

**Popova Kula Winery Model Comprehensive Pesticide Use Plan
for Popova Kula Winery to Implement
(and AgBiz Project Staff to Oversee)**

The following is a model plan of recommendations for Popova Kula Winery and farmers to mitigate risks and implement agriculture best management practices (most of which are also GlobalGAP certification requirements) where pesticide use is involved. It will provide a model for other AgBiz beneficiary companies to use to produce their own Comprehensive Pesticide Use Plan. And, it begins with findings and recommendations found in the EDD/PPA for Popova Kula Winery.

Following the EDD/PPA for Popova Kula Winery, the following apply

Application of pesticides on the vineyards currently is managed by the winery itself; however, pending a decision for increase of the vineyard estate, it is planned to outsource the entire vineyard management activity to a specialized agriculture extension company, which will be in charge for quality and origin of used pesticides, quantity and timing of pesticide application.

EDD Liability and Environmental Concerns: The principal EDD concern is that Popova Kula purchases pesticides for farmers. Popova Kula must provide annual pesticide training. This training must cover proper handling and use of pesticides, pesticide mixing and application rates, disposal of unused pesticide and package disposal. In addition, a Pesticide Evaluation Report and Safe Use Action Plan (PERSUAP) is being conducted by AgBiz and the results will be used by Popova Kula to develop a comprehensive pesticide use plan.

There are no other significant liabilities or environmental concerns from the EDD. There is little waste, and a small amount of equipment cleanup wastewater is discharged intermittently throughout the year to either a new wastewater treatment system or to the municipal sewer system. Even if they treat the wastewater themselves and use the effluent for irrigation, because of the amount and characteristics of the wastewater, this effluent should not cause any significant liability concerns for soils or groundwater contamination.

Mitigation and Monitoring Recommendations: There are no significant liabilities or environmental concerns from the EDD and PPA. Mitigations include the following:

- Pesticides. Popova Kula purchases pesticides for farmers. Popova Kula must provide annual pesticide training. This training must cover proper handling and use of pesticides, pesticide mixing and application rates, disposal of unused pesticide and package disposal. In addition, a Pesticide Evaluation Report and Safe Use Action Plan (PERSUAP) is being conducted by AgBiz and the results will be used by Popova Kula to develop a comprehensive pesticide use plan.

Note that many of these recommendations, with the possible exception of specific particularly toxic pesticides—*most of which have less toxic alternatives available*—are already being implemented by Popova Kula as they prepare for GlobalGAP certification. Although farmers who supply Popova Kula will grapes currently use whatever pesticides they wish, Popova Kula

is planning to advise farmers on the best inputs package, which will include pesticides. As this commences, it is recommended that Popova Kula also provide training for farmers in best practices, which are located below.

Special attention needs to be focused on problematic pesticide active ingredients—many of which, especially Class I acute toxins, are being phased out of use by EU regulations, identified immediately below. Many of the products registered for use in 2005/06 are still present in farm stores, regardless of 2007/08 registration status, as they clear the retail system, and are thus analyzed by this PERSUAP for risk and inordinate risk.

Immediately and Continuously

- Do not use **WHO Class Ia or Ib and/or EPA Class I** and other risk-prone products containing the following active ingredients on AgBiz beneficiary farms, due to inordinately high risk to farmers, their families and bystanders: **Insecticides** azinphos-methyl, dichlorvos (DDVP), endosulfan, methomyl, monocrotophos, oxamyl, oxydemeton-methyl, parathion, terbufos; **Miticide** fenazaquin; **Fumigants** aluminum phosphide (used as fungicide), zinc phosphide (used as rodenticide); and **Herbicide** paraquat.
- Do not use products containing active ingredients with **WHO and/or EPA Class II** (see Table 1, MSDS, Label) acute toxicity ratings *until* farmers have received sufficient (to set or change behavior in favor of best safe use practices) safety training and use PPE.
- Do not use products containing active ingredients not registered (and thus not tested for acute and chronic toxicity, or cancelled due to issues) by EPA: **Insecticides** cartap hydrochloride, omethoate, parathion, phoxim, quinalphos, teflubenzuron; **Fungicides** benalaxyl, benomyl (benlate), bitertanol, dinocap, fluquinconazole, flusilazole, iprovalicarb, metominostrobin, oxadixyl, prochloraz, procymidone, propineb, tolylfluanid, zineb; **Herbicides** amidosulfuron, chlorotoluron, cycloxydim, dichlormid, dichloroprop-P, difenzoquat, florasulam, flurochloridone, tepraloxymid, tritosulfuron; **Rodenticide** flocoumarfen.
- Use products containing the following Active Ingredients—designated as **Restricted Use Pesticide (RUP)**—only following the mitigation measures for RUPs shown immediately below: **Insecticides** alpha cypermethrin, azinphos-methyl, beta-cyfluthrin, bifenthrin, chlorpyrifos (ethyl), cypermethrin, deltamethrin, diazinon, diflubenzuron, endosulfan, esfenvalerate, fenthion, fipronil, gamma cyhalothrin, lambda cyhalothrin (also used on mites), oxamyl, oxydemeton-methyl, parathion, tau fluvalinate, terbufos, zeta cypermethrin; **Fumigants** aluminum phosphide (used as fungicide), zinc phosphide (used as rodenticide); **Herbicides** alachlor, diclofop-methyl, paraquat; **Molluscicide** methiocarb.

Mitigation of RUP risks in Macedonia

Training/Repeated Message Enforcement: For RUPs that pose a risk to the environment and natural resources, as well as those that pose a risk to human health, training is the best method for enforcing the message that certain targeted pesticides need to be used with care near (especially) aquatic environments.

Paid/Free Applicator Certification: Macedonia does not (yet) have pesticide applicator certification systems set up, so this measure would not likely work well until they do. Popova Kula can set up its own certification system for farmers who might use RUP pesticides, and perhaps associate it with GlobalGAP certification.

During this spraying season-to the end of September 2008

- For Popova Kula farmers to use the accepted (allowable) pesticide products in the short term, users will require training and refresher training in pesticide choice and safe use, if this has not yet occurred—emphasizing which products are recommended and which should not be used, and why. Note that a Popova Kula-developed specialized training plan for this purpose is provided at the end of this section.
- Popova Kula obtain from pesticide importers/distributors Material Safety Data Sheets (MSDSs) for pesticide products that will be used extensively on project crops, choose and recommend that their farmer suppliers use pesticides with low human and environmental risk profiles (see decision matrix in Table 1, MSDSs, and Labels).
- Popova Kula has already produced a quick reference guide for all of the anticipated major or primary pests/production constraints of grapes, GAPs and IPM measures that can be used to strengthen and protect the crop, soil and water, and pesticides to be used for each anticipated pest and condition, with use rates. In addition Popova Kula can emphasize pesticide-specific safety measures, regular pesticide rotation, environmental concerns, restricted entry interval (REI), pre-harvest interval (PHI), and minimum/maximum residue levels/limits (MRLs) for export and local consumption.
- During pesticide safety training of beneficiaries and their farmers, include additional pesticide selection factors such as environment and human safety in the discussion, using information and materials in this PERSUAP, material found in MSDSs and pesticide labels, and material found on pest management websites can emphasize the importance of these additional pesticide selection factors.
- Popova Kula has already identified an agronomist who will ensure the proper storage, use and maintenance of PPE. This involves making sure that the equipment is cleaned and checked for damage regularly, that the equipment is not taken away from the farm, and that workers are correctly using the equipment. This practice needs to be encouraged among farmers that produce and supply Popova Kula with grapes.

October to November 2008

- IPM tools and tactics may ultimately reduce the need for the quantities of pesticides used presently. For Popova Kula and supplier farmers to learn about IPM techniques being used in developed and other countries, at the end of this field season provide training and refresher training introducing these IPM practices as possibilities for future season use.

Continuously

- Popova Kula works with groups linked to farm stores that have received and utilize best practices training, and sources pesticides from the most reputable and reliable pesticide companies. This should continue.
- Popova Kula agronomist should perform basic simple economic analyses comparing pesticides to determine the most effective choice—while simultaneously selecting pesticides with low health and environmental impact potential.
- Popova Kula promote the use of more microbial, botanical pesticides and biological control parasites and predators, as practical.
- Popova Kula ensure that protective clothing (carbon-filter respirator mask, gloves, long-sleeved shirt and pants or Tyvec outfit, boots, and goggles if indicated on the label) are recommended to grape supply farm workers involved with pesticide use. This clothing should be carefully selected to provide an optimum balance of worker comfort and protection.
- Popova Kula set out a schedule for continuous training in safe handling and use of pesticides – including aspects such as types and classes of pesticides, human and environmental risk associated with pesticides, use and maintenance of PPE, monitoring for the development of pesticide resistance, understanding information on labels, proper collection and disposal of rinsate and packaging, the importance of keeping children away from the field while spraying is occurring and kept out after spraying has occurred, to avoid using pesticides in or near national parks where endangered species are known to exist, and waterways leading to any of Macedonia's lakes, ensure pesticide applicators continue to respect laws associated for notification of beekeepers about spray activities, and utilize pesticides with low ground water contamination potential (see Table 1) where water tables are high or easy to reach.
- Popova Kula uses and can emphasize GAP techniques that should be employed to reduce farm erosion (such as employing ground covers between vine rows, planting rows perpendicular to the slope, using drip irrigation, etc.), conserve water and produce a strong healthy plant.

- Popova Kula has begun to develop a record-keeping system on Macedonian pesticide regulations, a training record, a pesticide checklist with types and use rates, GAPs/IPM measures tried, PPE on hand, maintained and used, pest monitoring reports, environmental conditions and any incidences of resistance development, poisonings of people, fish, birds, honeybees, livestock, and water pollution, which is also a requirement for GlobalGAP certification and agriculture best management practices. This record-keeping should be taught to farmers who supply Popova Kula with grapes.

Specialized training plan which will accomplish many of the above recommendations

Popova Kula Winery
Value Chain - Wine Grapes

Phase 1: Training Needs Assessment (completed)

The needs assessment was conducted using:

Consultation with the lead agronomist,

Field inspection of the wine processing facility and surrounding vineyards,

Discussion with company staff,

Field assessment of buying centers for agricultural chemicals (pesticide pharmacies).

Phase 2: Interactive farmer training (to be done ASAP)

Component 1: Timing, ½ day (3-4 hours)

Component 2: Materials and infrastructure

Venue: Popova Kula Winery,

Instructor: Company Agronomist Demir Kapija

Printed materials: Printed take home materials for participants

Presentation materials: laptop computer, digital presentation, projector, examples of protective equipment, examples of pesticide application equipment

Condiments: Food and drinks for the participants

Component 3: Themes and content examined through interactive seminar

Introduction and knowledge base: groups of pesticides according to use; classification of pesticides based on safety and environment; most relevant local pest species; explanation of all components of pesticide labels; GlobalGAP standards related to pesticides.

Safety and handling issues: dose is related to toxicity; international examples of poisonings; acute vs. chronic poisoning; personal, family and environmental consequences of poor pesticide use; proper use and maintenance of application equipment; monitoring for resistance; use and maintenance of safety equipment; proper mixing of chemicals; disposal of packaging and unused chemicals.

Phase 3: International Integrated Pest Management Tools & Techniques (within 6 months)

Through consultation and assistance from AgBiz, the lead agronomist from Popova Kula Wineries will learn innovative IPM tools and techniques being used in top vineyards in USA and Europe. AgBiz may bring an international consultant to present examples of these IPM methods for the Popova Kula agronomist to test in field trials in the coming field season. The agronomist would be responsible for implementing testing these methods. The agronomist will be responsible for extending knowledge of effective IPM methods to farms where Popova Kula sources grapes.