

Reducing the use of copper in potatoes

Problem

Copper is still the most effective permitted means of protection for plants against leaf blight in organic potato production. However, this heavy metal has the great disadvantage of accumulating in the soil and damaging soil organisms in the case of higher input. The annual maximum quantity of pure copper as specified by EU organic regulations is set at 6 kg per ha. For members of national organic associations lower maximum quantities may apply.

Solution

In order to minimise the negative effects of copper on the environment, and to avoid exceeding the current maximum quantities per hectare and year, the dosage of copper and the intensity of treatment can be adapted to specific levels of infection, as well as weather conditions.

Applicability box

Theme

Pest and disease control

Geographical coverage

Potato cultivation areas in temperate zones

Application time

From first leaf development to final yield formation (in Europe: June to July)

Required time

3-8 sprayings

Period of impact

Current crop

Equipment

Row-crop sprayer

Best in

Potatoes

Outcome

- Lower accumulation of copper in the soil.
- Less damage to microorganisms in the soil.
- Potential saving in costs of spraying agent.
- Improved distribution of spraying agent over the required period of treatment until exhaustion of the permitted maximum quantity.

Practical recommendation

Adapting dosage to state of infestation: As long as there is no infestation in a radius of 50 km, refrain from treating. Observe national information and alert services. As soon as the first case of infestation in the region is reported, protect potatoes with 200 to 250 g of pure copper per hectare. If potatoes in your own or neighbouring fields are afflicted by leaf blight, increase the dosage to 800 g and do not wait longer than a week in between treatments (Figure 1).

| | | | | |
|----------------------------|--|----------------------------------|---|--|
| | | | | |
| Infestation status | No infestation in the region (radius 50 km) | Infestation in the region | Infestation in neighbouring fields or your own field | |
| Risk of leaf blight | low | moderate | high | |
| Copper dosage | none | low 200-250 g | high 800 g | |

Figure 1: Recommended three-step strategy for the use of copper

Adapting dosage to time of infestation: If yield production is already advanced at time of infection (often after mid/end of June), reduce the copper dosage or forgo its use. Carry out a sample digging to evaluate yield production.

Adapting treatment to the weather: Apply the copper shortly before periods of bad weather to ensure protection during an occurrence of rain for as long as possible. Repeat the treatment once the plants are dry again.

Tips

- Due to the purely protective effect of copper, a regularly applied film on the upper and lower surface of the leaves is crucial for an effective protection of the potato plants. New application techniques (e.g. upper- and lower-leaf sprayer) help in achieving a regularly applied copper film.
- New copper compounds give a better distribution on the leaf surface, as well as an increased rain-resistance, which enables lower dosages.

Practical testing

If this method seems to be suitable for your farm, we recommend that you test it under your own farm conditions as follows:

1. Delimit part of a potato field for testing (e.g. one breadth of a crop-sprayer row) which you choose to treat following the recommended method. Mark the limits to the remaining field at both ends of the field.
2. Apply the recommended method within the chosen plot of land. Treat the remaining land as usual.

Evaluation and sharing of results

Visual evaluation: In order to evaluate the method's effectiveness, estimate and compare the state of infestation of the potatoes in both plots at simple sight. With the help of photographs, you can document the result and consult it later on for analysis.

Quantitative evaluation: For a quantitative assessment compare the weight of the marketable potatoes from the testing plot with that of the potatoes that were treated according to the farm's standard. In addition, the copper application rate for the entire potato crop can be calculated and the date of first infection recorded.

Use the comment section on the [Farmknowledge platform](#) to share your experiences with other farmers, advisors and scientists! If you have any questions concerning the method, please contact the author of the practice abstract by e-mail.



Further information

Links

- The [Farmknowledge tool database](#) offers practical follow-up information on leaf-blight control in organic potatoes.
- Technical guide [Organic Potatoes by FiBL/ORC](#) (English edition available in spring 2017).

About this practice abstract and OK-Net Arable

Publishers:

Research Institute of Organic Agriculture (FiBL), Switzerland
Ackerstrasse 113, Postfach 219, CH-5070 Frick
Tel. +41 62 865 72 72, info.suisse@fbl.org, www.fbl.org

IFOAM EU, Rue du Commerce 124, BE-1000 Brussels
Tel. +32 2 280 12 23, info@ifoam-eu.org, www.ifoam-eu.org

Authors: Hansueli Dierauer, Franziska Siegrist and Gilles Weidmann (FiBL)

Contact: hansueli.dierauer@fbl.org

Translation: Andreas Basler

Language editing: Simon Moakes

Permalink: [Orgprints.org/31028](http://orgprints.org/31028)

OK-Net Arable: This practice abstract was elaborated in the Organic Knowledge Network Arable project. The project is running from March 2015 to February 2018. OK-Net Arable promotes exchange of knowledge

among farmers, farm advisers and scientists with the aim to increase productivity and quality in organic arable cropping all over Europe.

Project website: www.ok-net-arable.eu

Project partners: IFOAM EU Group (project coordinator), BE; Organic Research Centre, UK; Bioland Beratung GmbH, DE; Aarhus University (ICROFS), DK; Associazione Italiana, per l'Agricoltura Biologica (AIAB), IT; European Forum for Agricultural and Rural Advisory Services (EUFRAS); Centro Internazionale di Alti Studi Agronomici Mediterranei - Istituto Agronomico Mediterraneo Di Bari (IAM), IT; FiBL Projekte GmbH, DE; FiBL Österreich, AT; FiBL Schweiz, CH; Ökológiai Mezőgazdasági Kutatóintézet (ÖMKI), HU; Con Marche Bio, IT; Estonian Organic Farming Foundation, EE; BioForum Vlaanderen, BE; Institut Technique de l'Agriculture Biologique, FR; SEGES, DK : Bioselena, Bulgaria

© 2017

