Vegetable leafminer fly, *Liriomyza sativae* Blanchard

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The vegetable leafminer fly, *Liriomyza sativae* Blanchard, is a pest species from Central and North America, which had since the 1990s spread with infested plants to many parts of the world. In the tropics, subtropics and warmer parts of the temperate zone it has been established in the field, while in a colder climates of the northern hemisphere it has become a pest in greenhouses. Life cycle is completed between 15 ºC (40.2 days) and 30 ºC (12.4 days), with the optimum temperature for overall population growth between 25-30 ºC. *L. sativae* is a polyphagous pest of plants from nine plant families. Adults and larvae cause injuries to the plant foliage. *L. sativae* is reported as economically damaging on a wide variety of ornamental and vegetable crops (snow peas, sugar snap peas, French beans, tomatoes and potatoes). Yield losses range from 10 – 100%. The presence of unsightly larval mines and adult punctures in the leaf palisade of ornamental plants can further reduce crop value and rejection. The establishment risk index (ERI), the generation index (GI), and the activity index (AI) allow to predict and explain the future distribution and abundance potential of the pest under different climate change scenarios. An ERI of 0.8-1 reflects well the global distribution of *L. sativae* in the year 2000; further the high number of generations (GI>17) and the population growth (AI>20) of the species can be well predicted in tropical regions. Global predictions for 2050 indicate a potential reduction in the high-risk areas (ERI>0.8) in tropical zones and a slight range expansion to warmer subtropical areas but still with a low establishment potential of the pest (ERI of 0.6-0.8). Also, an increase of 2–4 generations can be potentially expected in most subtropical and tropical regions, as in North America (Mexico, southern USA), Central and South America, Africa, Asia (Middle East, south and Southeast Asia), southern Europe (Portugal, Spain) and Oceania. A high increase (AI>20) of the potential growth of *L. sativae* is predicted for tropical regions of central and South America, sub-Saharan Africa and Asia; instead increasing temperature along the Equator will potentially reduce *L. sativae* activity. Early predictions could help to adapt to climate change by developing and supporting farmers with adequate pest management strategies to reduce greater crop and quality losses. Adapting to avoid risk at the farm level implies an ecological and economic control of leafminer based on integrated pest management by promoting natural regulation and combining cultural practices with physical and chemical control.

Greenhouse Whitefly, *Trialeurodes vaporariorum* (Westwood)

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The greenhouse whitefly, *Trialeurodes vaporariorum* (Hemiptera: Aleyrodidae) is a widely distributed pest of ornamental and horticultural plants with over 250 genera of 85 plant families. Greenhouse whitefly is found widely around the world, including most of the temperate and subtropical regions of North America, South America, Europe, Central Asia and India, northern and eastern Africa, New Zealand and southern Australia. It does not thrive in most tropical locations, and occurs in colder regions only by virtue of its ability to survive winter in greenhouses. The origin of this species is not certain, but is thought to be Mexico or the southwestern United States. Whiteflies damage plants directly by sucking sap from leaves and indirectly by transmitting viruses and producing a sticky secretion known as honeydew, which prevents crops from functioning normally, as well as acting as a substrate for fungal growth (sooty moulds). Life cycle is completed between 15 ºC (46.71 days) and 28 ºC (21.87 days), with the optimum temperature for overall population growth ranged between 20 and 24 ºC. The establishment risk index (ERI), the generation index (GI), and the activity index (AI), allow to predict and explain the future distribution and abundance potential of the pest under different climate change scenarios. Regions with an ERI >0.6 reflects well the current global distribution of *T. vaporariorum* in the year 2000 in tropical and subtropical areas. Global predictions for 2050 indicate a potential reduction of high-risk areas (ERI>0.8) in tropical regions. A slight range expansion to subtropical and more temperate regions of Asia, North America, and Europe will get more suitable but still at a very low (ERI<0.45). A decrease in the number of