr>
<th>H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils</th>
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<tbody>
<tr>
<td>See Section 2.</td>
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<table>
<thead>
<tr>
<th>I. Availability and effectiveness of other pesticides or nonchemical control methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral oil is a non-toxicant and is being tested as an alternative and a rotation choice in whitefly management.</td>
</tr>
<tr>
<td>J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal</td>
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<tr>
<td>See Section IIB.</td>
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<tr>
<th>K. Provisions made for training of users</th>
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</thead>
<tbody>
<tr>
<td>The lack of toxicity of mineral oil means that special training is not necessary for its safe use. Nevertheless, PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan.</td>
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</tbody>
</table>

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<tr>
<th>L. Provisions made for monitoring the use and effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral oil is being proposed as an object of research for finding low-toxicity alternatives to synthetic chemicals.</td>
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</tbody>
</table>

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<thead>
<tr>
<th>M. Mitigation of possible adverse effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. Avoiding application near surface water or in conditions allowing runoff will minimize exposure of fish and other aquatic organisms.</td>
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<tr>
<th>N. Restricted Use Status</th>
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<tbody>
<tr>
<td>The U.S. EPA does not classify this chemical as a Restricted Use Pesticide.</td>
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</tbody>
</table>
Mycosin/Mycosan

A. Registration status
Mycosin is not registered in the U.S. It is a sulfur-based biological compound that is used to promote disease resistance in plants such as grape vines. It can be made using different formulations of organic compounds such as sulfuric acidic, clay minerals and deactivated yeast cell membranes, or aluminum sulfate and horsetail extract. It is considered a biofungicide but is also known to facilitate plant resistance to fungi. Mycosin has been used in organic fruit production in both Europe and New Zealand. Biogrow is one of the companies that sell Mycosin as a biofungicide. It can also be used as a food additive for livestock and is used to give racing pigeons extra strength and stamina. The formulations of Mycosin that are used as an animal food additive are produced in the Czech Republic (registration no.288767) and are available in the UK. It is available on the Ukrainian market.

B. Basis for selection
Mycosin is a less toxic alternative to copper-based fungicides. If research proves it to be effective with respect to specific plants and location, it will be suggested to replace fungicides such as cymoxanil (Curzate).

C. Extent to which the proposed pesticide is part of an Integrated Pest Management program.
Mycosin is a plant resistance inducer and a biofungicide. It boosts a plants ability to resist fungal pathogens such as downy mildew, which is common to viticulture. In an IPM program, mycosin has the potential to reduce the use of inorganic copper fungicides not only because it is less harmful itself, but also because it indirectly increases the effectiveness of less toxic chemical pesticides and fungicides. (Vegetable Crops Research Bulletin volume 64/2006, Research Institute of Vegetable Crops Instytut Warzywnictwa, Skiermiewice, Poland PL ISSN 1506-9427.)

D. Proposed method or methods of application, including availability of appropriate application and safety equipment.
Mycosin is applied as a spray approximately 500g/ha. Standard PPE should be worn when mixing, loading, applying, or cleaning up. PPE for this product is long-sleeved shirts and pants, chemical resistant gloves, shoes and socks.

E. Acute and long-term toxicological hazards and risk avoidance
Mycosin can be found in nature and has not previously shown toxicity to mammals. There is relatively no risk to humans as long as it is used according to the label. Slight skin irritations were the only reactions in toxicity tests. It is usually used in small amounts so even soil pH should not change when Mycosin is applied.

F. Effectiveness for the proposed use
Previous research has shown mycosin to be an effective fungicide alternative through resistance induction. This study will compare its effectiveness with that of the more toxic copper fungicides.

G. Compatibility of the proposed pesticide with target and nontarget ecosystems
Mycosin may cause phytotoxicity to plants to which it is applied if the concentrations are too high.
**H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils**
Mycosan will be tested in open farm fields in Lviv Oblast, a forest-steppe, temperate climate with high humidity and soils that are podzolic and chestnut chernozems.

**I. Availability and effectiveness of other pesticides or nonchemical control methods**
Nonchemical control products for foliar plant fungal diseases are not commercially used in Ukraine. Mycosin will be tested against the synthetic chemical fungicide cymoxanil. Other fungicides such as azoxystrobin are frequently used. Cultural practices such as selection of disease-resistant varieties and good field sanitation to reduce over-season inoculum should be used to reduce the need to spray fungicides. Proper plant nutrition, plant spacing, and proper crop rotation also can reduce the incidence and severity of disease.

**J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal**
See Section IIB.

**K. Provisions made for training of users**
Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan.

**L. Provisions made for monitoring the use and effectiveness**
The efficacy of mycosin compared to cymoxanil is the objective of the proposed research.

**M. Mitigation of possible adverse effects**
The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. Avoiding application near surface water or in conditions allowing runoff will minimize exposure of fish and other aquatic organisms.

**N. Restricted Use Status**
Mycosin is not registered in the U.S.
pymetrozine (Chess, Fulfill, Plenum)

A. Registration status
Pymetrozine is a general use insecticide that is registered in the United States under the name Fulfill (registration no. 100-912). It is a Toxicity Class III insecticide with the signal word Caution. It is a relatively new insecticide introduced to some markets in 1993 and registered in the United States in 1999. Pymetrozine, under the trade name of Plenum, is not registered in Albania yet. Based on Regulation of Pesticide Use in Albania (Article 10) for experimental trials, Plant Protection Institute is allowed to use unregistered pesticides. The commercial product Plenum will be purchased in Italy.

B. Basis for selection
Pymetrozine is a low risk, highly selective, foliar insecticide with a unique mode of action that provides superior control of aphids and whiteflies with up to two weeks residual. It works mostly by ingestion, but has some contact activity as well. Pymetrozine belongs to the IRAC Class 9B (compounds of unknown or non-specific mode of action). It appears to cause neuromuscular perturbations that prevent homopteran insects from inserting their stylus into plant tissue. Aphids stop feeding soon after ingestion of Fulfill and die within ten days. Pymetrozine works through contact. Due to its low toxicity to beneficial insects, it can be used during periods of pollination. For this reason pymetrozine is suitable for integrated pest management (IPM) programs. In the United States, Fulfill (50% pymetrozine) is registered for controlling aphids. Pymetrozine is a better alternative than insecticides currently used in Albania to control whiteflies and aphids, and is widely used in the IPM programs in neighboring European countries. The U.S. EPA considers pymetrozine a preferred replacement product for organophosphates used for similar targets (EPA Pesticide Fact Sheet: Pymetrozine).

C. Extent to which the proposed pesticide is part of an Integrated Pest Management program
Pymetrozine product is a strong choice as part of an IPM program because it is very easy on beneficial insects and bees. It can be used for rotation purposes as well for resistance management.

D. Proposed method or methods of application, including availability of appropriate application and safety equipment.
Fulfill is a water-dispersible granule that can be applied as a foliar or aerial application. It has a 12-hour restricted entry interval and a 0-day pre-harvest interval. Standard PPE, including chemical-resistant gloves should be used for mixing, loading, application, and clean-up.

E. Acute and long-term toxicological hazards and risk avoidance
Pymetrozine has low acute toxicity to humans, other mammals, birds, aquatic organisms, and bees. It is practically nontoxic to rats orally (LD₅₀, male rats = 5693mg/kg) and slightly toxic dermally (LD₅₀ > 2000mg/kg). Via inhalation it is practically nontoxic (LC₅₀ > 3mg/L). PPE should be worn when mixing, loading, and applying this product. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided. Follow all user safety recommendations and agricultural user requirements listed on the label. Do not allow workers without the proper early re-entry PPE to re-enter treated area for 12 hours. Do not apply this product in a way that will contact workers or other persons, either directly or through drift.
**F. Effectiveness for the proposed use**  
Pymetrozine is effective against homopteran pests such as aphids and whiteflies.

**G. Compatibility of the proposed pesticide with target and nontarget ecosystems**  
Pymetrozine is very compatible with target and nontarget ecosystems as it has a very low toxicity profile, being essentially non-toxic to fish ($\text{LC}_{50}\text{trout} = 128\text{mg/L}$), aquatic invertebrates ($\text{LC}_{50}\text{Daphnia magna} = 87\text{mg/L}$), and birds ($\text{LD}_{50}\text{quail} >2000\text{mg/kg}, 8\text{-day dietary mallard and quail }\text{LC}_{50} > 5200\text{ppm}$). Pymetrozine is a good choice to maintain beneficial insect populations. It’s essentially non-toxic to bees ($\text{LC}_{50} > 117\mu\text{g/bee}$). There are also no issues concerning its environmental fate. It is strongly bound to soil particles and breaks down rapidly in the soil, thus posing no risk of leaching. It is rapidly degraded in water.

**H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils**  
Pymetrozine will be used in Albania to treat whiteflies on cucurbitaceous and solanaceous vegetables grown in plastic sheet-covered tunnels. These tunnels are constructed on alluvial soils where water the table is more than 2m down. These covered tunnels present an enclosed cropping system that is isolated from the local environment. Therefore, pesticide drift will be essentially nil. If it is demonstrated to be effective and economical compared to more toxic insecticides, then upon registration in Albania, it will be recommended for first consideration in situations when chemical control is determined to be necessary.

**I. Availability and effectiveness of other pesticides or nonchemical control methods**  
Pymetrozine is among the safest pesticides for controlling aphids and whiteflies. Other synthetic chemical pesticides may be equally effective, but may be more toxic. Cultural techniques can discourage the build-up of economically damaging populations of target organisms. Crop rotation, use of resistant varieties, and good field sanitation can discourage pest build-up. When chemicals must be used, a resistance management plan should be followed that limits the number of applications of a particular product and provides guidance on rotation of pesticides in different resistance classes.

**J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal**  
See Section IIB.

**K. Provisions made for training of users**  
Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for on-station and on-farm research. See Section IIA, Safe Use Action Plan.

**L. Provisions made for monitoring the use and effectiveness**  
Assessing the effectiveness of pymetrozine is the objective of proposed research.

**M. Mitigation of possible adverse effects**  
No adverse effects are anticipated with the use of pymetrozine. The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. Avoiding application near surface water or in conditions allowing runoff will minimize exposure of fish and other aquatic organisms.

**N. Restricted Use Status**  
Pymetrozine is not a U.S. EPA Restricted Use Pesticide.
**Pyrethrins and Piperonyl Butoxide (Pyrethrum) + canola oil**

**A. Registration status**
The USEPA has registered numerous formulations of pyrethrin and piperonyl butoxide (e.g. Registration No. 499-479, 4% pyrethrins and 4% piperonyl butoxide). These formulations typically have Toxicity class III with a signal word Caution. Canola oil is not a pesticide but a United States Food and Drug Administration approved food item. No label is required for the use of a non-toxic product. Pyrethrin is proposed for use in Moldova, but not proposed for use in Albania or Ukraine.

**B. Basis for selection**
Pyrethrin is an IRAC Group 3 insecticide that interferes with sodium channels of insect neurons. Pyrethrins control whiteflies, a major pest in greenhouses. It has a low toxicity to mammals. In combination with the synergist piperonyl butoxide, it is a commonly used household insecticide providing quick knock-down upon contact. The research institute in Moldova is making their own pyrethrin extract for use against whiteflies.

**C. Extent to which the proposed pesticide is part of an Integrated Pest Management program**
The product is compatible with an IPM program. Pyrethrins are an important class of insecticides that can be used within an insect resistance management plan. Within its chemical class, pyrethrin has relatively low toxicity to vertebrates, thus its common use as a household insect spray.

**D. Proposed method or methods of application, including availability of appropriate application and safety equipment.**
Pyrethrin will be applied as a foliar spray. Applicators will use appropriate PPE.

**E. Acute and long-term toxicological hazards and risk avoidance**
Pyrethrin/piperonyl butoxide poses no long-term toxicological hazards. Toxic levels of acute exposure are unlikely because of the relatively low toxicity to vertebrates (Oral LD$_{50}$ rat = 1500 to 2300mg/kg (Class III); dermal LD$_{50}$ rat = 1800mg/kg (Class III), 4-hour inhalation LC$_{50}$ rat = 3.4mg/L Class IV). PPE should be worn when mixing, loading, and applying this product. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided. The product must be applied such that it cannot be carried into bodies of water as irrigation runoff. Tank mixes and clean-up rinsate must not enter bodies of water or be disposed of near wells.

**F. Effectiveness for the proposed use**
Pyrethrin is an effective insecticide for quick knock-down with low persistence. It is used just before and during harvest when other pesticides may not be allowed.

**G. Compatibility of the proposed pesticide with target and nontarget ecosystems**
Pyrethrin is extremely toxic to fish (LC$_{50}$ = 5.2 to 10µg/L) and aquatic invertebrates (LC$_{50}$ Daphnia magna = 12µg/L). Care must be taken to ensure that the product does not enter bodies of water as runoff of spray drift. Bees are very sensitive to pyrethrin (LD$_{50}$ = 130 to 290ng/bee), but are also repelled by it. Application should be carried out when bees are not foraging.

**H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils**
Pyrethrin with oil will be used in Moldova to control whiteflies in tomatoes and cucumbers. These crops are grown in plastic sheet-covered tunnels constructed on alluvial soils where the
water table is more than 2m down.

| I. Availability and effectiveness of other pesticides or nonchemical control methods |
| Pyrethrin has a broad spectrum of insect species. It is therefore, versatile, but also can be substituted by a number of other products. It is especially useful as an application just before harvest when other insecticides cannot be used. Cultural techniques can discourage the build-up of economically damaging populations of target insects. Crop rotation, use of resistant varieties, and good field sanitation can discourage pest build-up. When chemicals must be used, a resistance management plan should be followed that limits the number of applications of a particular product and provides guidance on rotation of pesticides in different resistance classes. Pyrethrin is a mild member of its chemical class for use in resistance management plans where a pyrethroid is desired. |

| J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal |
| See Section IIB. |

| K. Provisions made for training of users |
| Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan. |

| L. Provisions made for monitoring the use and effectiveness |
| This product is being proposed for use as the object of research. |

| M. Mitigation of possible adverse effects |
| The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. Avoiding application near surface water or in conditions allowing runoff will minimize exposure of fish and other aquatic organisms. |

| N. Restricted Use Status |
| The U.S. EPA does not classify pyrethrin as a Restricted Use Pesticide. |
Reynoutria sachalinensis extract (Milsana, KH$_2$PO$_4$)

A. Registration status
The botanical extract of *Reynoutria sachalinensis* comes from the giant knotweed. This extract was registered as a biopesticide by the U.S.EPA in 2000 as Milsana (Registration No.11656-99) (5% *R. sachalinensis* extract). Milsana has Toxicity Class II with the signal word Warning because the carriers with which it is mixed can cause temporary but substantial eye injury. Extract from *Reynoutria sachalinensis* is currently registered in Moldova. It is not proposed for use in Albania or Ukraine.

B. Basis for selection
*Reynoutria sachalinensis* is a native plant of East Asia that has been introduced to Europe and North America. The extract induces plant defenses (phenols) against fungi in one to two days in the presence of light when sprayed on foliage. (EPA Fact Sheet 055809). Powdery mildew on cucumbers is a problem in greenhouses and open fields in Moldova. Powdery mildew (*Oidium* spp.) is the disease against which *R. sachalenensis* extract is most effective. An effective pesticide is needed to increase output and improve the quality of cucumbers. *R. sachalenensis* is proposed as a botanical fungicide that may be effective. In the United States Milsana is used as a foliar spray on greenhouse ornamentals.

C. Extent to which the proposed pesticide is part of an Integrated Pest Management program
The mineral oil/extract product is a novel mechanism of action that is compatible with insect resistance management programs. Mineral oil has low toxicity and there are no anticipated harmful environmental effects to its application.

D. Proposed method or methods of application, including availability of appropriate application and safety equipment
*R. sachalinensis* extract is applied as a dilute spray at approximately 0.5% v/v in a volume of 500 to 1000L/ha. The induction of plant defenses is not systemic. Sprayed foliage is induced, but new growth is susceptible and must be sprayed to become protected. Spray foliage until runoff every 7 – 10 days. It should not be applied with an irrigation system. The REI is 24h. Personnel may not enter greenhouses until the product has dried on foliage and the greenhouse has been ventilated. PPE as coveralls, water resistant gloves, shoes and socks. The Milsana formulation or any formulation similar to it requires protective eyewear.

E. Acute and long-term toxicological hazards and risk avoidance
The extract is not considered a hazard to humans or non-target animals (oral LD$_{50}$ rat > 5000mg/kg (Class IV), dermal LD$_{50}$rat > 2000mg/kg (Class III); inhalation LC$_{50}$ = 2.6mg/L Class IV). It is slightly irritating to eyes. Ingredients in the formulation of the extract could pose hazards to eyes, requiring wearing of eye protection when handling it. PPE should be worn when mixing, loading, and applying this product. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided. The product must be applied such that it cannot be carried into bodies of water as irrigation runoff. Tank mixes and clean-up rinsate must not enter bodies of water or be disposed of near wells.

F. Effectiveness for the proposed use
Powdery mildew (*Oidium* spp.) is the disease against which *R. sachalenensis* extract is most effective. It is also known to suppress *Botrytis* spp rots and may provide some suppression of *Xanthomonas* spp. bacterial diseases. The efficacy of the product will be tested as part of the
research program.

<table>
<thead>
<tr>
<th><strong>G. Compatibility of the proposed pesticide with target and nontarget ecosystems</strong></th>
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<tbody>
<tr>
<td>Ecotoxicology data are not available. They are not required by the U.S. EPA because of the botanical extract is natural product.</td>
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<tr>
<th><strong>H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils</strong></th>
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<tbody>
<tr>
<td><em>R. sachalimensis</em> will be used in Moldova to prevent powdery mildew in cucumbers. These cucumbers are grown in plastic sheet-covered tunnels constructed on alluvial soils where the water table is more than 2m down.</td>
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<table>
<thead>
<tr>
<th><strong>I. Availability and effectiveness of other pesticides or nonchemical control methods</strong></th>
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<tr>
<td>Testing the effectiveness of the non-toxic mode of action of the mineral oil/botanical extract against <em>Oidium</em> spp powdery mildews is the objective of the research. Traditional chemical fungicides can also be effective against powdery mildew. The proposed method, if successful, would reduce the number of chemical fungicide applications required and could become a product option within a resistance management plan for powdery mildew. In general, fungal disease management includes non-chemical techniques such as selection of disease-resistant varieties and good field sanitation. Proper plant nutrition, plant spacing, and proper crop rotation also can reduce the incidence and severity of disease.</td>
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<tr>
<th><strong>J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal</strong></th>
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<tr>
<td>See Section IIB.</td>
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<th><strong>K. Provisions made for training of users</strong></th>
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<td>Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan.</td>
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<tr>
<th><strong>L. Provisions made for monitoring the use and effectiveness</strong></th>
</tr>
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<tbody>
<tr>
<td>This product is being proposed for use as the object of research for finding low-toxicity alternatives to synthetic chemicals.</td>
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<th><strong>M. Mitigation of possible adverse effects</strong></th>
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<tr>
<td>With proper protection of applicators, no other adverse effects are anticipated. If the formulation components pose a hazard to eyes, eye protection should be added to the normal PPE required.</td>
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<th><strong>N. Restricted Use Status</strong></th>
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<tr>
<td><em>Reynoutria sachalinensis</em> extract is on the U.S. EPA’s list of active biopesticide ingredients.</td>
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</table>
**thiacloprid** (Calypso SC 480 by Bayer)

### A. Registration status
Thiacloprid is registered by the U.S. EPA as Calypso 4F (Registration No. 264-806) of Calypso SC 480 (40.4% thiacloprid) has Toxicity Class II, insecticide carries signal word Warning. Thiacloprid is a member of Insecticide Resistance Class 4A. It is labeled for use in the United States only on fruit trees, but it is used on fruit, vegetables, and cotton, elsewhere in the world (e.g. UK, Royal Horticultural Society, [http://www.rhs.org.uk/Advice/profiles0406/aphids.asp](http://www.rhs.org.uk/Advice/profiles0406/aphids.asp)). Thiacloprid is registered in Albania (Registration No. 197/24.12.2003) and Moldova. It is not being proposed for use in Ukraine.

### B. Basis for selection
Thiacloprid is a neonicotinoid in IRAC Class 4A. While sharing a common general mode of action with thiamethoxam, imidacloprid, and other neonicotinoids, there are differences in spectra of activity among insecticides in this class. Thiacloprid is one compound that must be tested against pests in Albania and Moldova. It is relatively more toxic than thiamethoxam, but less toxic than many other pesticides used for whitefly and aphid control. It will be evaluated in comparison with other materials in this pesticide class and commonly used more toxic, broad spectrum pesticides. Because if its higher toxicity than other neonicotynlys, it is not the preferred neonicotynl pesticide. However, efficacy among the proposed neonicotinyls must be compared before extension recommendations can be made. The pesticides that will be used for comparison are: Salut (chlorpyriphos-ethyl plus dimethoate) and Lannate 90WP (methomyl).

For purposes of resistance management, a limited number of insecticide applications are allowed in a field each season. Incorporation of neonicotinoids into the selection of pesticides makes insect resistance management easier, one objective of an IPM package. The final choice of neonicotinoids for a resistance plan will depend partly on its effectiveness.

### C. Extent to which the proposed pesticide is part of an Integrated Pest Management program
Thiacloprid is a better alternative than currently used products to control whiteflies, aphids, and mites – key pests of tomatoes and cucumbers. The neonicotinoids proposed here, including thiacloprid, will be a better fit in an IPM program through better survival of natural enemies. While having broad activity against pests, thiacloprid has minimal impact on beneficial/predator insects and is, therefore, a good component of an IPM package when chemical control is requires. Pesticides (thiacloprid) will be compared to the fungal entomopathogen *Beauveria bassiana* (Naturalis), the botanical extract azadirachtin and mineral oil.

### D. Proposed method or methods of application, including availability of appropriate application and safety equipment.
Thiacloprid is a systemic insecticide applied as a foliar spray. It cannot be used in irrigation systems.

Standard PPE must be worn when mixing, loading, applying, or cleaning up. PPE for this product is long-sleeved shirts and pants, chemical resistant gloves, shoes and socks. PPE will be provided as necessary by the project for on-station and on-farm research.

### E. Acute and long-term toxicological hazards and risk avoidance
The oral LD$_{50}$ for rats is 300-500 mg/kg, placing it in the toxic range. Thiacloprid may be fatal if swallowed. Dermal (LD$_{50} > 4000$mg/kg) and inhalation (4-hour LC$_{50}$rat = 2.2 to 8.8mg/L)
toxicity is very low. The use of PPE will help reduce applicator exposure. PPE should be worn when mixing, loading, and applying this product. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided.

F. Effectiveness for the proposed use
Thiacloprid is labeled for use on multiple food crops against aphids and is effective against many greenhouse pests. Efficacy data specific to host country conditions are to be generated in the proposed research. It is commonly used in the United States for similar purposes.

G. Compatibility of the proposed pesticide with target and nontarget ecosystems
Thiacloprid is only moderately toxic to fish and vertebrates when used according to the label. To avoid harmful effects on aquatic organisms, this product must not be applied in or near water where these organisms may be present and there is a low probability of exposure to these organisms in the proposed use.

H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils
Thiacloprid will be used experimentally to treat cucurbitaceous and solanaceous plants grown in plastic sheet-covered tunnels. These tunnels are constructed on alluvial soils where the water table is more than 2m down. These covered tunnels present an enclosed cropping system that is isolated from the local environment. Therefore, pesticide drift will be essentially nil. In Moldova they will be used in a temperate climate. If it is demonstrated to be effective and economical compared to more toxic insecticides, it will be recommended for situations when chemical control is determined to be necessary.

I. Availability and effectiveness of other pesticides or nonchemical control methods
While several aphicides and insecticides are locally available and commonly used, they are unlikely to be more effective or less hazardous to users and the environment than those pesticides in the neonicotinoid class (Class 4) This pesticide class was selected for testing several members as an alternative to the increasingly pest-resistant organophosphates and broad-spectrum pyrethroid pesticides. Non-chemical control methods (cultural, mechanical, and biological) are considered when developing an IPM program. Cultural techniques can discourage the build-up of economically damaging populations of whiteflies and aphids. Particularly important is conservation of natural enemies that keep aphids and whiteflies in check. Concurrent cropping patterns are important because adjacent fields can be a source for whiteflies to enter a crop or a sink for whitefly egress when a crop is harvested. When chemicals must be used, a resistance management plan should be followed that limits the number of applications of a particular product and provides guidance on rotation of pesticides in different resistance classes.

J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal
See section IIB.

K. Provisions made for training of users
Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan.
**L. Provisions made for monitoring the use and effectiveness**
The monitoring of key pests will involve one or more of the following: scouting, investigation of infestation level, and mortality and population levels through standard methods such as colored sticky traps. The effectiveness of thiacloprid will be the subject of IPM CRSP research before recommendations will be made.

**M. Mitigation of possible adverse effects**
The primary mitigating action of pesticide application is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. Avoiding application near surface water or in conditions allowing runoff will minimize exposure of fish and other aquatic organisms.

**N. Restricted Use Status**
Thiacloprid is not designated by the U.S. EPA as a Restricted Use Pesticide.
**A. Registration status**
Thiamethoxam is a general use insecticide registered in the United States as Platinum (Registration No. 100-939) (21.6% thiamethoxam) and Actara (Registration No. 100-938) (25% thiamethoxam) by Syngenta. It is a Toxicity Class III insecticide with a signal word Caution. Thiamethoxam is currently registered in Albania (Registration No. 164/26.12.2002) and Moldova. Its use in Ukraine is not proposed.

**B. Basis for selection**
The extended growing season afforded by field tunnels also provide a longer season for pest populations to develop and thrive. A large number of insecticides are used to manage insects in tomatoes and cucumbers. For purposes of resistance management, a limited number of applications of a particular insecticide are allowed. These applications need to be rotated with insecticides having a different mode of action. The neonicotinoids of thiamethoxam are considered to be low-risk tools for incorporation into IPM programs in rotation with other insecticides. Neonicotinoid insecticides affect nicotinic acetylcholine receptors of the nervous system. These receptors are more numerous in insect nerves than in vertebrates, so toxicity to vertebrates is moderate compared to insects. Once insects feed on the plant or come into contact with thiamethoxam, feeding and thus damage, ceases. Thiamethoxam has both contact and systemic activity against pests. The systemic activity allows it to be effective against sucking insects that do not feed on plant tissue surfaces. While sharing a common general mode of action, there are differences in the variety of target insects among insecticides in this class. Thiamethoxam is one neonicotinoid compound that must be tested against pests in Albania and Moldova. It will be evaluated in comparison with other insecticides in this pesticide class (e.g. imidacloprid and thiacloprid) and against traditional organophosphate and pyrethroid insecticides commonly used. Organophosphate insecticides are broad-spectrum insecticides whose use is declining in many countries because of increasing pesticide resistance and loss of registration. Pyrethroids are also broad-spectrum compounds that are often recommended to fill the gap left by organophosphates. Pyrethroids tend to be more harmful to beneficial arthropods than neonicotinoids, permitting secondary pest outbreaks.

**C. Extent to which the proposed pesticide is part of an Integrated Pest Management program**
Thiamethoxam is a better alternative than currently used products to control whiteflies, aphids, and mites – key pests of tomatoes and cucumbers. The neonicotinoids proposed here, including thiamethoxam, will be a better fit in an IPM program through better survival of natural enemies. While having broad activity against pests, thiamethoxam has minimal impact on beneficial/predator insects and is, therefore, a good component of an IPM package when chemical control is required. Pesticides (thiamethoxam) will be compared with the fungal entomopathogen *Beauveria bassiana* (Naturalis), the botanical extract azadirachtin and mineral oil is planned during the Eastern European Program. Azadirachtin is OMRI-certified in the US.

**D. Proposed method or methods of application, including availability of appropriate application and safety equipment.**
Thiamethoxam is applied as a foliar spray (Actara – a water dispersible granule) or to the soil (Platinum – a soluble concentrate). Because thiamethoxam is systemic and can be absorbed
through the roots, it can be applied through drip irrigation systems. Neither Actara nor Platinum should be used in greenhouses. Runoff risk can be avoided by applying when rain is not forecast for 48 hours.

Standard PPE must be worn when mixing, loading, applying, or cleaning up. PPE for this product is long-sleeved shirts and pants, chemical resistant gloves, shoes and socks.

E. Acute and long-term toxicological hazards and risk avoidance

Thiamethoxam is practically non-toxic via oral (LD$_{50}^{rat} > 5000$mg/kg), slightly toxic via dermal (LD$_{50}^{rat} > 2000$mg/kg), and practically non-toxic via inhalation (4-hour LC$_{50}^{rat}$ = 2.79µg/kg) routes of exposure. It is mildly irritating upon eye contact. Thiamethoxam is not known to cause reproductive or developmental problems, or be a mutagen.

PPE should be worn when mixing, loading, and applying this product. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided.

F. Effectiveness for the proposed use

Thiamethoxam is effective against aphids, whiteflies, planthoppers, thrips, and a variety of beetles. Thiamethoxam is labeled for use on multiple food crops against aphids and whiteflies. Efficacy data specific to conditions in Albania and Moldova are to be generated in the proposed research.

G. Compatibility of the proposed pesticide with target and nontarget ecosystems

Thiamethoxam is practically non-toxic to fish (LC$_{50}$ = 100ppm) and some aquatic invertebrates (Daphnia magna LC$_{50}$ = 114ppm). It is toxic to shrimp (LC$_{50}$mysid = 6.9mg/L). It is highly toxic to bees (contact LD$_{50}$ = 0.024µg/bee). Thiamethoxam has moderate (LD$_{50}$mallard = 576mg/kg) to insignificant (LD$_{50}$quail >5200mg/kg) acute oral toxicity to birds and is practically non-toxic subacutely. Exposure to aquatic organisms will be minimal for use proposed in covered field tunnel rows. Actara is a selective insecticide having low impact on beneficial arthropods apart from bees. It is not toxic to bees three to four hours after spraying. Precautions should be taken not to apply thiamethoxam during peak activity of bees and to keep it away from water bodies. Thiamethoxam breaks down in the soil and is only partially mobile. It is stable in water. Precautions should be taken prevent contamination of water bodies either by runoff or drift. Thiamethoxam has properties similar to molecules that can leach into groundwater. Because it persists in the environment for several months, it should not be applied where saturation of soils permits leaching into shallow groundwater.

H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils

Thiamethoxam will be used experimentally to treat cucurbitaceous and solanaceous plants grown in plastic sheet-covered tunnels. These tunnels are constructed on alluvial soils where the water table is more than 2m down. These covered tunnels present an enclosed cropping system that is isolated from the local environment. Therefore, pesticide drift will be essentially nil. In Moldova they will be used in a temperate climate. If it is demonstrated to be effective and economical compared to more toxic insecticides, it will be recommended for situations when chemical control is determined to be necessary.

I. Availability and effectiveness of other pesticides or nonchemical control methods

While traditional insecticides are widely available in Albania and Moldova, none are likely to be more effective or less harmful than those pesticides in the neonicotinoid class. The very low toxicity of thiamethoxam to workers makes it desirable when a chemical pesticide is required. Other members of the neonicotinoid insecticides can control the same target insects
with similarly favorable ecotoxicological profiles. Thiamethoxam is less hazardous than many carbamates, organophosphates, and pyrethroids which it can replace. Thiamethoxam was selected as an alternative to the increasingly pest-resistant organophosphates and broad-spectrum pyrethroid pesticides. One of the most important non-chemical means of managing whiteflies and aphids is preserving their natural enemies. Predatory insects are usually killed by broad-spectrum insecticides that are sprayed to kill whiteflies and aphids. Thiamethoxam is relatively benign to these beneficial insects, thereby reducing the need to repeat pesticide treatments when populations reach treatment threshold levels.

Cultural techniques can discourage the build-up of economically damaging populations of target organisms. Crop rotation, use of resistant varieties, and good field sanitation can discourage pest build-up. When chemicals must be used, a resistance management plan should be followed that limits the number of applications of a particular product and provides guidance on rotation of pesticides in different resistance classes.

| J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal |
| See Section IIB. |

| K. Provisions made for training of users |
| Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan. |

| L. Provisions made for monitoring the use and effectiveness |
| The monitoring of key pests will involve one or more of the following: scouting, investigation of infestation level, and mortality and population levels through standard methods such as colored sticky traps. The effectiveness of thiamethoxam will be the subject of IPM CRSP research before recommendations will be made. |

| M. Mitigation of possible adverse effects |
| The primary mitigating action is ensuring applicators are properly trained in safe use and have knowledge about proper use of the specific product. |

| N. Restricted Use Status |
| Thiamethoxam is not a Restricted Use Pesticide. |
Trichoderma lignorum (Preparation Trichodermin BL)

A. Registration status
Trichoderma lignorum is not registered in the United States. Trichoderma species for similar uses are U.S. EPA registered. There are several formulations and three strains of the fungal biopesticide Trichoderma harzianum that have been registered in the United States. There are two current registrations: PlantShield (Registration No. 68539-4) and RootShield (Registration No. 68539-3), both being different formulations of T. harzianum Strain T-22. Trichoderma is a cosmopolitan soil fungus with no known pathogenicity to vertebrates. T. harzianum has Toxicity Class IV for acute oral toxicity and acute inhalation toxicity. It is Toxicity Class III for dermal toxicity and skin irritation (U.S. EPA, April 2007. Trichoderma Species Review Document: Final Review). Trichodermin BL is a preparation of T. lignorum that is widely available in the former Soviet Union and Eastern Europe. Trichoderma lignorum is currently registered in Moldova. The product being proposed is an Eastern European isolate of the species T. lignorum [Trichoderma viride] isolate T 13-82. It is not proposed for use in Albania or Ukraine.

B. Basis for selection
Trichoderma spp are naturally occurring soil fungi found throughout the world. As a biopesticide they are inoculated at high concentrations onto plant roots or in the soil to provide protection against root plant pathogens. They actively infect and parasitize soil-residing plant pathogenic fungi. They can also excrete substances that can induce a plant’s natural defense mechanisms. Trichoderma spp. biopesticides are inhibitors of a variety of root diseases of vegetables. The efficacy of T. lignorum will be tested under local conditions. In the Eastern Europe program, the biopesticide will be used against root rot in greenhouses in Moldova.

C. Extent to which the proposed pesticide is part of an Integrated Pest Management program
Trichoderma spp., being microbial soil fungi with no known adverse non-target impacts are a first choice consideration when management of root pathogenic fungi must be used. Well known, the Trichoderma spp. are used around the world to protect plants from root diseases.

D. Proposed method or methods of application, including availability of appropriate application and safety equipment.
Trichoderma is applied to soil, seeds, or seedlings as a drench or in-furrow application as powder or liquid in the field, greenhouse, or nursery. It can be used in both the form of a granule or that of a powder. The granule form is usually applied dry to soil, while the powder is placed in an aqueous suspension that requires tank agitation before application. Trichoderma is compatible with drip irrigation systems. When seed diseases or seedling rot is expected in the field, chemical fungicides may be desirable for initial control, with Trichoderma used for long-term control after seedling establishment. There is a 0-day REI and 0-day PHI. Because Trichoderma is itself a fungus, fungicides used on the same crop should be selected from those that are designated on the label as compatible with Trichoderma. Trichoderma poses little risk to applicators; nevertheless, standard PPE should be worn.

E. Acute and long-term toxicological hazards and risk avoidance
Trichoderma has no activity against vertebrates. No adverse affects from Trichoderma have
been reported to the U.S. EPA. Experiments with lab animals *Trichoderma* biopesticides are considered practically non-toxic, non-allergenic, and non-pathogenic to mammals. There are no toxicological hazards associated with these products. Allergic reactions could be possible in some individuals if a large amount of unmixed dry material is inhaled. Dermal toxicity tests were waived based on reports on worker exposure giving it a default Toxicity Class of III (U.S. EPA, April 2007. *Trichoderma* Species Review Document: Final Review). PPE should be worn. By ensuring that all applicators and handlers are properly trained and adhere to all advisory information in the label, adverse effects to people and the environment can be avoided.

**F. Effectiveness for the proposed use**

*Trichoderma* spp. are mycoparasites effective against soil pathogens effective against diseases such as *Pythium*, *Rhizoctonia*, *Fusarium*, *Cylindrocladium*, and *Thielaviopsis*. They are also effective against *Botrytis* rots when applied as a foliar spray in greenhouses.

**G. Compatibility of the proposed pesticide with target and nontarget ecosystems**

*Trichoderma* spp. are considered a benign addition to a production system having no adverse impact on the environment. *T. harzianum*’s mode of action has no impact on vertebrates and invertebrates and plants (U.S. EPA, April 2007. *Trichoderma* Species Review Document: Final Review). No adverse nontarget effects are anticipated by the use of this biopesticide. The fungus can stimulate root growth in plants and increase their efficiency in nutrient absorption.

**H. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils**

*Trichoderma* will be used to suppress soil plant pathogens in field horticulture in Moldova.

**I. Availability and effectiveness of other pesticides or nonchemical control methods**

Chemical fungicides may be effective against diseases controlled by *Trichoderma* spp. Being a biopesticide of extremely low risk and being a product that can provide long-term control of soil diseases, *Trichoderma* spp are a preferred when feasible.

**J. Requesting country’s ability to regulate or control the distribution, storage, use, and disposal**

See Section IIB.

**K. Provisions made for training of users**

Experienced, trained applicators will be selected. Plant protection specialists are holding information transfer sessions among users as part of the regional IPM CRSP project. At these transfer sessions, applicators are instructed on proper solution preparation and application techniques, and informed of precautionary steps in dealing with this pesticide, including handling, storage, and first aid. PPE will be provided as necessary by the project for its on-station and on-farm research. See Section IIA, Safe Use Action Plan.

**L. Provisions made for monitoring the use and effectiveness**

Determining effectiveness of Trichodermin BL is the objective of the research.

**M. Mitigation of possible adverse effects**

No adverse effects are anticipated.

**N. Restricted Use Status**

*Trichoderma* spp have been registered in the U.S. as biopesticides under a system different from chemical pesticides. These fungi are not Restricted Use Pesticides.
II. Safe Use Action Plan

A. Ensuring Safe Use

In Ukraine these programs are offered by individual states (oblasts) with varying levels of availability. Pesticides that are being proposed for possible extension recommendations are all General Use Pesticides in the United States, requiring no certification of applicators. Some pesticides commonly used in these countries, such as abamectin and methomyl, are Restricted Use Pesticides, requiring certified applicators for use in the United States. Therefore, substituting these less toxic pesticides in place of more toxic ones will increase safety margins for pesticide handlers and field workers.

Albania has two certification programs. The month-long certification program for pesticide dealers is done every two or three years in the Plant Protection Institute. The pesticide dealers get information about arthropod and disease control in the main crop in Albania, as well as pesticides and their modes of action, risks to health and the environment from pesticides and general information about principles and regulation of pesticide use.

The certification program for applicators is organized in several Regional Departments of Agriculture. There the applicators receive information about pesticides application procedures (selectivity, toxicity and dose of application), regulation of pesticide use in Albania, plant protection laws, and about the danger in the case of misuse of pesticides. The certificate is valid for 5 years.

Our personnel in Moldova are contributing to a planned applicator training program, although their institute has no formal extension responsibility.

For research trials all applicators and handlers will be properly trained and will observe all advisory information according to pesticide labels. Applicators will be under the supervision of project personnel. Application will not be made during adverse weather that would facilitate drift of residue runoff or in a manner that poses a threat to waterways or irrigation systems.

B. National Pesticide Regulation

The Regulation of Plant Protection Products (PPP) is adopted according to EU regulations. Albania’s Ministry of Agriculture, Food, and Consumer Protection, Moldova’s Ministry of Agriculture and Food Industry, and Ukraine’s Ministry of Agriculture have jurisdiction over distribution, storage, and use of pesticides. Registration of pesticides is contingent upon toxicological and efficacy studies, among other studies. Improper pesticide use constitutes any use not consistent with the label. Growers in the region have demonstrated poor pesticide management practices, a
problem that will be addressed through our project. Research facilities and cooperating growers will observe good practices as models for other growers.

Attached is an example of national pesticide regulation in our region, legislation passed by the People’s Assembly in Albania (Annex 1).
“PLANT PROTECTION SERVICE”

On the basis of articles 78, 81 item 1, 83 item 1 of the Constitution, under the proposal of the Council of Ministers, the People’s Assembly of Albania decided:

CHAPTER I

GENERAL PROVISIONS

Article 1

Objective

The objective of this law is:
To ban the entrance and spread of pests in the territory of Albania.
To protect plants and plant products from pests.
To protect the human and animal health and environment from the use of Products for Plant Protection (PPP).
To ensure the implementation of the international agreement in the field of plant protection.

Article 2

Definitions

The terms that appear in this law imply as follows:

“Inspector” implies the inspector of plant and quarantine protection.

“Pest” implies the damager, the illness, the harmful weeds notorious for damaging plants and plant products.

“Quarantine Pest” implies a dangerous pest that damages the country’s economy, which has not yet been observed or has been observed but isn’t widely spread.
“PPP” implies any kind of product that contains one or more chemical substances that are used:
To protect the plants and plant products from pests or prevent the pests activity.
To affect the vital plant processes, but have a different action from the chemical fertilizers (ex. The regulators of growth).
To destroy the unpleasant weeds, parts of plants. To keep under control or prevent the growth of unpleasant parts of plants.

“Recording” implies the approval for trade and use of a PPP from MoFA based on the assessment of the scientific data, which certify that the PPP is effective in the purposes of use, and is not harmful to the people, animals or environment.

“Area” implies the territory or part of it that is officially named (village, commune, municipality, prefecture).

“Wastes of PPP” implies one or more acting substances that are present in a plant, products of plant origin, edible products of animal origin and environment because of the use of the PPP including the metabolism and products that emerge from their decomposition.

“Plant protection” implies the protection of plants from the damages caused by pests.

“Integrated protection” implies the combined and rational use of biological, biotechnical, chemical measures and farming techniques that limit the use of PPPs at the minimum to keep the pest populations at an acceptable economic damage.

“Certifying the reproductive material” implies a procedure in which the mother plants, nominated to provide the reproductive material pass through analyses and special treatments, when necessary, to ensure the purity from pests and other similar organisms.

“Good practices of plant protection” implies the whole fighting chemical measures of pests estimating the conditions under which the PPPs are recorded such as: the critical limits, selecting the doze and volume, the time and number of treatments, the protection of the natural entomofauna and environment and the care for users and consumers health.

“Other objects” implies the place of preservation, the means of transport, the containers, the soil, the living organisms suitable to shelter or spread pests in international transit passages in particular.

“Plant” implies living plant or parts of plants including the seeds and germplasm.

“Contraction of infection” implies the presence of living pests in plants, plant products or other objects.
“Inspection” implies the official, visual examination of plants, plant products or other objects in order to determine to see whether they have contracted pests or comply with the provisions of this law.

“Plant quarantine” implies a series of acts that impedes the entrance and/or the spread of a quarantine pest or insures the official inspection of the pest.

“Border entrance post” implies the airport, the seaport and entrance by land that are officially defined for the entrance of plants, plant products or other objects.

“Plant product” implies the natural (cereals included) and manufactured material of plant/vegetable origin, which can be perilous for their very nature and method of manufacturing.

“Treatment” implies a certified, official procedure for the death, removal or the process of making pests infertile.

“Phytosanitary Certificate” implies an official document issued by the nation authority of the plant protection service, which shows that the phitosanitary conditions of pants, plant products or other objects meet the conditions determined by the importing country.

“Special fighting measures” imply a series of quarantine, chemical, agro technical measures taken in the case of massive growth and spread of pests. The measures aim to reduce the infection under the level of economic damage or to eradicate it completely.
CHAPTER II

ORGANIZATION AND FUNCTION OF THE RESPONSIBLE STRUCTURES OF THE PLANT PROTECTION SERVICE

Article 3

The Plant Protection Service is run by the MoFA through the Directorate of Plant Protection Service.

Article 4

The Directorate of Plant Protection Service is the body that runs and follows up the practical and scientific implementation of this service though:
- The Inspectorate of the Plant Protection Service and the secretariat of PPP recording close to this directorate.
- The Institute of Plant Protection, an institution that conducts scientific researches and serves as a national point of reference to the implementation of the law.
- The director of the Directorate of Plant Protection Service is the head inspector of the service.

The Directorate of Plant Protection Service cooperates and coordinates its work with the General Directorate of Standardizing to adapt the international and European standards to the field of Plant Protection Service.

Article 5

The State Commission of PPP Recording (SCPPPR) operates close to the Directorate of Plant Protection Service.

The content, rights and duties of this Commission are determined by a DCM following the proposal of MoFA.

Article 6

The Plant Protection Service in Regional Directorates of Food and Agriculture in prefectures operates through:

- The Inspectorate for Plant and Quarantine Protection
- The Laboratory of Plant Protection
Article 7

The organization and functioning of the Plant Protection Service is determined by DCM under the proposal of MoFA.

CHAPTER III

PEST FIGHTING

Article 8

The producers, the physical and juridical entities that farm, produce, store, manufacture and trade plants and plant products are obliged:
To take preliminary measures against pests and impede their reproduction and spread.

To watch the land and plant products against pests and fight them according to the Good practices of plant protection and the criteria of integrated protection.

Article 9

In the budget annually approved for the MoFA there are special funds regarding the protection of the cultivated or spontaneous plants against the pests.

The Minister of Food and Agriculture issues regulations against the pests, the fighting of which will be covered by these funds.

Article 10

In urgent cases of increase and spread of pests that cannot be restricted with the usual fighting measures, the Minister of Food and Agriculture issues regulations that determine the special measures to fight them. Thus he activates governmental and private subjects who own the necessary human and material capacities.

The expenses are covered by the annual budget of MoFA.

Article 11

Vegetable material needed in reproduction or sowing is allowed to be used after they have undergone the phytosanitary inspection and are equipped with the phytosanitary certificate.
The fruit-tree species and the grapevine that reproduce in a vegetative way under the procedures of certifying the reproductive material to ensure the purity from viruses and other similar organisms.

Article 12

The guidelines of the Minister of Food and Agriculture determine the fight against pests in details.
CHAPTER IV

PHYTOSANITARY QUARANTINE INSPECTION

Article 13

The import, export and the passage in transit in the territory of Albania of plants, plant products and other objects occurs at custom entrance posts approved by DCM in which the phytosanitary quarantine inspection operates and they undergo this inspection.

Article 14

It is forbidden:

The import, export and the passage in transit in the territory of Albania of plants, plant products and other objects that have contracted pests.

The import, export and the passage in transit in the territory of Albania of plants, plant products and other objects unless they are equipped with the phytosanitary certificate.

The reproduction and farming of plants that have contracted pests.

Article 15

To enforce this law, the inspectorate at the customs entrance posts cooperates with the border police; customs officers; traffic, railway and sea agencies; the harbour office; the governmental health and veterinary inspectorate.

It is part of the customs practice group that takes the first contact with the means that transport plants, plant products and other objects.

Article 16

Whenever the producers, the physical and juridical entities that farm, produce, store, manufacture and trade plants and plant products observe or suspect a pest or its massive reproduction not previously encountered in an area are obliged to inform the authorities of Plant Protection Service and provide a pest sample.

Article 17
Whenever a quarantine pest appears in an area, the MoFA declares it as a contaminated area and determines the measure to be taken to restrict its spread till its complete eradication.

Article 18

The order is made known to the authorities of the local power, the producers, the physical and juridical entities that farm, produce, store, manufacture and trade plants and plant products.

Article 19

The inspector stops the plants and plant products and other objects in cases he sees the law is broken. The State Police offers the inspector its assistance.

Article 20

The preservation and reproduction of quarantine pests for research and experimental purposes is allowed by an approval of the MoFA.

Article 21

Detailed regulation regarding the phytosanitary quarantine inspection are determined by DCM under the proposal of MoFA.
CHAPTER V

PRODUCTS FOR PLANT PROTECTION PPP

Article 22

Recording/Logging

All PPPs to be used for phytosanitary purposes in the territory of Albania undergo the recording/logging procedure held by the Directorate of Plant Protection Services.

PPPs of inorganic origin and those of herbal extracts do not undergo the procedure.

Article 23

The institutes that assess PPPs during the recording procedure are as follows:
Institute of Plant Protection that makes the biological and agronomical assessment;
Institute of public health that makes the medical and toxic assessment in people;
Institute of Veterinary researches that makes the medical and toxic assessment in animals;
Ministry of Environment that makes the assessment of the impact on the environment.
The recording/logging rules and assessment criteria of PPPs by the institutes mentioned in item 1 of this article are determined by DCM, under the proposal of MoFA, MoH, MoE.
Article 24
Trade and import

The trade and import of the recorded/logged PPPs and those of inorganic origin and of herbal extracts is permitted.

The import of the recorded/logged PPPs is carried out by a Permission of Import issued by the director of the Directorate of Plant Protection Services on the basis of a proposal by the Commission established for the purpose.

The trading of the recorded/logged PPPs is carried out by a Permission of Trade issued by the director of the Regional Directorate of Food and Agriculture on the basis of a proposal by the Commission established for the purpose.

Article 25
Transport, preservation and use

PPPs are transported in their original packing in safe and suitable means of transport.

PPPs are preserved in special places that serve the purpose, away from the urban and public areas so as to avoid the negative effects on the environment.

PPPs are used according to the requirements and guidelines present in the recording/logging document.

Article 26
Qualification

All right to import and trade PPPs are reserved to the people graduated at the Faculty of Agronomy or to those that employed such staff.

Particular PPPs are used only by the people mentioned in item 1 of this article and by those instructed and equipped with an ability certificate.

Article 27

Rules on the import, trade, transport, preservation, use and eradication of PPPs are determined by the DCM, under the proposal of MoFA.
CHAPTER VI

ADMINISTRATIVE INFRINGEMENT

Article 28

Administrative Infringement

When not classified as a penal act, the following offences are considered Administrative Infringements of the law provisions:
Non-implementation of the requirements in article 8 by the producers and the physical and juridical entities.

Non-implementation of the requirements in item 1, article 10 by the governmental and private entities.

Use of plant material in plant reproduction or sowing without first undergoing the phytosanitary inspection or equipment with the phytosanitary certificate which is contrary to item 1, article 11.

The import, export and the passage in transit in the territory of Albania of plants, plant products and other objects contrary to the requirements of article 13.

The import, export and the passage in transit in the territory of Albania of plants, plant products and other objects as well as the reproduction and farming contrary to the requirements of article 14.

Non-respecting the obligation of informing the authorities when a new pest appears and spreads contrary to the requirements of article 16.

Use of PPPs in the territory of Albania contrary to the requirements of item 1, article 22.

Import and trade of PPPs contrary to the requirements of article 24.

Import and trade of PPPs contrary to the requirements of item 1, article 26.

Transport, preservation and use of PPPs contrary to the requirements of article 25.

Use of particular PPPs contrary to the requirements of item 2, article 26.

Article 29

Sanctions/Penalties
In cases of infringements envisaged in items 1, 2 and 6 of article 28 the Inspectorate fines subjects by a 5,000 ALB penalty.

In cases of infringements envisaged in items 3, 4, 5, and 11 of article 28 the Inspectorate fines subjects by a 10,000 ALB penalty.

In cases of infringements envisaged in items 10 of article 28 the Inspectorate fines subjects by a 15,000 ALB penalty.

In cases of infringements envisaged in items 7, 8 and 9 of article 28 the Inspectorate fines subjects by a 20,000 ALB penalty.

**Article 30**

**Procedures in cases of administrative infringements**

The Inspector reserves the right of administrative measure determined in article 28.

The Inspector decision can be appealed by a written complaint to the Director of Plant Protection Service within 5 days of the decision taking and declaring. The Director of Plant Protection Service should answer the complaint within 10 days of its notification.

A complaint against the Director of Plant Protection Service can be filed in the district court within 5 days of the decision-making.

**Article 31**

**Decision execution**

The decision is executed according to the procedures determined in article 19 and 20 of law no. 7697, dated 07.04.1993 “On administrative infringement”. 
CHAPTER VII

LAST PROVISION

Article 32

Acts

The Council of Ministers is in charge of issuing legal acts for the implementation of article 7, 21, 27 and 31.
The Council of Ministers is in charge of issuing legal acts for the implementation of article 12.

Article 33

Law no. 7662, dated 19.01.1993 on “Plant Protection Service” and law no. 8529, dated 23.09.1999 “Annexes and amendments on law no. 7662, dated 19.01.1993 on “Plant Protection Service” are repealed.

Article 34

This law enters in force after the publication in the Official Gazette.

HEAD OF THE PEOPLE’S ASSEMBLY

SERVET PELLUMBI