Czech University of Life Sciences Prague
Faculty of Agrobiology, Food and Natural Resources

CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Occurrence of *Plasmodiophora brassicae* Wor. and virus diseases of winter oilseed rape (*Brassica napus* subs. *napus*) in the Czech Republic

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Clubroot, caused by *Plasmodiophora brassicae* (Wor.), has been spreading on winter oilseed rape (*Brassica napus* L.) in the Czech Republic over the past six years. Clubroot infestation and spread were monitored over five years and maps of infestation were created. Experiments with clubroot resistant cultivars of winter oilseed rape were carried out in the field and greenhouse. In the greenhouse, six resistant cultivars were grown in infested soil collected from various fields in the Czech Republic, and assessed for disease severity. The soil samples were also tested for the presence and amount of *P. brassicae* inoculum by conventional and quantitative PCR analysis. In the field experiment, seven resistant cultivars were grown and disease development was monitored monthly. Yields were measured at the end of the cropping season. Finally, a set of 17 *P. brassicae* field isolates from across the Czech Republic was assessed for pathotype designation on the differential hosts of Williams, Somé et al., and the European Clubroot Differential set. The information obtained on the effectiveness of host resistance and pathogenic diversity of *P. brassicae* populations from the Czech Republic may help to more effectively manage clubroot in this country.

In autumn 2016 the unusually high abundance of green peach aphid (*Myzus persicae*) occurred on oilseed rape fields across the Czech Republic. This species is a vector of *Turnip yellows virus* (TuYV) and *Turnip mosaic virus* (TuMV), which are commonly found on oilseed rape. The nationwide monitoring of these two viruses was made using Triple Antibody Sandwich Enzyme-Linked ImmunoSorbent Assay (TAS-ELISA) and Double Antibody Sandwich ELISA (DAS-ELISA). The test revealed high occurrence of TuYV with 93.7 % of tested samples being positive. On the other hand, the occurrence of TuMV was very low with just 0,2 % of samples positive. The spring monitoring of virus occurrence is planed as well as testing of oilseed rape cultivars, which are considered as resistant.

Symptomes of clubroot caused by *Plamodiophora brassicae*

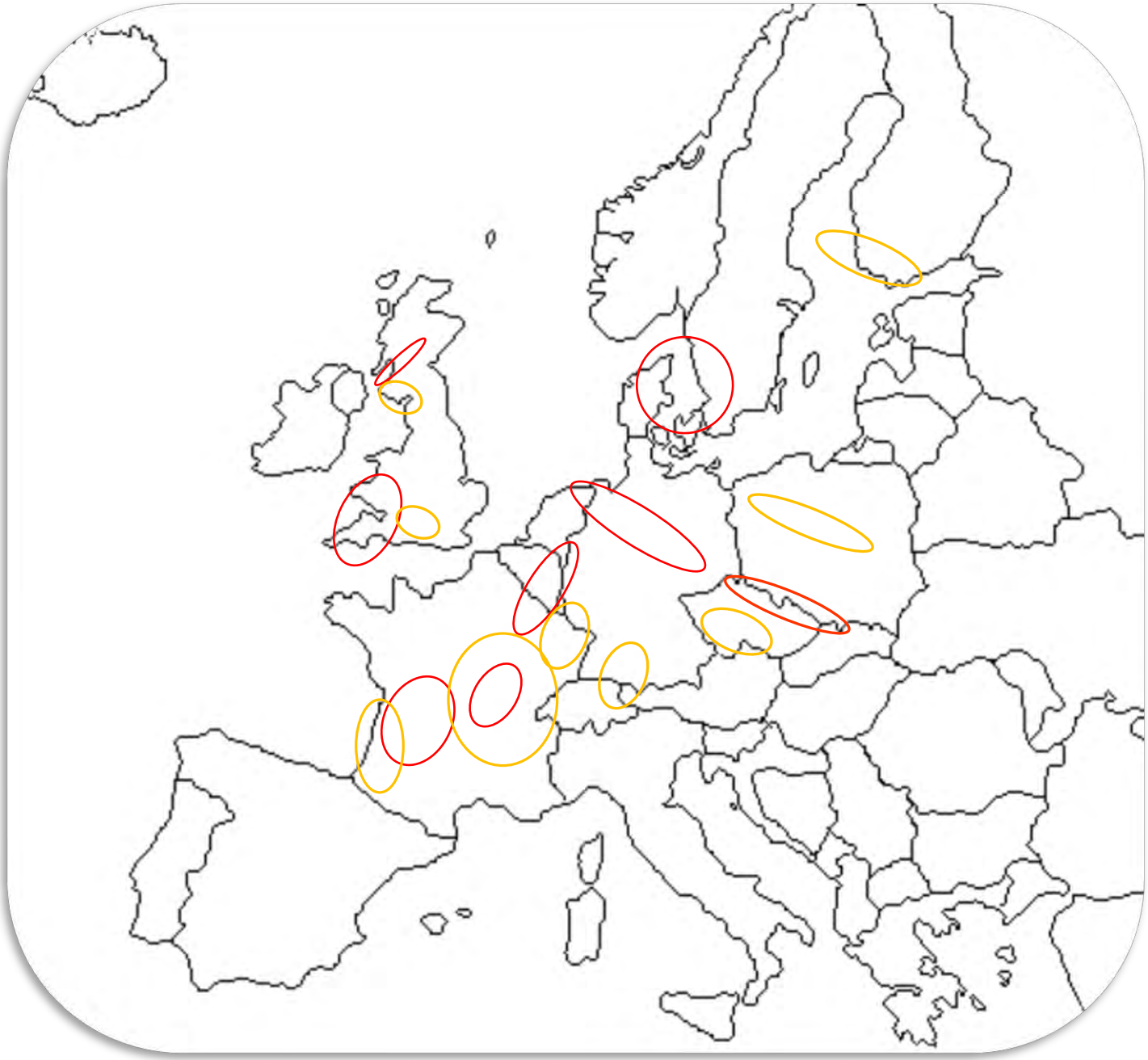

Autumn 2014


Spring 2015

Worldwide occurence

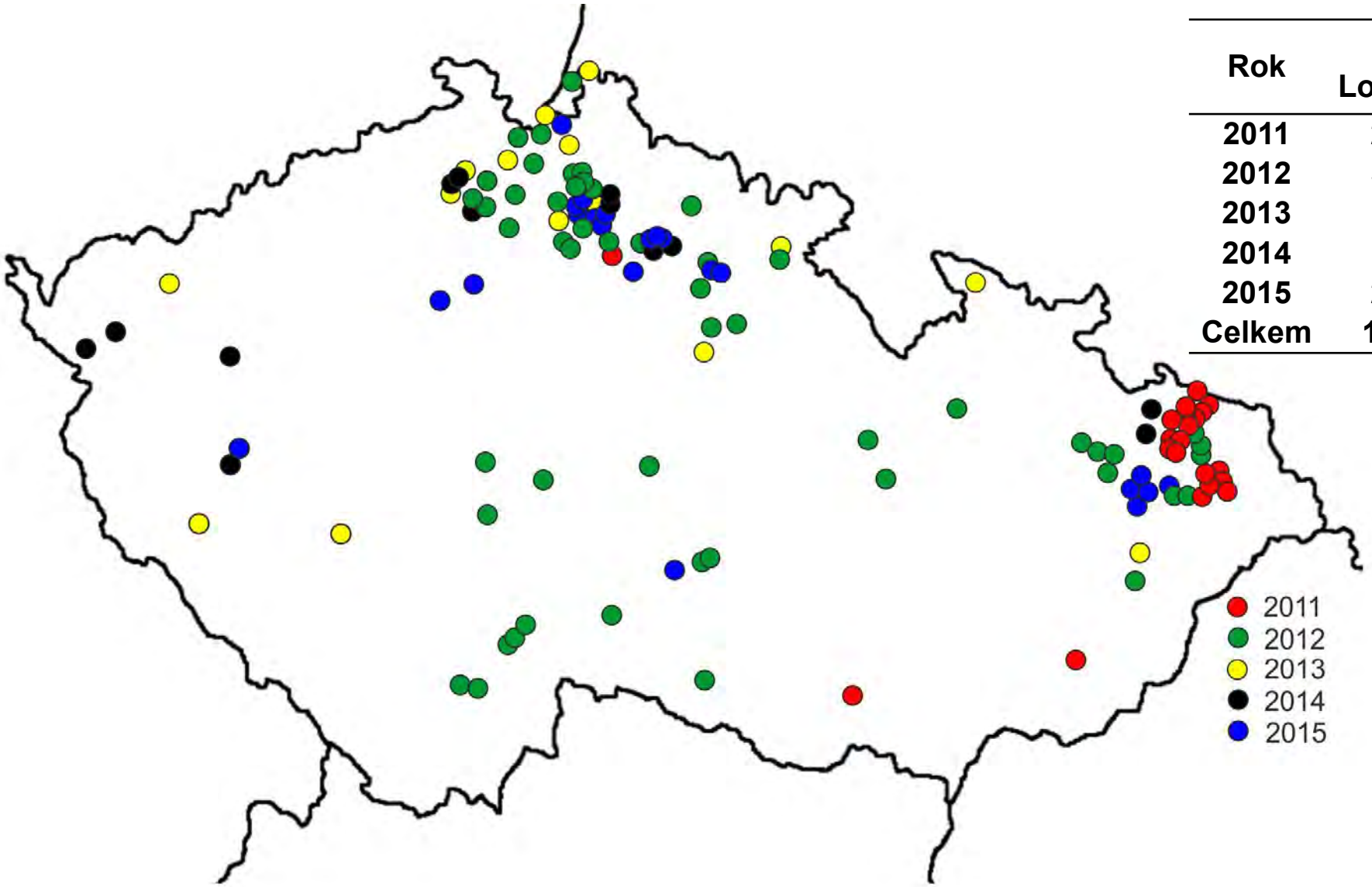
http://levitycropscience.com/author/pranav92/

Europe



Diederichsen (2010)

Monitoring of *P. brassicae* occurrence in CZ

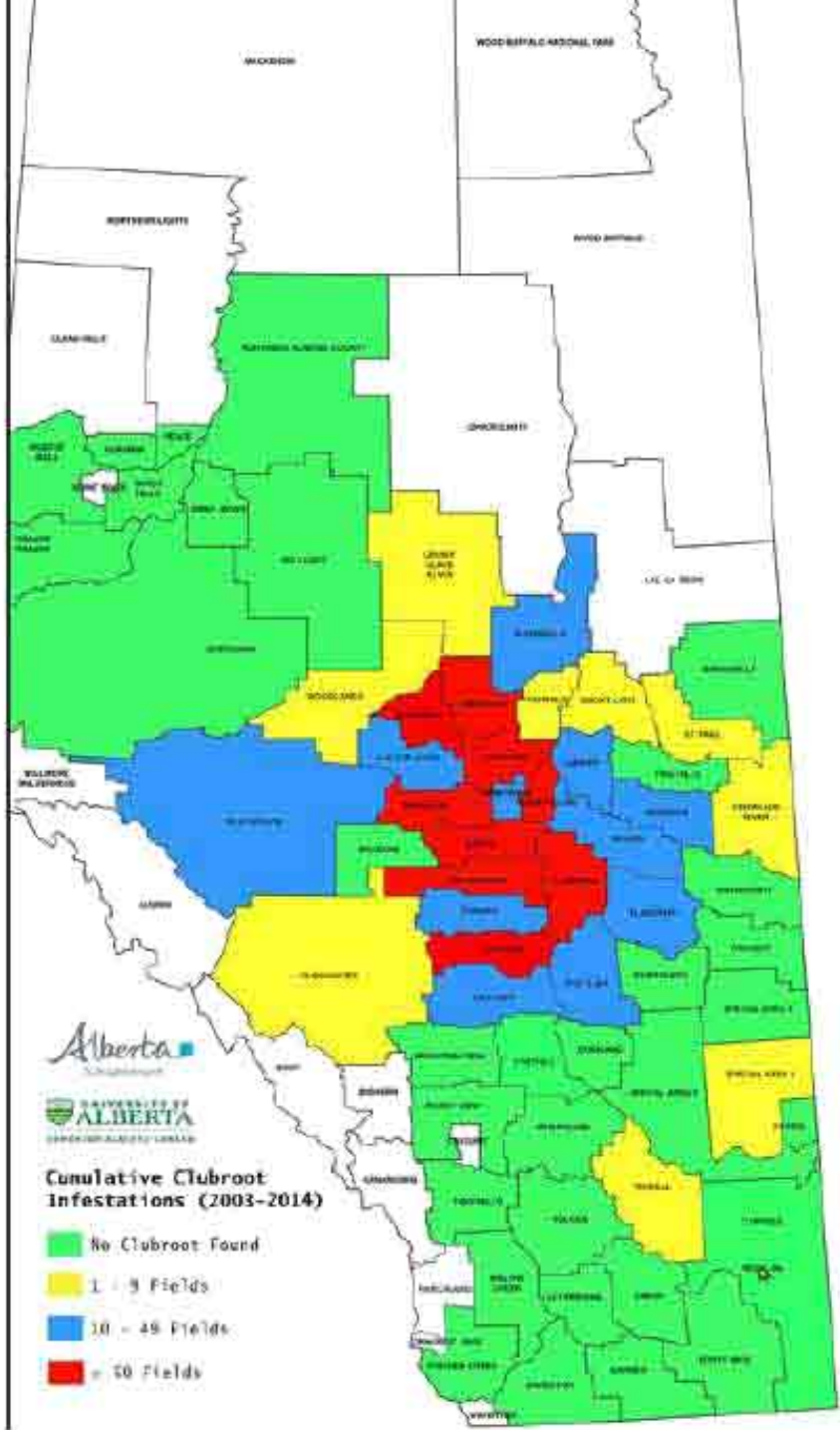


Rok	N Lokalit
2011	23
2012	55
2013	15
2014	12
2015	25
Celkem	130

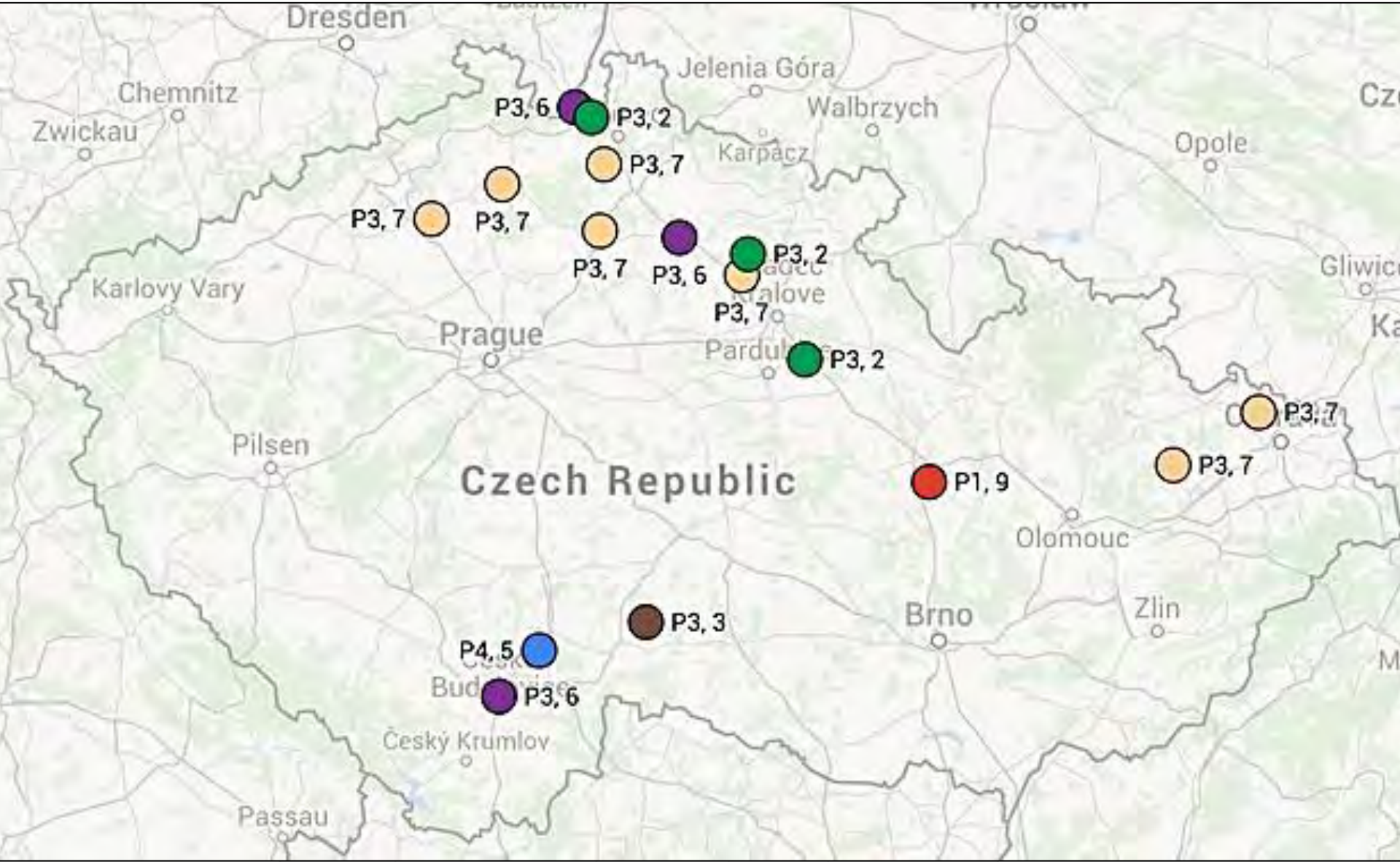
2011 - 2015


Liberec
Ústí n. L.
Liberecký reg.
Královéhradecký reg.
Karlovy Vary
Karlovarský reg.
Hradec Králové
Praha
Pardubice
Středočeský reg.
Pardubický reg.
Ostrava
Plzeň
Olomoucký reg.
Moravskoslezský r.
Olomouc
Vysočina reg.
Plzeňský reg.
Jihlava
Jihočeský reg.
Zlín
Brno
Zlínský reg.
České Budějovice
Jihomoravský reg.
Počet lokalit
0
1 – 5
6 – 10
11 – 15
16 – 25

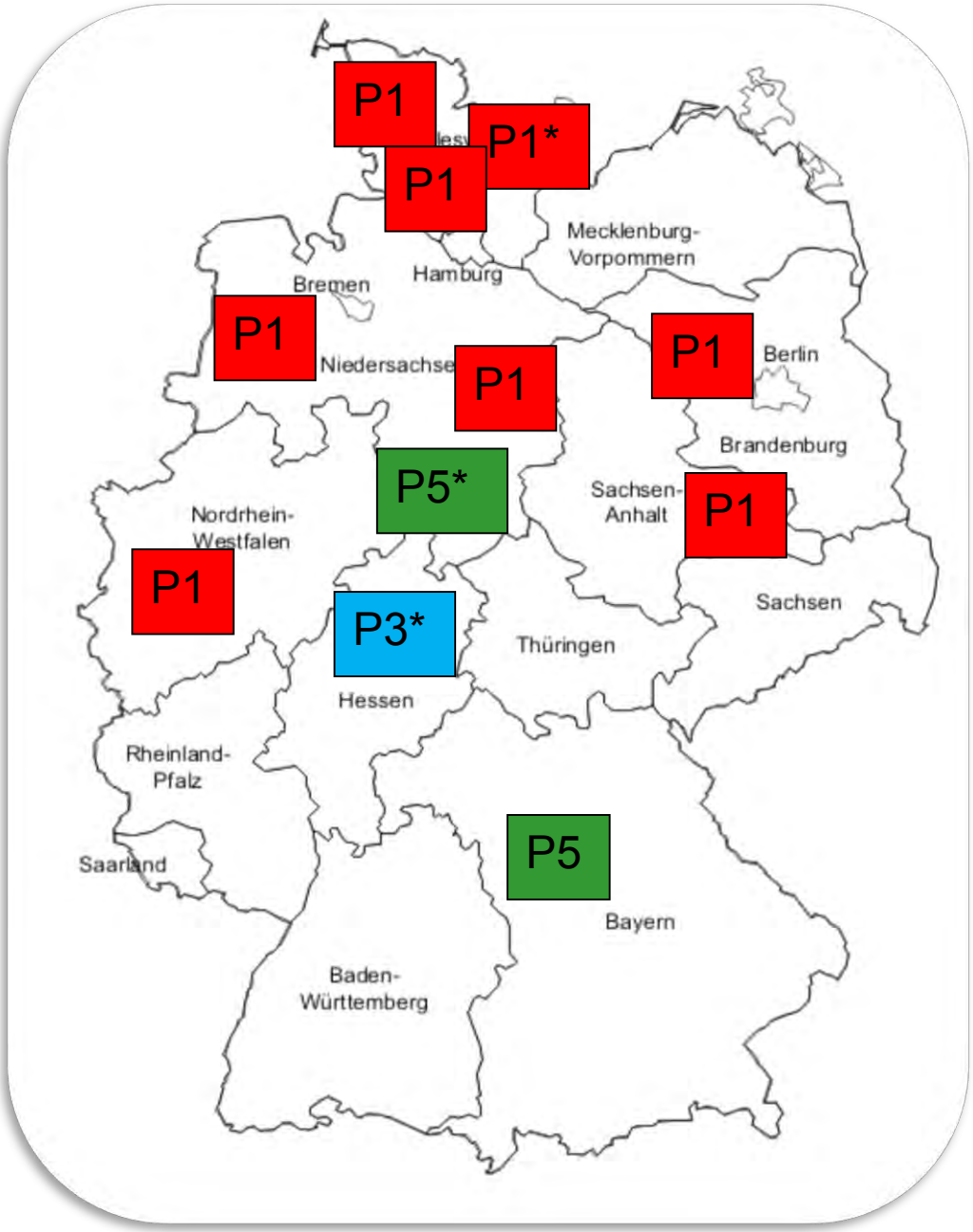

UNIVERSITY OF ALBERTA
Alberta Government
Cumulative Clubroot Infestations (2003-2012)
Not Surveyed
No Clubroot Found
1 - 9 Fields
10 - 45 Fields
>45 Fields
Yellowhead County
County of Athabasca
County of Minburn
County of Vermilion River
Beaver County
Special Area 3
County of Newell
Cypress County
Kilometers
0 45 90 180 270
N


Alberta
UNIVERSITY OF ALBERTA
Cumulative Clubroot Infestations (2003-2014)
No Clubroot Found
1 - 9 Fields
10 - 45 Fields
> 50 Fields

Plasmodiophora brassicae pathotype detemination in CZ



German pathotypes



P1

P1* Infestation on ‘Mendel’

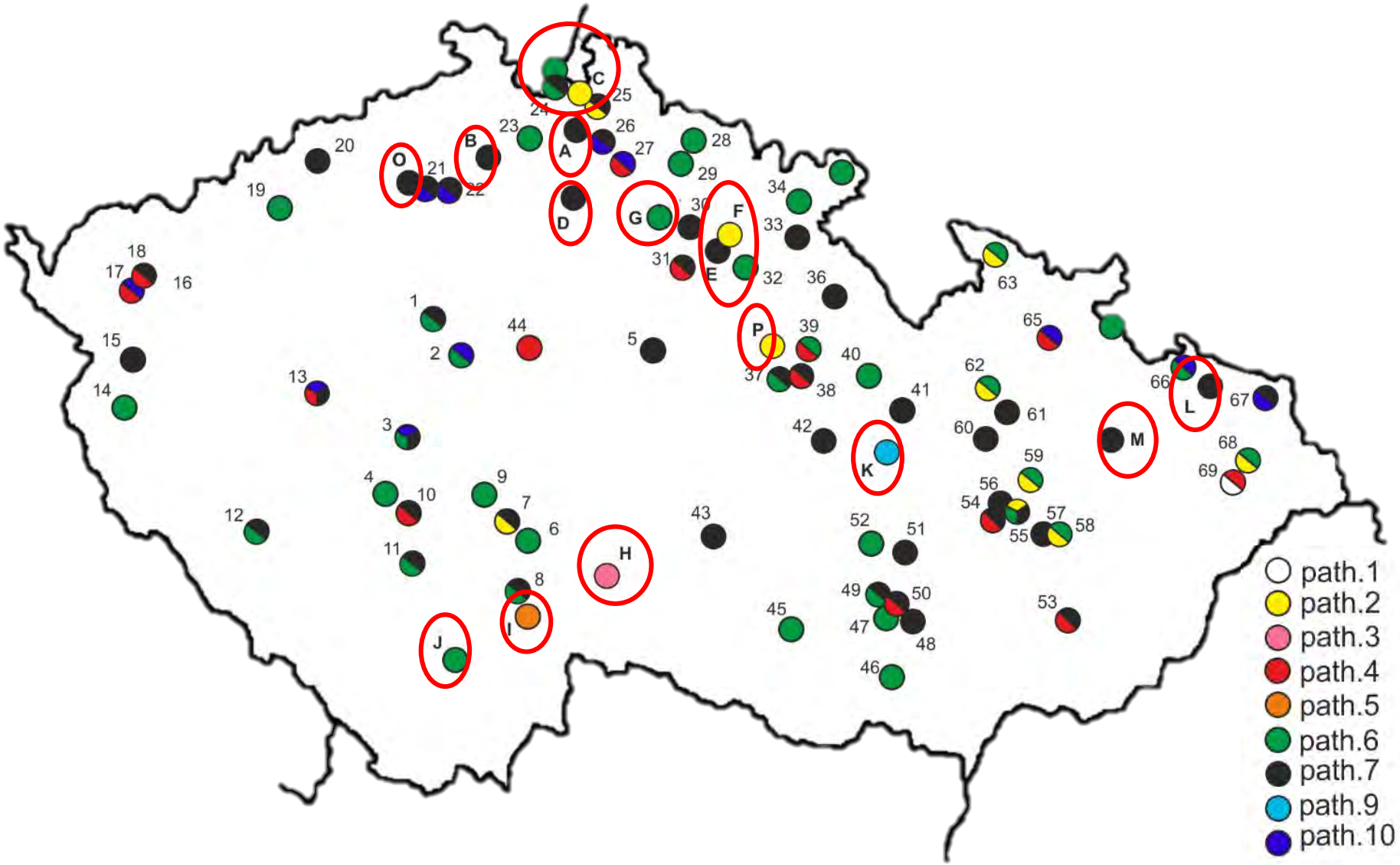
P3* Infestation on ‘Mendel’

P5

P5* Infestation on ‘Mendel’

Diederichsen (2014)

Rod 1986-87, Řičařová et al. 2016



Field trials with Clubroot resistant cultivars

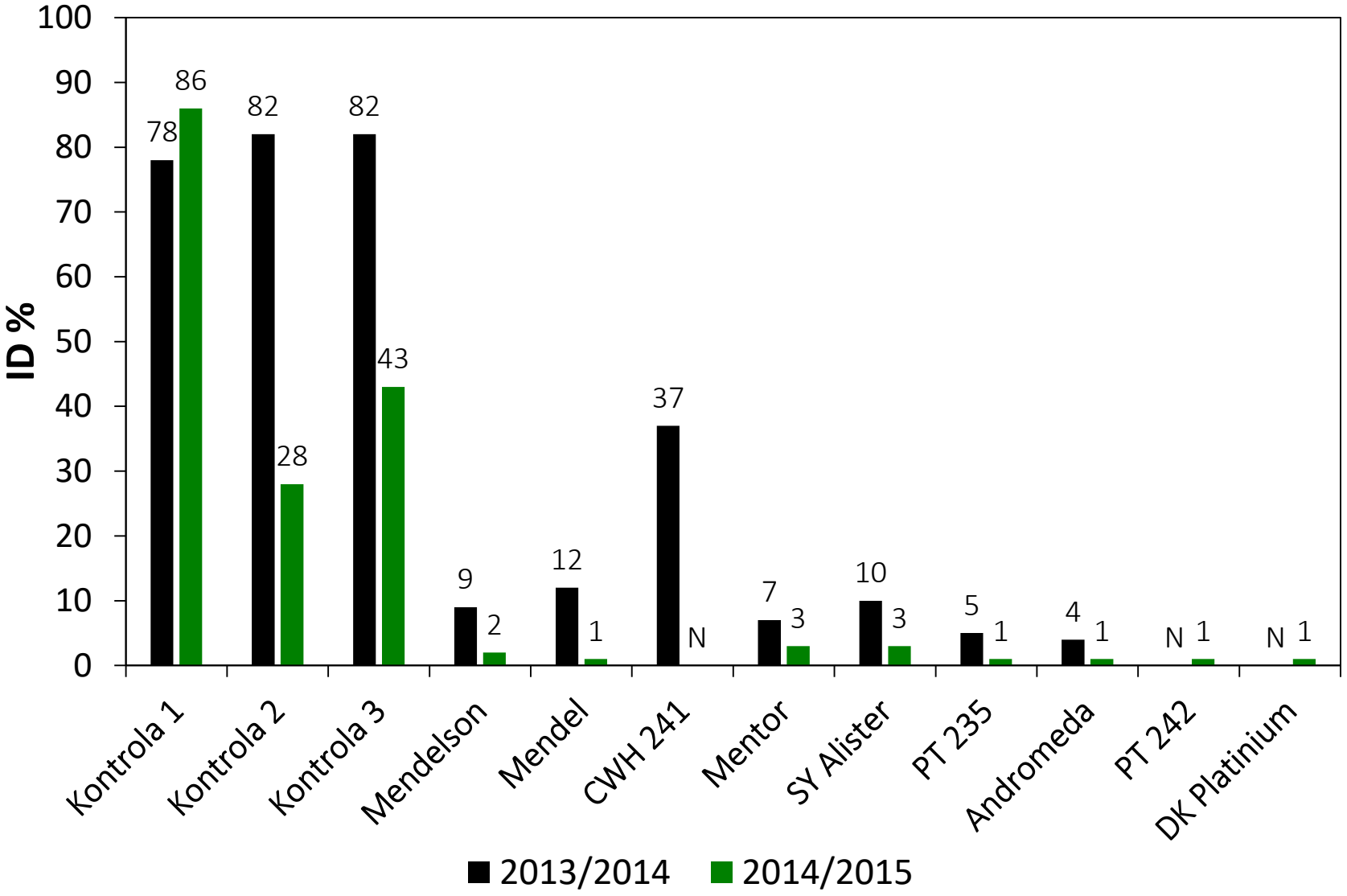
- **Two infested fields (1,5 a 2,5 ha)**
- **Sawn: 26. 8. 2013, 17. 8. 2014**
- **Check of roots (30 plants) – 3x autumn, 1x spring**
- **ID – index of disease**

Experimental design

Season	1	2	3	4	5	6	7	8	9	10	11
2013/2014	SY Alister	Susceptible 1	CWH 241	Mentor	Andromeda	Susceptible 2	Mendelson	Mendel	PT 235	Susceptible 3	x
2014/2015	SY Alister	Mentor	Susceptible 1	Mendelson	Mendel	Susceptible 2	PT 242	PT 235	CWH 298	Andromeda	Susceptible 3

Pods ripening

Results of Field trials



Average ID % - Index of disease