



## Assessment of the Acute Risk for Operators and Workers for 23 Active Ingredients applied in Protected Tomato Production

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Greenhouse production plays an important role in providing fruits, vegetables and ornamentals to the population throughout the year. Production in protected systems is advantageous because of space (Stanhill, 1980) and water savings (Stanghelini et al., 2003). Also the plant protection is favoured owing to the controlled conditions. On the other hand the systems are very intensive and the amount and frequency of pesticide applications might cause an acute risk for the operators and re-entry workers lying above the acceptable operator exposure level (AOEL).

The calculations were based on the Harmonised environmental Indicators for pesticide Risk (Garreyn et al., 2001). Data on pesticide properties were taken from the SYNOPSIS-Database<sup>1</sup> of JKI and the Footprint-Database<sup>2</sup>. For two pest control strategies three scenarios were calculated for the re-entry workers. Both scenarios I and II were calculated assuming that the re-entry workers do not use personal protection equipment like mask, gloves and overalls (PPE). In scenario I the re-entry time for workers is set to 8 hours after application and in scenario II it depends on the active ingredient (AI) applied following the code rural Article L253. A third scenario was created to assess the effect of PPE worn by re-entry workers; in this scenario also an AI dependent re-entry time was used. The risk for the operators is in all three scenarios the same, as similar assumptions were used for the calculations.

In summary, 6 out of the 23 active ingredients (AI) show a risk index (RI) above 1 for the operators, meaning the potential uptake is higher than the AOEL. These AIs are bupirimate, cyromazine, pyrimethanil, propamocarb, copper-sulphate and methomyl. For the re-entry workers in scenario I, not only the same AI as above excepted pyrimethanil have a RI higher than 1, but also chlorthalonil and pymetrozin. The delaying of the re-entry time in scenario II in dependence on the AI applied does not allow to reduce the RIs of the above mentioned AIs for the re-entry workers below 1. On the contrary, the usage of PPE by the re-entry workers causes a strong abatement of the risk. With this measure, only for copper-sulphate and methomyl the potential exposure is still slightly higher than the AOEL.

The analysis shows that some of the active ingredients applied in protected tomato production might pose a risk to operators and re-entry workers. According to the calculations, PPE is more effective in reducing the risk for re-entry workers than the AI dependent delaying of the re-entry time.

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### References:

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<sup>1</sup> Short description about SYNOPSIS <http://www.jki.bund.de/>

<sup>2</sup> <http://sitem.herts.ac.uk/aeru/footprint/>