

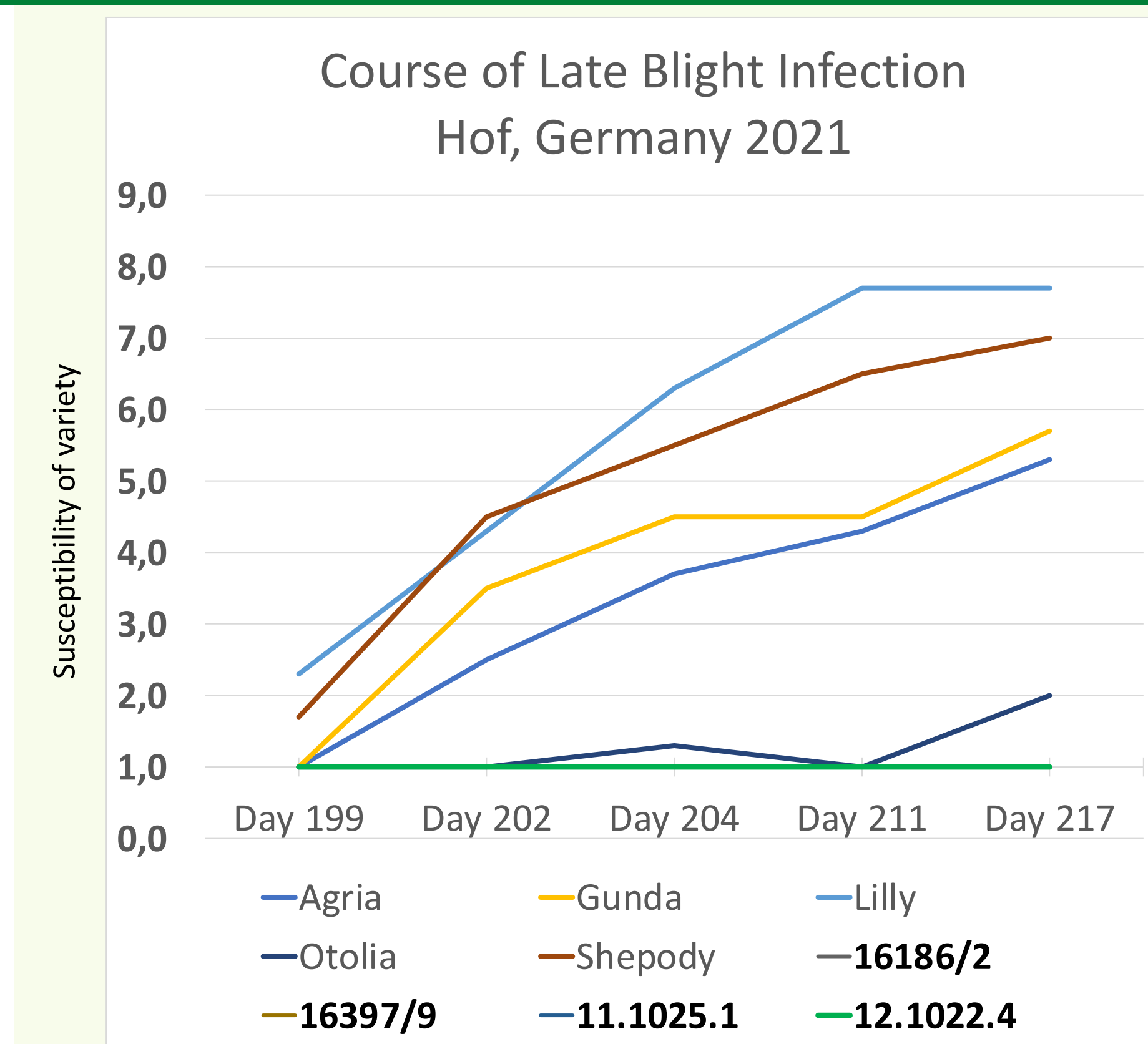
# New Potato Cultivars with Broad Late Blight Resistance

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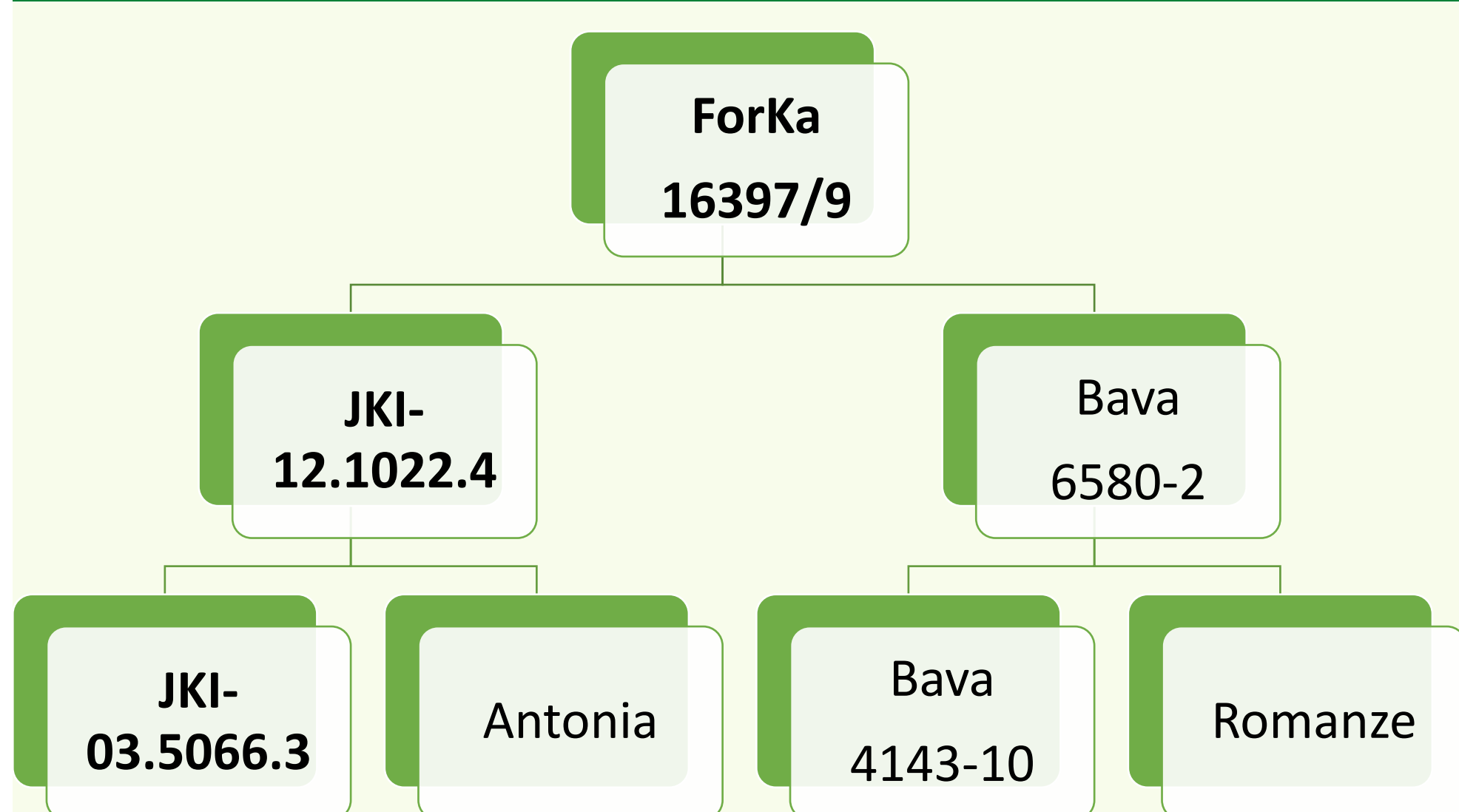
16397/9



16186/2



## Single Donor

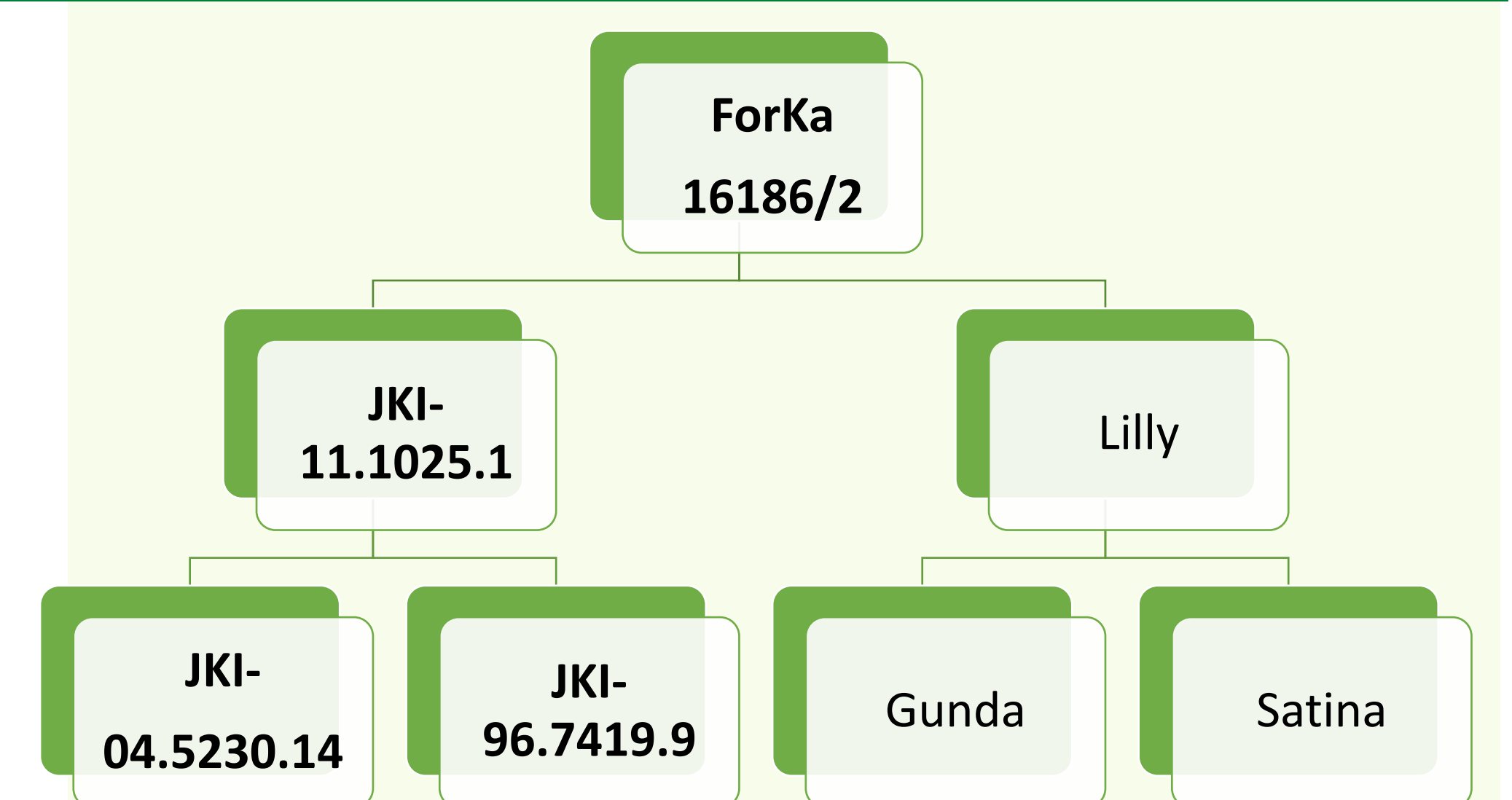


16397/9 displays *P.i.* resistance from *Solanum circaeifolium*. Resistance is passed on through JKI prebreeding clones 12.1022.4 and 03.5066.3. R-donors are highlighted.

## Exploring Pedigree

Organic farming requires potatoes with high resistance to *Phytophthora infestans* (*P.i.*). In addition, cultivars need to be tolerant to low levels of nitrogen, draught and mechanical weed control. Since 2012 participatory on-farm selection has been implemented to promote the development of new suitable food-grade potato cultivars. 10 years later, based on prebreeding material from the Julius Kühn-Institute (JKI), the first varieties with stress tolerance and *P.i.*-resistance are being registered at the German Bundessortenamt.

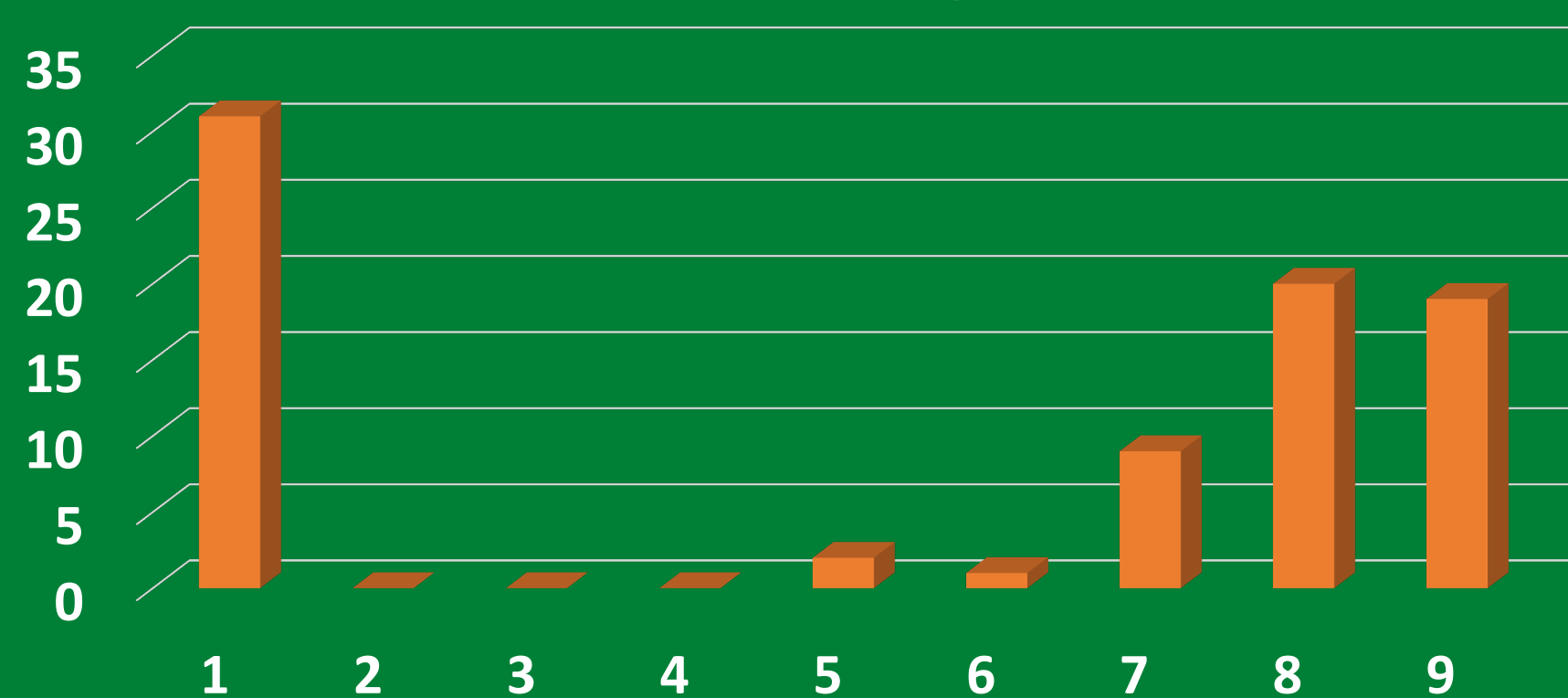
## Multiple Donors



The 16186.2 R-gene-donor 11.1025.2 contains genetics from *Solanum demissum*, *S. andigena*, *S. acaule* (04.5230.14), and *S. okadae* (96.7419.9).

## Vertical versus Horizontal

*P.i.* Susceptibility of JKI-12.1022.4 Progenies



JKI-12.1022.4 progenies of the second field generations in Landberg am Lech (Germany) in 2018. Plants were assessed twice during the late blight epidemic. Mean values are displayed in the graph. x-values: Susceptibility 1 (low) to 9 (high); y-values: number of clones.

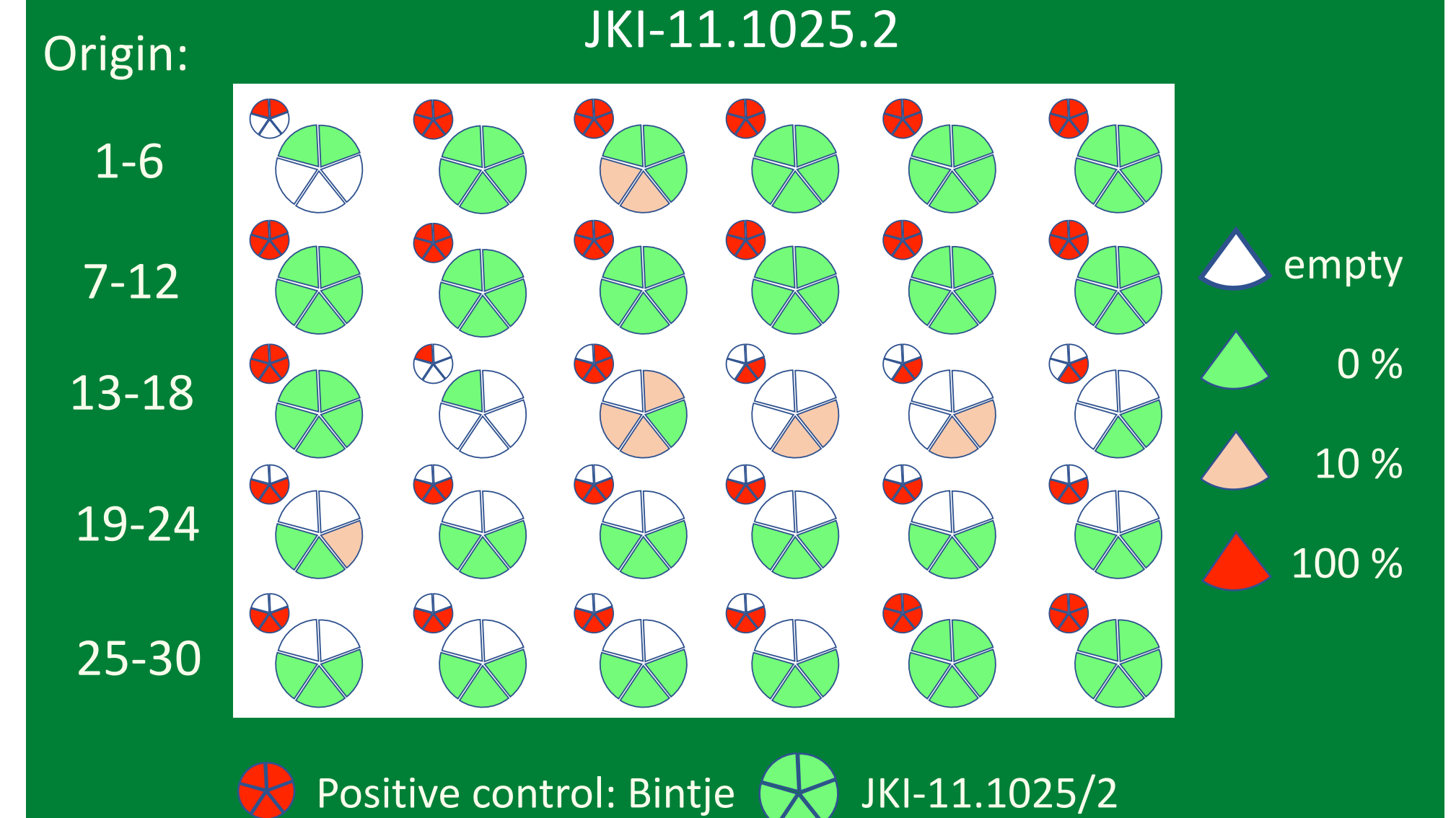
## Exploring Resistance

**Left:** Field assessment of *P.i.* infection shows the segregation of the progeny in two distinct groups of highly resistant and highly susceptible plants. This strongly suggests that a vertical resistance with a single resistance hotspot is passed on by the JKI R-Gene donors 03.5066.3 and 12.1022.4.

**Right:** The detached leaf test of 11.1025.1 displays a broad resistance across different European *P. infestans* lineages. Field results suggest a similarly broad resistance of 16186/2. To gain more information breeding clones of the lineage will be further analysed with RNA-sequencing.

## Broad versus Narrow

Virulence of *Phytophthora infestans* against JKI-11.1025.2



Percent of dead tissue of inoculated detached leaves of JKI-11.1025.2 on water agar. 30 European *P.i.* origins with 1-5 isolates each. Origins: Control (1), NL (2-10), PL (11-12), D (16-24), B (25-26), F (27-28), GB (29-30).

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