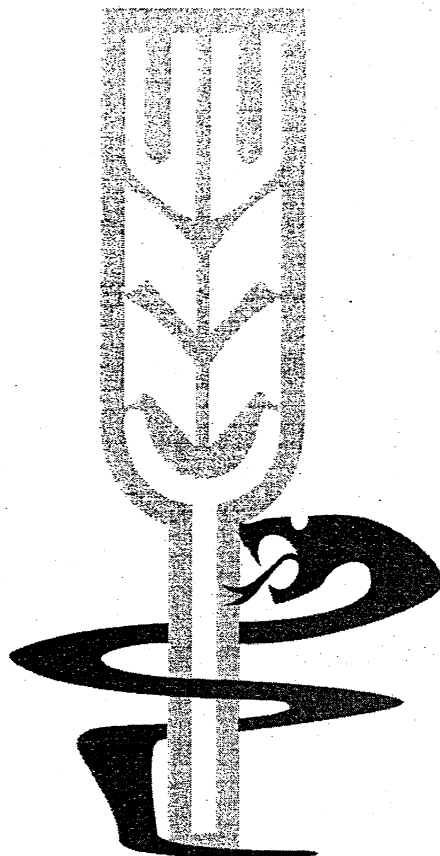


70th Anniversary of Plant Protection Institute
and Annual Balkan Week of Plant Health

BOOK OF ABSTRACTS



Agrochemical Management in Production of Tobacco

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Oral presentation

Environment protection requires from tobacco growers to secure a good quality and economically justified tobacco production. With respect to this, application of agrochemicals plays a particularly important role.

The agrochemicals should be applied in the lowest possible rate, in compliance with the Integral Protection Management (IPM), paying great attention to the use of adequate working clothes and equipment during their use.

Agrochemical management is focused on the importance of legislature, security and responsibility for environment protection from the use of various chemicals, with special reference to the method of their application, storage, deposition, precaution measures, operation in risky situations and, finally, to the increase of humans consciousness about their long-term effects and consequences.

Such management presumes skilled farmers who, by application of minimum rates of chemicals, will increase their yields, and will still not produce harmful effects to the environment.

The aim of the study was to emphasize the role of agrochemical management, with presentation of good practical principles.

Key words: agrochemicals management, environment, application, storage, deposition, precautions.

Use of Recombinant HaSNPV as Potential Biological Control in the Field

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Oral presentation

Baculoviruses are useful and effective biological control agents against insect pests. Naturally existing wild type viruses have some drawbacks, as they are relatively slow killers and not enough efficacious in controlling insects. The availability of new genetic technologies makes it possible to generate viruses with improved insecticidal characteristics. The recombinant HaSNPV-LM2, for example, a derivative of the *Helicoverpa armigera* single-nucleocapsid nucleopolyhedrovirus, has an enhanced speed of action and is marked by the absence of the ecdysteroid UDP-glycosyl transferase (egt) gene and the presence of the insect scorpion toxin gene (Aa/T). Previous field trials have shown that such recombinants are much more efficacious in the control of the cotton bollworm *H. armigera*. However, a key parameter to determine is the horizontal and vertical transmission rate of such recombinants versus wild type viruses. Therefore, a field trial was carried out in cotton in China to estimate the transmission rate of wild type HaSNPV and recombinant HaSNPV-LM2 in the *H. armigera* population. The transmission rate was found to be higher for wild type HaSNPV, at 5 and 7 days post infection compared with the recombinant virus. This finding contributes to the understanding of the long-term population dynamics of this particular insect pathogen system, but also has a major implication for evaluating the long-term biosafety of the release of recombinant baculoviruses in the field in general.

Key words: *Helicoverpa armigera*, HaSNPV, biological control, transmission

AGROCHEMICAL MANAGEMENT IN PRODUCTION OF TOBACCO

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Environment protection requires from tobacco growers to secure a good quality and economically justified tobacco production. With respect to this, application of agrochemicals plays a particularly important role.

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Such management presumes skilled farmers who, by application of minimum rates of chemicals, will increase their yields, without any harmful effects to the environment.

The aim of the study was to emphasize the role of agrochemical management, with presentation of good practical principles.

Key words: agrochemicals management, environment, application, storage, deposition, precautions.

INTRODUCTION

Agrochemical management is a very important factor in production of agricultural crops.

It is aimed toward adequate use of agrochemicals, keeping up strictly with law regulations, safety and responsibility with regard to the environment, the way of application, storage, precaution measures, operations in dangerous situations and increased awareness on their long-term effects and consequences. For this reason, attention has been focused on education of farmers in adequate management with agrochemicals and in the use of various methods that will secure minimum use of chemicals (Лазаревска, 2004. Мицески и сор. 2002. www.fao.org. 2005.)

Chemicals management comprises a range of activities with a final aim to achieve good yields and high quality of the crops through efficient and effective use of chemicals, paying equal attention to the environment protection.

MANAGEMENT ACTIVITIES BASED ON GOOD PRACTICE PROCEDURES IN APPLICATION OF CHEMICALS

Farmers should pay a good attention when they apply chemicals in the control of various diseases and pests because any inadequate use of this products will have a harmful effect not only on tobacco growth but also on the environment. Thus, for example, the

rainfalls rinse both plants and soils around them and such water, polluted with toxic chemicals, goes partly into the soil and partly in the rivers, lakes and seas. Thereby, water flora and fauna are easily destroyed and the soils and waters are polluted.

The basic management activities and training programs for education of farmers in the production of healthy agricultural crops with a good quality and high yields should go in direction of careful and safe application of chemicals, with particular attention being paid to animals and plants in the ambient where farmers live and wider in their environment.

The concept of adequate management activities and good practice procedures includes: application, selection, storage and disposal of chemicals.

MANAGEMENT IN THE USE OF AGROCHEMICALS

Management in the use of agrochemicals comprises a wide range of activities, with special reference to the following:

- the agrochemicals use only when absolutely necessary and according to integrated pest management;
- application only of those agrochemicals that are specifically labeled for tobacco;
- all aspects of label instructions for the use of agrochemicals should be considered carefully;
- the use of personal protective equipment (PPE) for handling, mixing and application of agrochemicals;
- safe application methods to safeguard people, wildlife, and the environment;
- the importance of harvest interval and re-entry times after application;
- the effect that agrochemical residues have on the usability of the crop;
- the correct storage of agrochemicals;
- correct disposal of waste containers and residual spray solution;
- relevant legislation, hazards and risks posed by agrochemicals, safe working practices, emergency and accident action plans, health surveillance and record keeping;
- prohibition of eating, drinking and smoking while handling, mixing or applying agrochemicals;
- prohibition of mixing and applying agrochemicals near open water courses.

KEY MANAGEMENT PRINCIPLES AND PRACTICAL PROCEDURES IN APPLICATION OF AGROCHEMICALS

Management with agrochemicals is a complex of activities performed for effective protection of crops (tobacco) from diseases, weeds and pests, taking care to avoid environment pollution. Realization of these activities requires possession of special skills and professional engagement. Therefore, the head manager and the staff engaged in crop protection must have a good knowledge in the use of chemicals and the way of their application.

Some of the key principals and practices in the use of agrochemicals are:

- adhere to all legal requirements when using agrochemicals;
- select only formulations that have a label for use on tobacco;
- follow application methods, post entry, and pre harvest intervals as stated on the product label;
- adequate training before handling or applying any agrochemical;

- adequate measures of security and proper behaviour during crop protection;
- safe conditions for the workers in performing the measures of protection;
- special care for the environment protection;
- apply pest control agents only when crop monitoring indicates that the economic threshold level has been reached;
- minimize agrochemical use in terms of volume and range through targeted application and spot treatments;
- adopt developments that reduce the pesticide volume;
- minimize and, if possible, avoid any negative impact on the environment;
- supply agrochemicals from approved sources, preferably branded products from the original manufacturers;
- wear protective clothing as suggested on product label when handling, mixing and applying agrochemicals;
- check the effectiveness of performed protection;

MANAGEMENT IN THE SELECTION OF AGROCHEMICALS

Selection of agrochemicals should be performed with particular attention. The choice should be made with respect of the intention, way and place of application.

In the selection of agrochemicals, it is important to:

- select an approved product with minimum toxicity and persistence and as safe as possible to humans, wildlife and the environment;
- make monitoring while providing effective control of the pest, disease or weed problem;
- make selection of a product that suits the situation and is not harmful to natural predators of the pests and trap crops;
- apply specific forms of action, required for each agrochemical.

MANAGEMENT IN STORAGE OF AGROCHEMICALS

The way of storage of agrochemicals is an important factor not only for preserving their properties but also for safety of humans, animals, plants and environment in general. Therefore, the users of agrochemicals should have in mind the following:

- all individuals involved with the handling, storage and use of agricultural chemicals, issue appropriate personnel protective equipment;
- store agricultural chemicals in facilities which are designed and designated for the purpose, and well away from wrapping materials and leaf;
- store all agrochemicals as recommended on the Material Safety Data Sheets (MSDS) to ensure that the physical conditions of the store are appropriate. Concerns to be examined include: flash points, maximum safe storage temperature, humidity restrictions (caking of granules, corrosion of containers);
- identify all products designated as flammable or reactive. isolate these agrochemicals from others and clearly identify all hazards, including specific measures to be taken in the event of a fire either within the store or externally;
- be sure that all storages are out of reach of unauthorized people, especially children, and also protected from straying farm animals and wildlife. Clearly display appropriate warning and danger signs to prevent accidents;

- ensure that the construction and maintenance of the storage structure and its contents will prevent contamination of water sources from the contents;
- ensure that there is a means for containing spilled or washed-down material within the storage - e.g. a gully - and a stock of absorbent material held for treatment of spills. floors should slope away from the entrances;
- store agricultural chemicals in original containers with the original manufacturers labels. any partially used containers must be closed firmly;
- keep all agrochemicals well away from any fire hazard or flammable materials;
- make available an emergency action plan to deal with unforeseen circumstances such as accidental spills, fires, flooding;
- keep records of stocks, MSDS and specimen labels outside the store and ensure that they are available to the emergency services;
- keep to a minimum the amount of agrochemicals in stores by only purchasing what is required.

MANAGEMENT IN THE HANDLING AND DISPOSAL OF AGROCHEMICALS

Appropriate disposal of agrochemicals is an important factor which consists of several aspects, including the following:

- the correct disposal of unwanted concentrated products and empty containers is an essential part of safeguarding human safety and the environment;
- when purchasing large volumes of chemicals, the contract should include the right to return to the supplier unused stocks within an agreed period;
- in the disposal of old stocks, the containers should be in sound condition prior to dispatch for disposal;
- all empty containers must be rinsed at least three times before disposal and rendered non-reusable (e.g. punctured);
- any possibility of empty containers being used for other purposes should be avoided;
- agrochemical rinse water should be added to the original spray solution and applied to the crop;
- it should be determined whether the supplier or manufacturer has a recycling scheme for empty containers. general recycling schemes should not be used for pesticide containers without clearance from the scheme's custodians;
- empty containers must be disposed of in accordance with local legislation;
- unwanted concentrated synthetic agrochemicals should not be disposed of by burning, burying, pouring into storm drains, sewer systems or any kind of water course.

CONCLUSION

Management with agrochemicals is a complex of activities performed to find an effective way for protection of crops (tobacco) from diseases, pests and weeds, taking in the same time care to preserve a healthy environment and to avoid pollution. Realization of these activities requires possession of special skills and professional engagement. Therefore, the head manager and the staff engaged in crop protection must have a good knowledge in the application and handling of agrochemicals.

Major management principles and practical procedures for use of agrochemicals include: working in accordance with all requirements necessary for application of agrochemicals, careful handling, following the methods recommended for their use, appropriate safety and security while handling, protection and security of workers and individuals involved in the process of application and special care to protect the environment.

Management with agrochemicals also pays particular attention to suitable distribution and disposal of used agrochemicals.

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