Kaolin, lime and rock dusts to control *Drosophila suzukii*

The spotted wing drosophila, *Drosophila suzukii*, is infesting various soft-skinned fruits. Because *D. suzukii* attacks ripening fruits shortly before harvest, alternatives to insecticides with short pre-harvest intervals are needed. Therefore, the oviposition deterrence and insecticidal effects of kaolin, lime and rock dusts were tested under laboratory conditions.

**Materials & Methods**

Blueberries were treated to run-off in a spinning table spray booth with the following substances dissolved in deionized water: *Spinosad* (0.025% Audienz, Omya AG), *kaolin* (2% Surround, Stähler Suisse SA), *clinoptilolite* (2% Klinospray, Unipoint AG), *clinoptilolite* (2%) + 0.5% *Heliosol* (Omya), *calcium carbonate* (1.7 g/l, 95% pure), *calcium hydroxide* (1.7 g/l Nekapur, Kalkfabrik Netstal AG) and *diatomaceous earth* (0.34 g/l Pflanzen-Aktivator P2032, AMU-Systeme). Deionized water was applied to the control berries. Three berries were provided in cardboard cups to six *D. suzukii* females for oviposition. After 24 hours, mortality of adult flies was assessed and the number of eggs was counted under a binocular.

**Results**

Kaolin, clinoptilolite, clinoptilolite + Heliosol and calcium carbonate significantly reduced oviposition, whereas diatomaceous earth had no significant effect (Fig. 1). Calcium hydroxide had a marginal effect on oviposition (\(P = 0.07\)). In contrast to Spinosad, where almost all flies already died after 12 hours, the tested substances showed no insecticidal effects on adult flies. Kaolin reduced oviposition as effectively as Spinosad without killing the flies. The efficacy of mineral products might be based on different modes of action: (1) an oviposition deterrence due to the whitish coating, or (2) an oviposition disturbance due to small particles, or (3) in case of lime products due to an altered pH level and an altered microorganism flora.

**Conclusion**

Kaolin, lime and rock dusts offer an interesting opportunity to reduce fruit damage by *D. suzukii*. However, visible residues make the use of kaolin unsuitable in table fruits. Calcium products caused less visible residues, but could affect processing of harvested fruit due to an altered pH level. In accordance to the crop and its processing (table fruits or vinification), kaolin seems to be an interesting opportunity to control *D. suzukii* in vineyards: Field experiments show promising results. Calcium hydroxide is more suitable for berry or cherry production: Field experiments show good results in raspberry production.