

**Vector-Borne Diseases: Impact of Climate Change on Vectors and Rodent Reservoirs**  
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## **Climate change as a potential cause of the occurrence of potato stolbur in Germany**

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Phytoplasmas are wall-less and non-helical bacteria of the class Mollicutes. Bois noir in grapevine and potato stolbur are caused by phytoplasmas of the stolbur (16Sr-XII-A) group and transmitted by the planthopper *Hyalesthes obsoletus*, a southern European, xerothermic species. In Germany it was long restricted to viticultural sites on the steep slopes of the river valleys of Rhine and Mosel until it spread recently to climatically less favorable areas. Since average temperature increased significantly, e.g. by 1.7 °C within the last 40 years in the Mosel valley, this range expansion is thought to be related to changing climatic conditions. The capability of *H. obsoletus* to inoculate potato plants with stolbur has been confirmed by transmission experiments.

The potato stolbur phytoplasma has quarantine status in the European Union (Status: EPPO A2 list, Nr. 100, EU Annex designation II/A2). Germany was considered to be free from potato stolbur even though the vector and the pathogen appeared in vineyards. The disease was first detected in Hesse in 2006 and occurred in Rhineland-Palatinate and Lower Saxony in 2007. *H. obsoletus* was found on some of the affected sites. A noteworthy loss of yields due to potato stolbur is not to be expected in the near future. However, because of the quarantine status of potato stolbur and its adverse effects on tuber quality growers should keep an eye on the further development of the disease

The fact that stolbur phytoplasma and its vector were present for a long time at viticultural sites but occurred just recently in potatoes appears contradictory. However, potatoes are grown in areas where ambient temperatures were not sufficient for the vector to complete its life cycle. Changing climatic conditions could have allowed *H. obsoletus* not only to spread to new viticultural sites but also to potato growing areas with a rather mild climate. Since early maturing varieties are grown there, stolbur symptoms might become visible only in years when high spring temperatures lead to an exceptionally early flight of *H. obsoletus* and an inoculation of the potato plants ahead of the normal time in July. This could allow symptoms to develop before harvest. Symptoms of potato stolbur closely resemble that of *Verticillium*- and *Colletotrichum*-wilt or of black scurf caused by *Rhizoctonia solani* (common diseases for local potato production). Therefore, a confusion of the three diseases with stolbur by growers is quite imaginable.

