Research Institute of Organic Agriculture (FiBL), Ackerstrasse, CH-5070 Frick, Phone: +41(0)62 865 72 47, Fax: +41(0)62 865 72 73, www.fibl.org e-mail: andi.schmid@fibl.ch



## Reduced copper treatments in strawberries by cultural methods

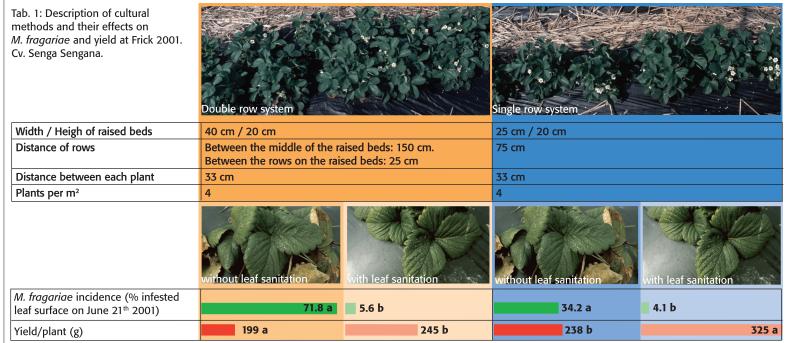
Effect of cultural methods on leaf spot (Mycosphaerella fragariae Tul.) and yield in strawberries

# There is A problem ...

Leaf spot caused by Mycosphaerella fragariae Tul. is one of the most common diseases of strawberry. The control of leaf spot mostly relies on the application of protective fungicides (MAAS 1998). In organic agriculture the use of copper products is effective (VUKOVITS 1980) but this has a negative influence on soil fertility (BERGMANN 1993). Therefore its use in strawberry crops should be reduced.

The field study evaluated the effects of cultural methods on leaf spot incidence and yield. Influence of planting density and removal of dead and leaf spot infested leaves in March before sprouting were the investigation criteria. The potted green plants cv. Senga Sengana were planted in August 2000 on raised beds. The planting systems are described in Table 1 below.

### ut there is also a solution ...



Means within each field followed by different letter are significantly different (P = 0.05, Tukey Test)

In the single row system M. fragariae incidence (treatments without leaf sanitation) were lower and yields were higher than in the double row system. In both systems leaf sanitation decreased M. fragariae significantly and yield was increased (Table 1).

## ... which enables to reduce the opper input in organic strawberry crops.

In this trial, it was possible to achieve an acceptable low leaf spot incidence without any copper treatments (Figure 1). It can therefore be suggested for Central European conditions to apply a single row system combined with leaf sanitation. Leaf sanitation should be done carefully, healthy green leaves should remain intact, otherwise fruit weight could decrease significantly (data not shown). The best period to conduct the leaf sanitation is during a frost period in early

spring before plants begin to sprout. Removal of dead leaves can be done by besom, but removal of green leaves infested by M. fragariae should be done by hand. The time required for leaf sanitation is about 40-100 hours per ha-1 which corresponds to 2-5 % of the amount of working time in strawberry. It is conceivable to do this work in future with a crop adapted machine with brushes, similar to the one used for cleaning streets.



Fig. 1: Examples of M. fragaeriae incidence on after harvest in treatments without leaf sanitation (left) and with leaf sanitation (right). Cv. Senga Sengana

### Acknowledgement

We thank Franco Weibel, Thomas Alföldi and Raniana Khanna for critical reading of the manuscript. This research was supported by the Swiss Federal Office for Agriculture (BLW).

Bergmann, W. 1993. Kupferüberschuss: Ernährungsstörungen bei Kulturpflanzen. 3. Gustav Fischer Verlag Jena, Stuttgart, Germany. 246-249.

Maas, J. L. 1998 Leaf spot: Compendium of strawberry diseases. The American Phytopathological Society St. Paul, Minnesota, USA. 21–24.

Vukovits, G. 1980. Weissfleckenkrankheit der Erdbeere: Obstkrankheiten – Erkennen, Ursachen und Bekämpfung, Beerenobst (4). Leopold Stocker Verlag, Graz (Austria). 89–93.