

Instead or that, EFSA was asked again for a revised risk assessment which was provided recently). EFSA collected more detailed cereal consumption data and re-calculated processing factors for cereal based products. Still supported uses are barley, millet, oats, sorghum and wheat. With all the new data available, it is now two UK diets (infants and toddlers) which exceed the ADI value. According to all other diets the risk for consumers is now acceptable. Main contributors to the UK diets are wheat bran and wholemeal bread. Concerning wheat bran, it is currently not clear from the data and has to be confirmed by UK, if bran is consumed as such or in the form of bran-based breakfast cereals. In the latter case, a different processing factor would apply and the risk would also be acceptable.

EFSA proposes to maintain the MRL of 5 mg/kg for pirimiphos-methyl in barley, millet, oats and sorghum. If the bran intake in UK turns out to be acceptable, the MRL of 5 mg/kg will also be proposed for wheat. If not, EFSA proposes to lower the wheat MRL to the LOQ.

Literature

http://www.efsa.europa.eu/EFSA/General/calculation_acutechronic_rev2.xls?ssbinary=true

lex.europa.eu/LexUriServ/site/en/oj/2007/l_145/l_14520070607en00160017.pdf

http://www.efsa.europa.eu/EFSA/PRAPER_Conclusion/praper_concl_sr77_dichlorvos_en1.pdf?ssbinary=true

http://www.efsa.europa.eu/EFSA/Scientific_Document/praper_ro_sr294_pirimiphos-methyl_en.pdf?ssbinary=true

13 - Grain and seed storage in France: State of practice and perspectives

Mathie, Maud

ARVALIS - Institut du végétal, Station Expérimentale
91 720 Boigneville, France

Abstract

ARVALIS – Institut du végétal is a French research and development institute working for farmers on different topics: in the field as well as after harvest with storage and quality preservation of grain. This work is carried out with various partners: public and private research institutes and professional organisations. In France, storage of cereals between harvest and use takes place in elevators and on farms. A survey carried out by the French National Office for Cereal (ONIGC/France Agrimer) showed that elevators use various ways to fight against insects, for example with preventive or remedial use of insecticides.

In this frame and given the current regulatory reduction of chemical products on the market, ARVALIS– Institut du végétal recommends the application of preventive practices through vocational scientific and practical training, articles in specialized papers, and meetings. The approach is first to store clean grain free from insects in cleaned premises. Additionally, the most important parameters to control and manage quality of stored products during storage are grain humidity and temperature. Thanks to this procedure, insects might not infest grain. But in case of insect development in the grain, elevator workers can use one of the three authorized liquid insecticides or control treatment. At the same time, ARVALIS is involved in research. The topics are close to the current preoccupations of elevator operators: sampling (how to get a representative sample of grain for insects search), early detection of insects in stored grain, use of aeration to cool grain temperature to avoid attracting insects to the grain and use of physical processes to kill insects (heat...).

Introduction

ARVALIS is a French institute involved in applied agricultural research. This paper introduces some of ARVALIS activities in the field of grain storage and preservation, and gives some pointers into the understanding of grain storage in France.

ARVALIS – Institut du végétal is an agricultural research and development institute composed of 400 people working in close relation to the food and cereal channel operators.

Principal topics range from the production of different cereal species to the different qualities of cereals required by users. In the field, there are trials of seed assessments, better crop management practice, cropping practices.

ARVALIS works on cereals, maize, pulses, potatoes and forage crops. After harvest, the institute is involved in research on the reception and evaluation of grain quality, grain cleaning and cooling ventilation during storage.

ARVALIS board of directors includes food and cereal channel operators, cultivators also participate in the financial support of the institute.

This is why ARVALIS is so close to the cultivator's direct preoccupations, to improve competitiveness whilst preserving the environment.

The current challenge is to help farmers to adapt their procedures to market and regulation changes, by providing research results, informing, training and advising them in their activities.

Our activities are usually undertaken in partnerships with other institutions, either private or public. Basic research is carried out with the INRA (National Institute of Agronomic Research).

ARVALIS also works with local advisors. They help ARVALIS understand the local demand (in terms of training for example) which is taken into consideration with 19 ARVALIS stations are located throughout France.

France produces approximately 60 million tonnes of cereals each year, cultivated on 9 million hectares.

Almost half of the grain cultivators (47%) store it at on farm, wholly or partially, as feed or to sell on the market, directly or through grain merchants. The grain storage is akin to a chain in which cultivators are the first link. They can sell the grain immediately after harvest or store it on farm in order to sell it later, depending on market prices.

The second link of this chain is composed of around 850 grain merchants.

Grain is stored in cooperative structures or on private grain merchant premises.

Further links could be harbour storage silos, grain merchants or grain processors (millers etc.).

In the current legislative framework, with the recent withdrawal of active substances such as dichlorvos and malathion, all these links have to work together and communicate on their practices.

The relationship between cultivators and grain merchants depend on the contract, the quality of the grain stored and the silo policy. For example, some silo operators visit cultivators to inspect their premises during storage. Some farmers may treat the grain as a curative or a preventive method to guard against insects, all treatments should be noted and indicated to the grain merchant.

Given these elements, the MRL of some active substances could be exceeded and a building up of different storage insecticides could occur.

Traceability of all pesticide usage and more widely all storage techniques used is part of good storage practice.

The message delivered by ARVALIS is clear: store clean grain in clean facilities, regulate humidity and temperature. But it is not as easy to put these credos into application: only 40% of French wheat is cleaned at reception at the silo. There is also a lack of sufficient equipment to cool stored grain, and sometimes a lack of knowledge on silo management.

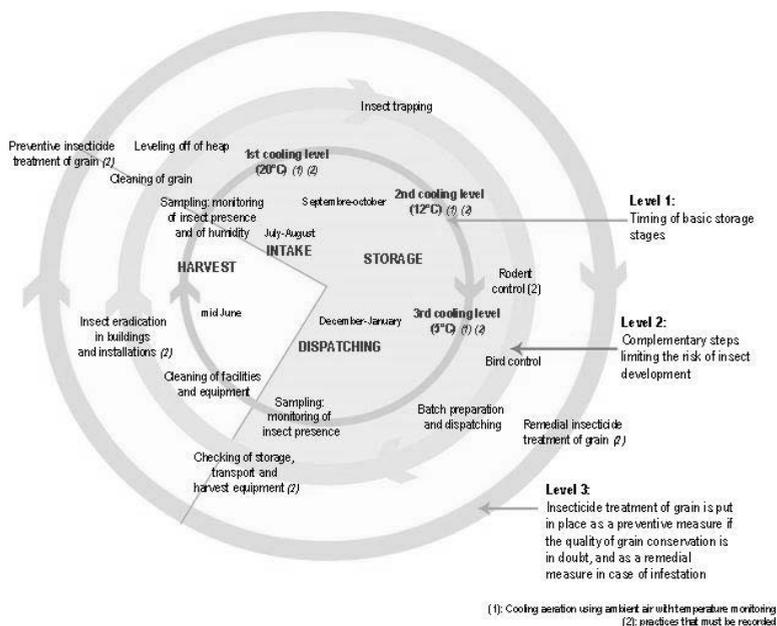


Fig. 1 Good practices to prevent insect development and guarantee grain sanitary quality

There are 3 levels on this chart, each level overlaps onto the others.

Level 1 is composed of the basic storage steps:

- Cleaning facilities and equipment are necessary to ensure a dust free environment.
- When premises are empty, they should be cleaned using brushes and vacuum cleaners.
- Sampling grain at reception makes it possible to detect insects and determine grain humidity. If the humidity of grain is higher than 16%, drying is recommended with aeration or in a grain dryer.
- During storage, the temperature should be lowered using cooling aeration. 3 steps are recommended:
 - 20°C immediately after harvest. This should help prevent attracting insects to the grain.
 - 12°C in autumn. If insects did penetrate the grain, at such temperatures they would stop feeding and reproducing.
 - 5°C in winter. If the grain temperature remained at 12°C for more than 3 weeks, insects would be killed in a few months at this temperature.
- Sampling grain before dispatch ensures the operator that there are no living insect in the grain.

Level 2 is composed of complementary steps to limit the risk of insect development:

- Maintaining harvest and storage equipment: more than just cleaning, all equipment must be cleaned and maintained in good working order.
- Flow rates must also be verified.
- Preventive insecticide treatment on cleaned material, equipment and premises ensures the absence of insects before loading silos with grain.
- Cleaning grain removes dust and straw, clean grain is less easily infested by insects.
- Levelling off the heap allows the cooling aeration to penetrate efficiently throughout the whole pile. When piles are not levelled, aeration is much less efficient, which can allow the necessary conditions for insect development.
- The use of mechanical insect traps during storage may show signs of insect infestation. Early detection makes it possible to undertake curative insecticide treatment.

Level 3 may be applied if there is any suspicion of substandard preservation or in case of a declared insect infestation. The following treatments should only be undertaken with authorized products:

- Preventive insecticide treatment may be used in case of suspicion of bad preservation, or in cases where it isn't possible to run cooling aeration.
- Remedial insecticide treatment of grain may be used in cases of a declared insect infestation in grain detected by using traps or sample review.

All these steps are part of ARVALIS' message. These levels are not fully implemented at every storage site in France, but some operators do already follow similar practices.

In this framework and given the current regulatory reduction of chemical products on the market, ARVALIS–Institut du végétal recommends the application of preventive practices through vocational scientific and practical training, articles in specialized papers, and meetings.

Our team is currently involved in research projects on the development of novel methods as well as the evaluation of new equipment for the detection and prevention of insect infestation.

Our topics remain close to the current concerns of grain merchants' operators : sampling (or how to obtain a representative sample of grain), early detection of insects in stored grain, the use of aeration to cool grain temperature to avoid attracting insects to the grain, grain cleaning and use of physical processes to kill insects.

In conclusion, the future of ARVALIS activities will be the stewardships of current and probably new grain preservation methods. Professional training is a good way to help operators improve their practices.

Arvalis is interested in building new research projects or even discussions with organizations of other countries on grain storage and preservation.

Literature

ARVALIS, 2009. Selected Papers n°8.

ARVALIS, 2003. Stockage et conservation des grains à la ferme.

ARVALIS, Coop de FRANCE, FNA 2008. Ventilation des grains. Guide pratique.