

Species Distribution Modelling Reveals Invasion Risk of Tropical Root-Knot Nematodes in European Agriculture

As winters become milder, tropical root-knot nematodes (RKN) will expand their ranges from the Mediterranean region in northern directions. Our species distribution modelling predicts in considerable detail more northern European regions that are favourable for tropical RKN establishment. Due to their extreme wide host range, tropical RKNs might develop into a significant threat as well to crops that are produced in these regions. Early detection and proactive management strategies are essential to mitigate potential yield and quality losses.

Main Outcome: Farmers and agricultural advisors should monitor the presence of RKN infestations (e.g., the presence of galled roots), especially in regions identified as high-risk by our models (see interactive maps at https://nem-emerge.eu/interactive-maps/Tropical_new.html). Growing resistant plant varieties or poor hosts, and application of soil health promoting practices can reduce the likelihood of tropical RKN establishment and spread.

Expected Impact: Our assessment of invasion risks of tropical RKNs is not intended as an alarm bell, it rather allows farmers, agricultural advisors and plant breeders to prepare themselves. The range of expansion of tropical RKNs is a relatively slow but barely stoppable process. Monitoring is essential. We also envision a crop range-shift strategy, where vulnerable crops are produced in the areas with low invasion risk (grid cells of the interactive map).

Target Audience: Farmers, agricultural advisors, plant breeders and agricultural policymakers.

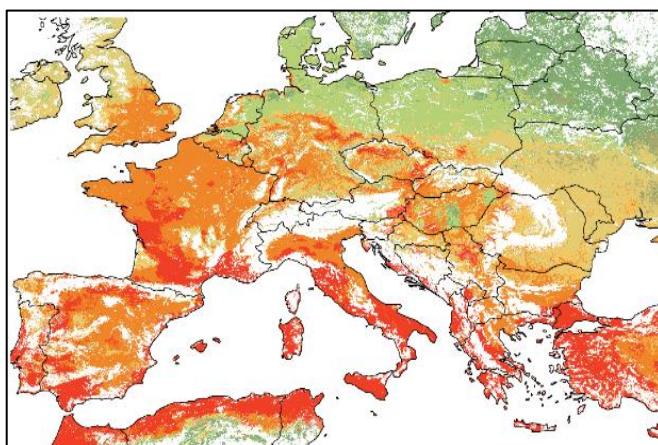


Figure 1: Potential root-knot nematode threat or invasion risk in Europe agriculture. Colours: Red (high risk), orange (moderate risk) and green (low risk).

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