



## EUROPEAN COMMISSION

DIRECTORATE-GENERAL FOR AGRICULTURE AND RURAL DEVELOPMENT

Directorate F. Horizontal aspects of rural development

**F.5. Organic farming**

# **Report of the ad-hoc expert group on pesticides in organic food production**

## **Meeting on 22-23 January 2008**

Upon invitation by the European Commission, the following experts attended a meeting in Brussels on 22 – 23 January, 2008:

- Rolf Forster, Germany
- Cristina Micheloni, Italy
- Eric Regouin, The Netherlands
- Bernhard Speiser, Switzerland
- Elisa Viñuela, Spain

### **Agenda**

Elaboration of a recommendation to the Commission on the authorisation of the following substances:

1. Spinosad as an insecticide
2. Potassium bicarbonate as a fungicide
3. Copper octanoate used as a fungicide
4. Ethylene for ripening citrus fruits
5. Ethylene for sprout suppressing in onions and potatoes

This work follows from Council Regulation (EEC) No.2092/91, which sets out in its article 7, paragraph 4, that a Member State, when it considers that a product should be added to Annex II of the said regulation, it shall ensure that a dossier giving the reasons for the inclusion of the amendments is sent officially to the other Member States and the Commission, which shall introduce it to the committee referred to in Article 14.

In order to organise the discussion in a number of requests, the Commission is seeking the advice and recommendations of an ad-hoc expert group.

The recommendations shall be based on the objectives, principles and criteria for organic production as set out in Council Regulation (EC) No 834/2007<sup>1</sup> on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/97.

The recommendation shall before preferably be delivered by the end of this meeting, and shall, as appropriate for authorised substances contain restriction with respect to use, concentration, review or any other condition deemed adequate.

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<sup>1</sup> OJ L 189 of 20.7.2007

### Glossary with explanations

This section was added after the meeting. It explains some of the specialist terms used in this document. The explanations are given to facilitate the understanding of the document and cannot be considered as comprehensive definitions.

Active substance	Substance which has an effect on crop pests or diseases, or acts as a growth regulator. Active substances are regulated at EU level by Directive 91/414/EEC and must be listed in Annex I of this directive, before they can be used in plant protection products in the Member States (MS) of the EU.
Annex I	Annex I of Directive 91/414/EEC. List of all active substances which are allowed to be used in plant protection products in the MS of the EU.
DAR	Draft Assessment Report. Report on an active substance, prepared by a RMS after evaluation of the application dossier submitted by a notifier. The DAR is subject to peer review by all Member States and EFSA (European Food Safety Authority), before a final decision on the substance is taken.
Field rate	Quantity of a single application of a plant protection product applied in the field, not including application frequency.
Label rate	Quantity of a single application of a plant protection product, for which efficacy has been declared sufficient during the authorization procedure. This rate is recommended on the product label.
Plant protection product (PPP)	Preparations or formulations of active substances, intended to be used for the control of a particular pest or disease, or as a growth regulator. Plant protection products usually contain one or several active substances (responsible for the effect) and one or several formulating agents (spreaders, stickers, UV protectants etc.). PPP and their uses (including label rates, maximum number of applications per year and crop, pre-harvest intervals together with risk management practices) are authorized at Member State level.
RMS	Rapporteur Member State. Member State to which an application for an active substance is submitted and which prepares a DAR.
3 <sup>rd</sup> stage review / 4 <sup>th</sup> stage review	Review of active substances which had been authorized in a Member State of the EU before Directive 91/414/EEC was in force. This review takes place in four stages. Among many other substances, the 3 <sup>rd</sup> stage comprised all copper compounds and the 4 <sup>th</sup> stage comprises many of the substances currently used in organic farming or discussed in this document. At the time of this meeting, the 3 <sup>rd</sup> and 4 <sup>th</sup> stage were not completed, and decisions on inclusion/non-inclusion in Annex I were pending for some substances of the 3 <sup>rd</sup> stage and for all substances of the 4 <sup>th</sup> stage.

## Report

### **1. Request concerning the use of spinosad as an insecticide**

#### **1.1 Recommendations**

The expert group recommends spinosad to be allowed as an insecticide in organic farming.

If spinosad would be envisaged for inclusion in Reg. 2092/91/EEC, the group recommends that it should be accompanied by the conditions for use “need recognized by the inspection body or inspection authority” for reasons of consistency with other substances.

If spinosad would be envisaged for inclusion in Reg. 834/2007, the expert group is of the opinion that, in addition to the specific provisions from product registration on the product label,

- risks to key parasitoids should be minimized, and
- risks of development of resistance should be minimized.

Appropriate restrictions can best be developed at national or regional level.

#### **1.2 Considerations**

##### **Identification of substance**

No issue.

##### **Authorization in general agriculture**

###### *Authorization at Community level*

Spinosad is registered in Annex I of Dir. 91/414/EEC as insecticide.

###### *Authorizations at Member State level*

Products based on spinosad are authorized in many EU Member States for many uses (glasshouses and field crops; vegetables, fruit, olives, citrus, grapes, arable crops, ornamentals).

##### **Origin**

Spinosad is of microbial origin (from the bacterium *Saccharopolyspora spinosa*). The organism presently used is not a GMO. It is a selected strain (chemical mutant). The technique of chemical induction of mutants is also widespread in plant breeding. Whether or not the growth medium contains GMO is not relevant (Art. 2(v)).

##### **Necessity**

###### *Details of use*

Main targets are Lepidoptera (caterpillars), Thysanoptera (thrips) and Diptera (mainly fruit flies and stable flies).

Two basic spray formulations are currently used in different crops: formulations without baits can be used in many crops, while formulations containing baits can be used for fruit fly control (currently in citrus and olives).

A different formulation is used for the control of stable flies.

Spinosad is compatible with biological control (e.g. release of predators and parasitoids), provided that direct exposure is avoided.

### *Alternative products and methods currently allowed*

For many intended uses (crop-pest situations), there are no alternative products or viable methods available. Currently available alternatives: pyrethrum, rotenone, neem, *Bacillus thuringiensis*, granulosis viruses. Some of these may not be available in the future, e.g. rotenone will be withdrawn. Where there are alternative products, spinosad will contribute to decrease the risk of pest resistance to the few pesticides available.

Some of the available alternatives are less desirable than spinosad: for example, certain pyrethrum formulations, and rotenone show more undesired side-effects; pyrethroids in traps for control of some fruit flies are of synthetic origin.

### *Necessity of requested use*

Spinosad is essential for the control of some key pests (e.g. thrips in leek, fruit flies in citrus, olive fly).

For some other crop-pest situations, spinosad contributes to the sustainability of production systems that are particularly vulnerable to pests or diseases, as it is often more efficient than the available alternatives and it may contribute to resistance management. For example, in the control of codling moth, alternation of spinosad and granulosis virus decreases the risk of resistance development.

## **Environmental issues**

Environmental fate, hazards and risks are assessed in detail during pesticide registration, and authorizations are accompanied by obligations for appropriate risk management practices (e.g. buffer zones). The expert group does not see the need to reassess these issues.

### *Environmental fate of substance*

No concern during assessment in accordance with Dir. 91/414/EEC. For example rapid photodegradation, and also microbial breakdown. End-product CO<sub>2</sub>.

### *Environmental hazards and risk management*

Spinosad is hazardous to aquatic organisms and to some non-target insects (pollinators, beneficials):

- Aquatic organisms: spinosad is toxic for aquatic organisms. Authorization procedures already deal with this risk, requiring e.g. buffer zones or prohibiting air plane spraying.
- Non-target insects: spinosad is highly toxic for Hymenoptera (bees, bumble bees, parasitoid wasps, ants) and earwigs (dermaptera) when they are directly sprayed or exposed to fresh residues. Authorization procedures already deal with this risk, requiring e.g. buffer zones to protect terrestrial habitats or prohibiting spraying during flowering periods (to protect pollinators).

## **Human health**

Human health risks are assessed in detail during pesticide registration, and authorizations are accompanied by obligations for appropriate risk management practices (e.g. pre-harvest intervals). The expert group does not see the need to reassess these risks.

## **Objectives and principles of organic farming**

### *Food quality*

As long as registration requirements are fulfilled (e.g. maximum field rate, maximum number of applications, pre-harvest intervals), residues are no concern.

*Effects on animal welfare*

Control of stable flies is beneficial to animals in stables.

**Harmonization**

*Historic use in EU organic farming*

Spinosad is a new substance and has no historic use.

*Use in organic farming outside the EU*

Yes, e.g. USA, Switzerland.

*Precedents in EU organic farming*

No exactly matching precedents, the closest similar crop protection agent is *Bacillus thuringiensis* (B.t.). Preparations of B.t. contain spores together with a crystal toxin, while spinosad preparations contain only the substances spinosyn A and D, but not the micro-organism *Saccharopolyspora spinosa* which produces them.

**Further remarks**

The expert group recommends to clarify in the Regulation that micro-organisms are generally allowed, while specific microbial products are only allowed on a case-by-case basis and need to be listed individually.

## 2. Request concerning the use of potassium bicarbonate as a fungicide

### 2.1 Recommendations

The expert group recommends potassium bicarbonate to be allowed as a fungicide in organic farming and sees no need for further conditions.

### 2.2 Considerations

#### Identification of substance

No issue.

In the context of the 4<sup>th</sup> stage review, potassium bicarbonate is considered as the active substance. Infections only occur under moist conditions, under which potassium bicarbonate dissolves into its ions and only the bicarbonate ion is responsible for the fungicidal effect.

#### Authorization in general agriculture

##### *Authorization at Community level*

Under review during 4<sup>th</sup> stage. RMS Ireland proposes Annex I inclusion.

##### *Authorizations at Member State level*

Pending in several MS. Authorized as commodity in the UK.

#### Origin

Both potassium and bicarbonate are ubiquitous in nature. The commercial substance is manufactured from potassium chloride and carbon dioxide.

#### Necessity

##### *Details of use*

Effective against various diseases in a range of crops (some of which are high-value crops), e.g. scab in pome fruit, powdery mildew in various crops, grey mould. No systemic action.

##### *Alternative products and methods currently allowed*

For many intended uses (crop-pest situations), copper (not allowed by all MS), sulphur and a few other substances are available. Against grey mould in strawberries, there are no effective alternatives. Varietal resistance is often not sufficient, because fungi break resistance easily.

In general, substances which may complement copper and sulphur are highly desirable in organic farming.

##### *Necessity of requested use*

Potassium bicarbonate is a welcome management tool. Reduction of the use of currently available fungicides contributes to the sustainability of the production system.

#### Environmental issues

Environmental fate, hazards and risks are assessed in detail during pesticide registration, and authorizations are accompanied by obligations for appropriate risk management practices (e.g. buffer zones). The expert group does not see the need to reassess these issues.

##### *Environmental fate of substance*

No concern during 4<sup>th</sup> stage review.

*Environmental hazards and risk management*

No critical concerns identified.

**Human health**

No concerns identified in DAR.

**Objectives and principles of organic farming: Food quality**

Residues are no concern. Potassium bicarbonate is also a food additive (E 501) listed in Annex VI A of Regulation 2092/91.

**Harmonization**

*Use in organic farming outside the EU*

Yes, e.g. USA.

*Precedents in EU organic farming*

- Sodium bicarbonate (with the same active agent bicarbonate) was included in the original version of Regulation (EEC) No. 2092/91.
- Listed plant strengtheners based on sodium and potassium bicarbonate are used in Germany and Austria.

### 3. Request concerning the use of copper octanoate as a fungicide

#### 3.1 Recommendations

The expert group recommends copper octanoate to be allowed as a fungicide in organic farming for reasons of consistency with other copper compounds.

According to some field trials and currently registered label uses, copper octanoate may contribute to reduction of copper use.

The group recommends to apply the same conditions for use as for the other copper compounds.

#### 3.2 Considerations

##### Identification of substance

No issue.

In the context of the 3<sup>rd</sup> stage review, copper octanoate is considered as the active substance. Infections only occur under moist conditions, under which copper octanoate dissolves into its ions, and the copper ion is the primary active agent.

##### Authorization in general agriculture

###### *Authorization at Community level*

Copper octanoate is subject to the 3<sup>rd</sup> stage of re-evaluation (3A); RMS is France. Annex I status is pending.

The same is the case for other copper compounds, for which the RMS proposes inclusion in Annex I.

###### *Authorizations at Member State level*

Currently, two products based on copper octanoate are authorized in Germany.

##### Origin

Copper is of mineral origin and undergoes saponification with fatty acids. Saponification is also used in manufacture of soft soap.

##### Necessity

###### *Details of use*

In principle, copper octanoate could be used for the same purposes as the other copper compounds and has a similar effectivity. In addition, it has an effect against powdery mildew.

Label rates for copper octanoate (in terms of pure copper ion) are lower than for other copper compounds, both per application and over a season.

###### *Alternative products and methods currently allowed*

Alternative products to copper compounds (e.g. sulphur) and methods are not sufficiently effective.

###### *Necessity of requested use*

Inclusion of copper octanoate would be consistent with the current listing of the other copper compounds in Annex II B of 2092/91.



**Environmental issues**

Environmental fate, hazards and risks are assessed in detail during pesticide registration, and authorizations are accompanied by obligations for appropriate risk management practices (e.g. buffer zones). The expert group does not see the need to reassess these issues.

Environmental issues are the same as for other copper compounds: they are known to pose certain risks to the environment.

The total amount of copper applied per season is lower for copper octanoate than for other copper compounds, if both are used according to label rates.

**Human health**

Human health risks are assessed in detail during pesticide registration, and authorizations are accompanied by obligations for appropriate risk management practices (e.g. harvest intervals). The expert group does not see the need to reassess these risks.

**Objectives and principles of organic farming: Food quality**

The same as for other copper compounds.

**Harmonization***Historic use in EU organic farming*

Copper compounds have been traditionally used in organic farming. The octanoate form is new and has no historic use.

*Use in organic farming outside the EU*

Yes, USA. Copper octanoate is listed by OMRI (Organic Materials Review Institute).

*Precedents in EU organic farming*

Other copper compounds. These are inorganic salts, while copper octanoate is a salt of a natural fatty acid.

## 4. Request concerning the use of ethylene for degreening citrus fruit

### 4.1 Recommendations

The expert group recommends ethylene to be allowed for degreening of citrus fruit. However, it should be limited to situations where degreening is part of a strategy for the prevention of fruit fly damage in citrus.

### 4.2 Considerations

#### Identification of substance

No issue.

#### Authorization in general agriculture

##### *Authorization at Community level*

Ethylene for post-harvest treatment is subject to the 4<sup>th</sup> stage review. Annex I status is pending. RMS UK proposes Annex I inclusion.

##### *Authorizations at Member State level*

Has been considered a commodity, now registered for post-harvest treatment in various MS.

#### Origin

Ethylene is produced by all higher plants and therefore omnipresent in nature. The ethylene (identical to the naturally occurring ethylene) used for agricultural purposes is obtained through chemical processes (see further remarks below).

#### Necessity

##### *Details of use*

By harvesting citrus when they are green, fruit fly infestation can be avoided. This practice necessitates the induction of colour change of the peel in the post-harvest stage. This can be achieved by post-harvest exposure to ethylene in closed chambers for 2 days.

The use of ethylene for degreening is a traditional practice in lemons. However, its use as part of a strategy for fruit fly prevention has been newly developed for organic citrus.

##### *Alternative products and methods currently allowed*

Bait spraying of spinosad would be an alternative, but is not currently allowed for organic farming. Pyrethrum, rotenone and pyrethroids (in traps) are alternatives with partial efficacy.

##### *Necessity of requested use*

Could contribute to solve problems with fruit flies and to avoid pesticide use in the field.

Any use for purposes other than in the context of fruit fly control is not considered essential by the expert group.

#### Environmental issues

Environmental fate, hazards and risks are assessed in detail during pesticide registration, and authorizations are accompanied by obligations for appropriate risk management. The expert group does not see the need to reassess these issues.

The DAR on ethylene does not raise any concerns.

Theoretically, after release from the storage rooms, ethylene could affect the vegetation, but

the quantities used are negligible in comparison to natural and industrial emissions.

### **Human health**

No concern.

### **Objectives and principles of organic farming**

#### *Prevention of damage*

The maintenance of plant health by preventative measures is one of the principles of organic farming (Art. 5(f)).

#### *Food quality*

No adverse effect on intrinsic food quality (internal ripening of citrus is completed before harvest). Effect on peel colour only, which facilitates marketing.

### **Harmonization**

#### *Historic use in EU organic farming*

Yes, but not in citrus.

#### *Use in organic farming outside the EU*

Not known to the expert group.

#### *Precedents in EU organic farming*

Degreening of banana, khaki and kiwi.

### **Further remarks**

This application should be seen in the context of crop protection.

According to Reg. 2173/2003, degreening of citrus is permitted only if the other natural organoleptic characteristics are not modified.

The expert group has only considered the use of ethylene on citrus (a non-climacteric fruit), where it has no influence on physiological ripening (taste, flavour, texture). The use on climacteric fruit (e.g. apples, tomatoes, kiwi, khaki), where ethylene does affect physiological ripening, was not discussed.

Ethylene can be applied in several ways. In airtight, closed chambers injection of compressed ethylene gas is proposed in the request for degreening citrus, while heating of ethanol on a catalyst is proposed in the request for sprouting inhibition in potatoes and onions.

There are ethylene field application methods which are not allowed in organic farming (calcium carbide, ethephon). The expert group recommends to clarify in the Regulation which ways of ethylene application are allowed.

## **5. Request concerning the use of ethylene for sprouting inhibition in potatoes and onions**

### **5.1 Recommendations**

The expert group recommends ethylene to be allowed for sprouting inhibition in potatoes and onions.

### **5.2 Considerations**

#### **Identification of substance**

No issue.

#### **Authorization in general agriculture**

##### *Authorization at Community level*

Ethylene for post-harvest treatment is subject to the 4<sup>th</sup> stage review. Annex I status is pending. RMS UK proposes Annex I inclusion.

##### *Authorizations at Member State level*

Has been considered a commodity, now registered for post-harvest treatment in various MS.

#### **Origin**

Ethylene is produced by all higher plants and therefore omnipresent in nature. The ethylene (identical to the naturally occurring ethylene) used for agricultural purposes is obtained through chemical processes (see further remarks below).

#### **Necessity**

##### *Details of use*

Constant exposure of stored potatoes and onions to ethylene in low concentration inhibits sprouting.

##### *Alternative products and methods currently allowed*

Cold storage, use of varieties with high dormancy and/or caraway seed oil (for potatoes, where registered) may provide solutions in certain situations.

##### *Necessity of requested use*

A longer marketing period is important for the economic sustainability of farms.

This use of ethylene is not directly linked to the control of a pest or disease, but under Dir 91/414, this use of ethylene is considered to be plant protection. In Reg. 2092/91, products for similar uses (including sprout inhibition with caraway oil) are listed together with pesticides in Annex II B. Therefore, it is the opinion of the expert group that the criteria in Reg. 834/2007, Art. 16 are applicable in this case.

#### **Environmental issues**

Environmental fate, hazards and risks are assessed in detail during pesticide registration, and authorizations are accompanied by obligations for appropriate risk management. The expert group does not see the need to reassess these issues.

The DAR on ethylene does not raise any concerns.

Theoretically, after release from the storage rooms, ethylene could affect the vegetation, but

the quantities used are negligible in comparison to natural and industrial emissions.

### **Human health**

No concern.

### **Objectives and principles of organic farming: Food quality**

Under conditions of prolonged storage, a higher external and internal quality can be maintained (absence of sprouts and wrinkles, composition of tubers).

If it allows storage of potatoes at higher temperatures, it would contribute to reducing the risk of formation of acrylamide during processing, frying or baking of the potatoes.

### **Harmonization**

#### *Historic use in EU organic farming*

Yes, but not in potatoes and onions.

#### *Use in organic farming outside the EU*

Not known to the expert group.

#### *Precedents in EU organic farming*

- Ethylene: Degreening of banana, khaki and kiwi, but no use for sprout inhibition.
- Sprout inhibition: caraway oil (listed in Annex II B under the generic term of “plant oils”)

### **Further remarks**

This use can allow to store potatoes and onions for a longer period and, as a consequence, to supply the market with locally produced potatoes and onions for a longer period.

Ethylene can be applied in several ways. In airtight, closed chambers injection of compressed ethylene gas is proposed in the request for degreening citrus, while heating of ethanol on a catalyst is proposed in the request for sprouting inhibition in potatoes and onions.

There are ethylene field application methods which are not allowed in organic farming (calcium carbide, ethephon). The expert group recommends to clarify in the Regulation which ways of ethylene application are allowed.