

Identification of factors which may be influencing the incidence of blackleg in Scottish seed potatoes

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SASA & AHDB Potatoes

Outline

- The Scottish Seed Classification Scheme
 - Blackleg trends, the causative organism and its impact across seed generations
- Factors which may influence blackleg incidence and severity
 - Previous history and environmental conditions
 - Other factors?
- Survey of pre-basic (PB) growers
 - Aims, key findings and corroborating evidence
- Conclusions and next steps

The Scottish Seed Potato Classification Scheme (SPCS)

Nuclear Stock
(pathogen-free microplants)



Union grade PBTC
(microplants / mini-tubers)



Union grade PB
(Up to 4 field generations)



Union grade S
(Up to 5 field generations)



Union grade SE
(Up to 6 field generations)



Union grade E
(Up to 7 field generations)

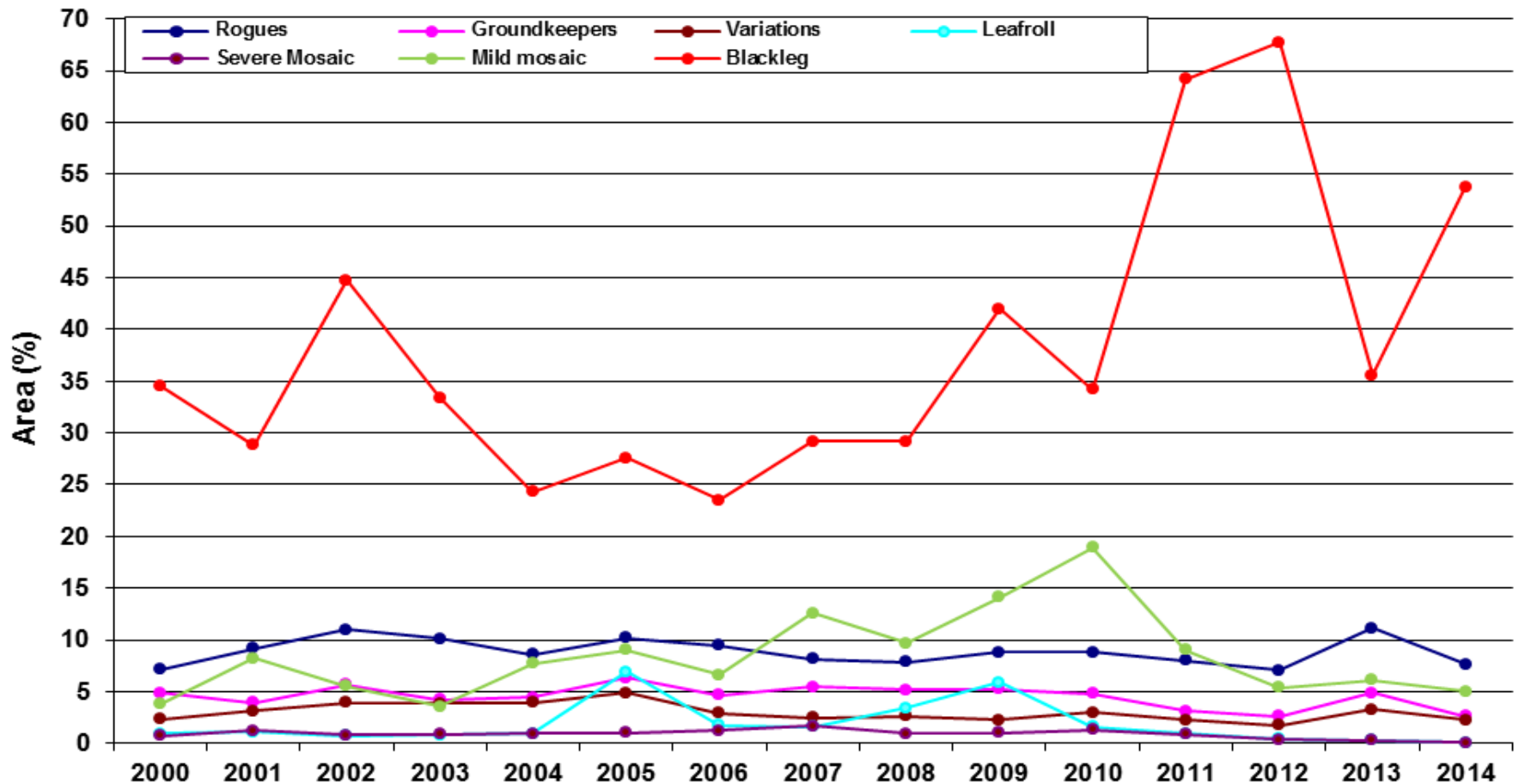
Pre-Basic

Basic

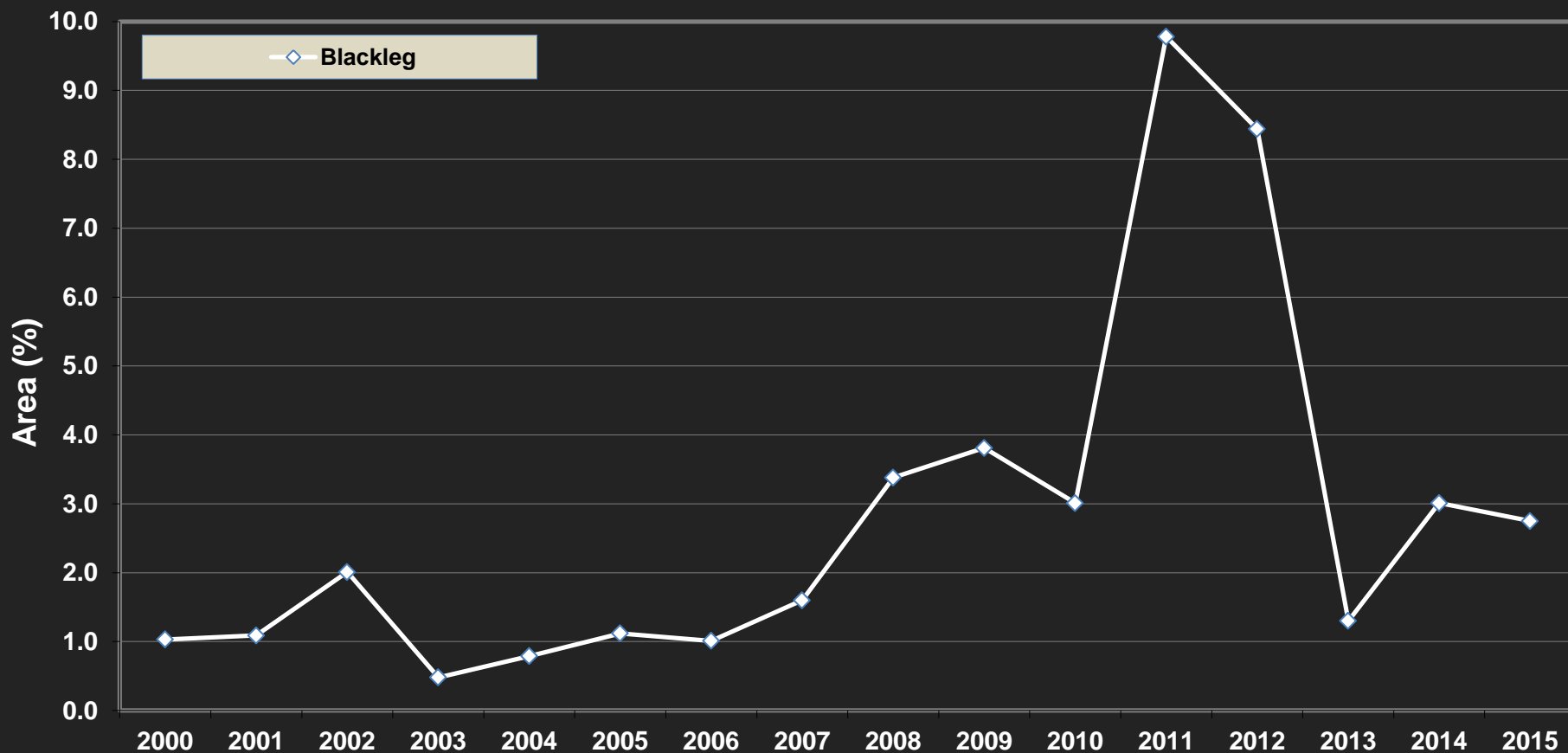


Classes for Scottish Seed Potatoes

Faults recorded by field inspection of seed crops (2000 – 2014)



Seed area not holding grade due to blackleg (2000-2015)

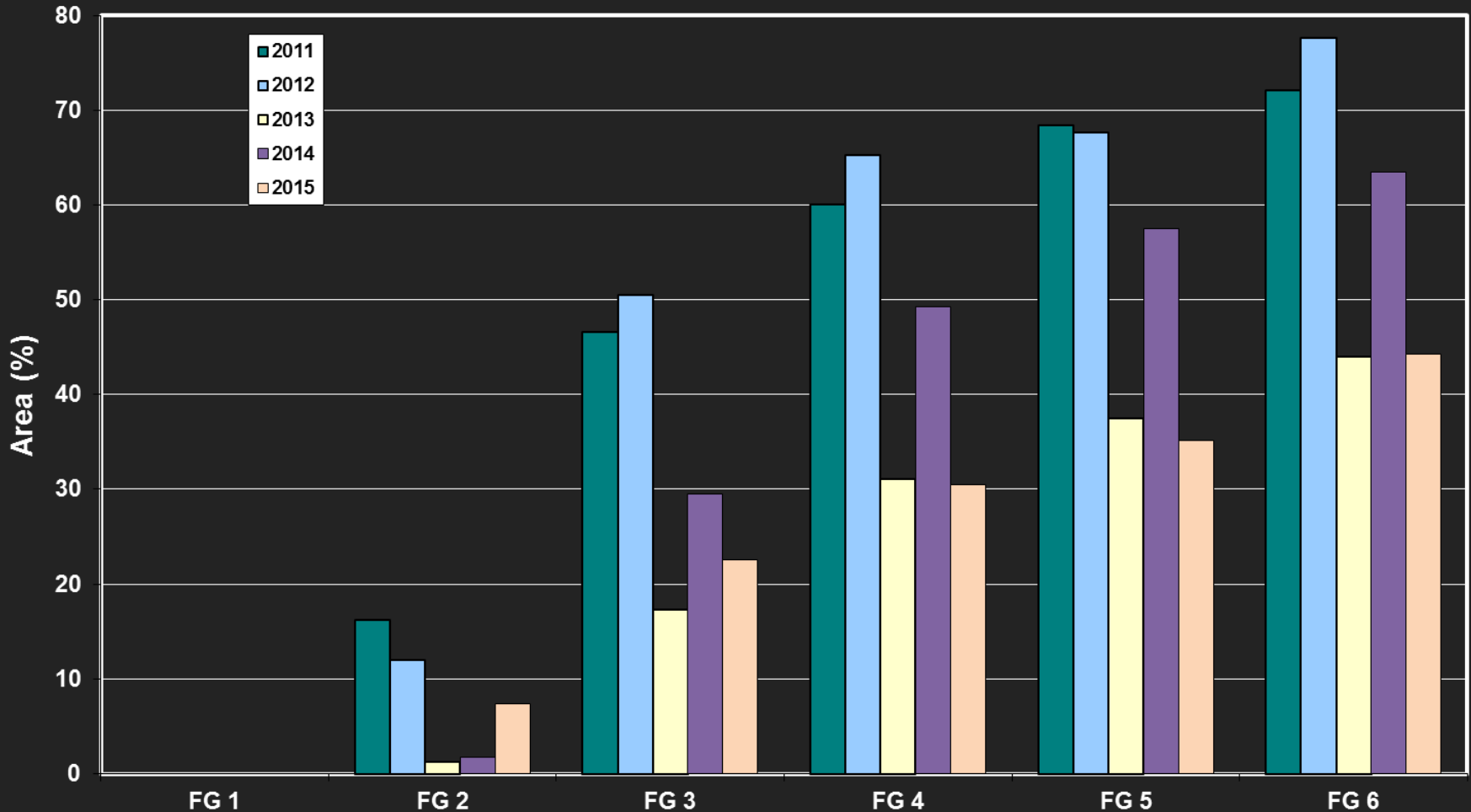


Blackleg incidence in seed and its causative organisms in Scotland

	2010	2011	2012	2013	2014	2015
% seed stocks with blackleg	31.5	49.2	52.7	32.3	42.3	29.3
% blackleg caused by <i>D. solani</i>	0	0	0	0	0	0
% blackleg caused by <i>D. dianthicola</i>	0	0	0	0	0	0
% blackleg caused by <i>P. atrosepticum</i>	93.8	96.3	95.5	96.4	96.8	95.2
% blackleg caused by other <i>Pectobacterium</i> spp.*	6.2	3.7	4.5	3.6	3.2	4.8

* , *P. carotovorum* subsp. *carotovorum* and *P. wasabiae*. Not tested for '*P. carotovorum* subsp. *brasiliensis*'

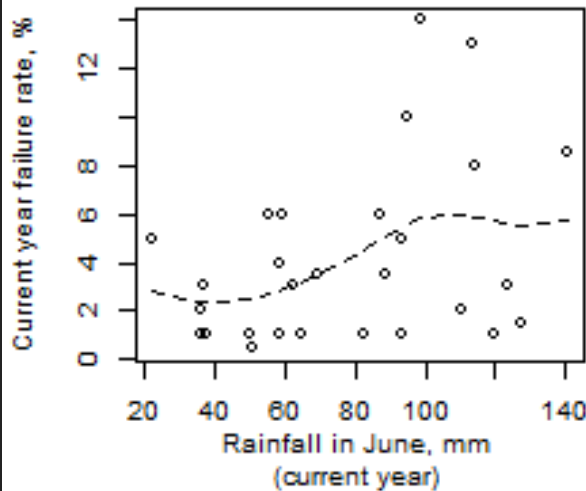
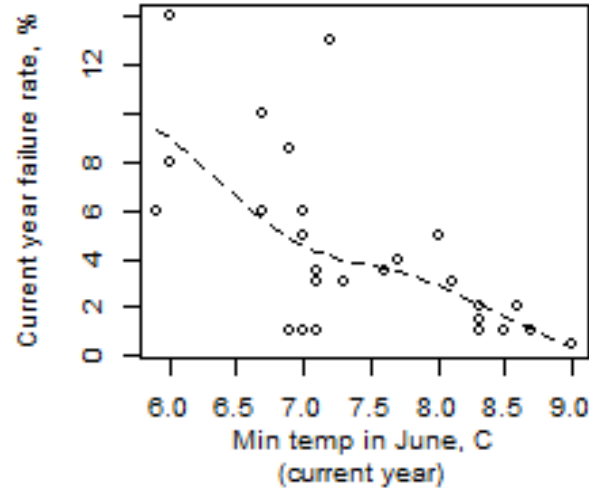
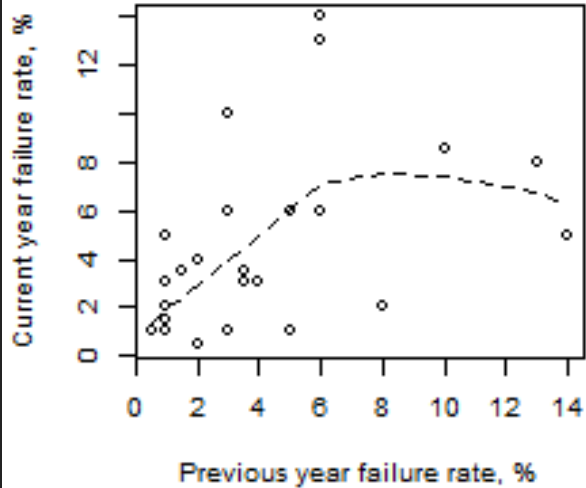
Blackleg by field generation (FG) 2011-2015



Percentage of PB stocks infected by *P. atrosepticum*

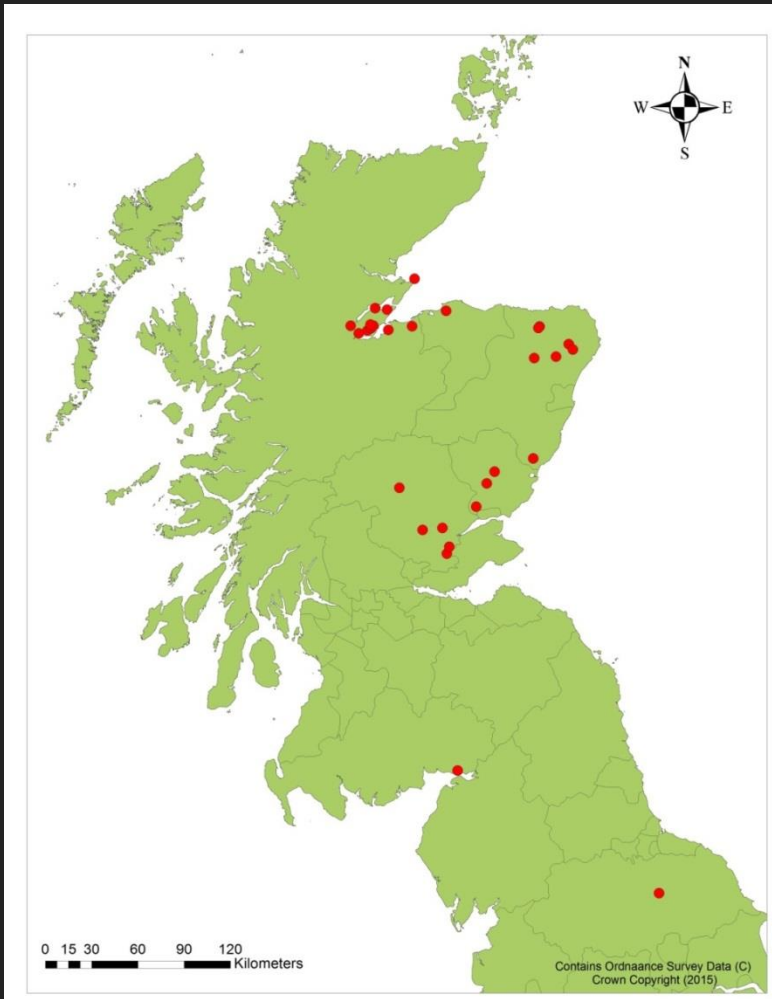
Grades	2013/14	2014/15	2015/16
PB1*	14 (57) [†]	2 (50)	20 (54)
PB2	50 (6)	33 (9)	33 (18)
PB3	44 (9)	60 (20)	65 (17)
PB4	100 (3)	100 (7)	0 (1)

* , PB1 equates with FG1, etc.. † , Number of crops tested in brackets



Possible factors affecting blackleg in Scotland (1983-2013)

Blackleg Survey of PB Growers



Location of PB interviewees for AHDB Potatoes Blackleg study

Aim:

- Investigate social changes/industry practices with a view to identifying contributing factors which may be leading to a rise in blackleg, particularly in PB growers.

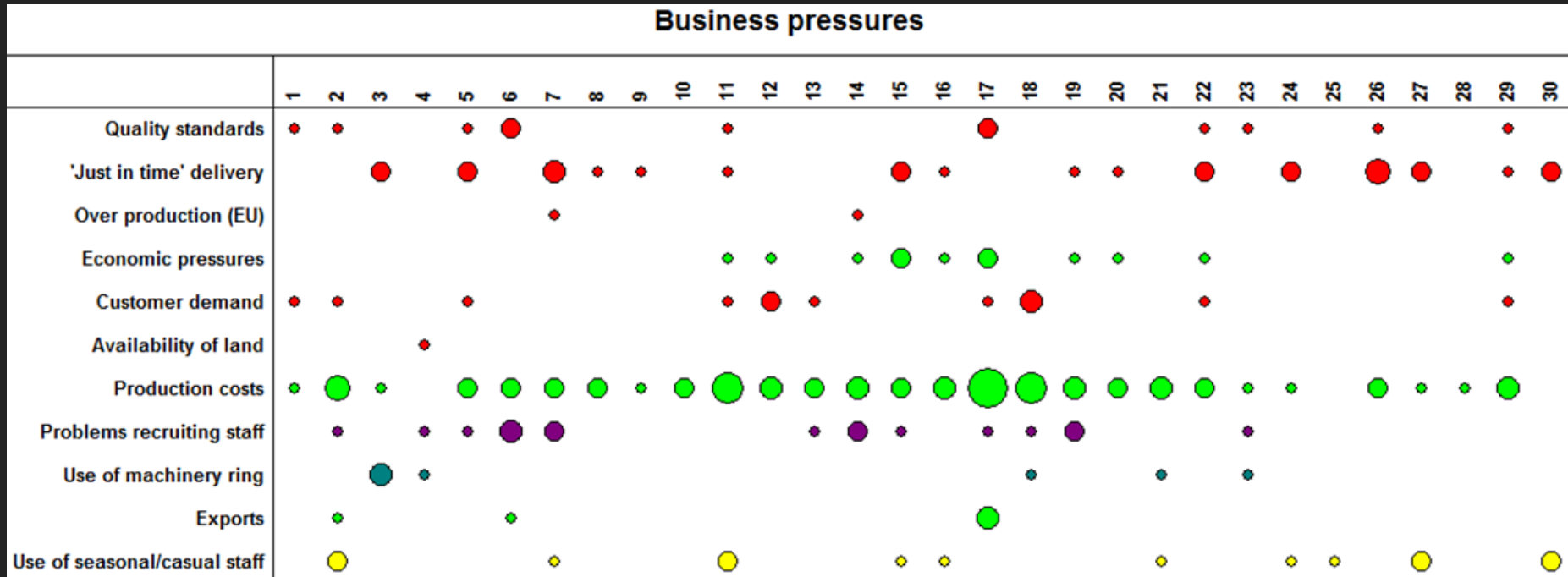
Methodology:

- One-to-one interviews based on a series of questions around social, financial and economic change

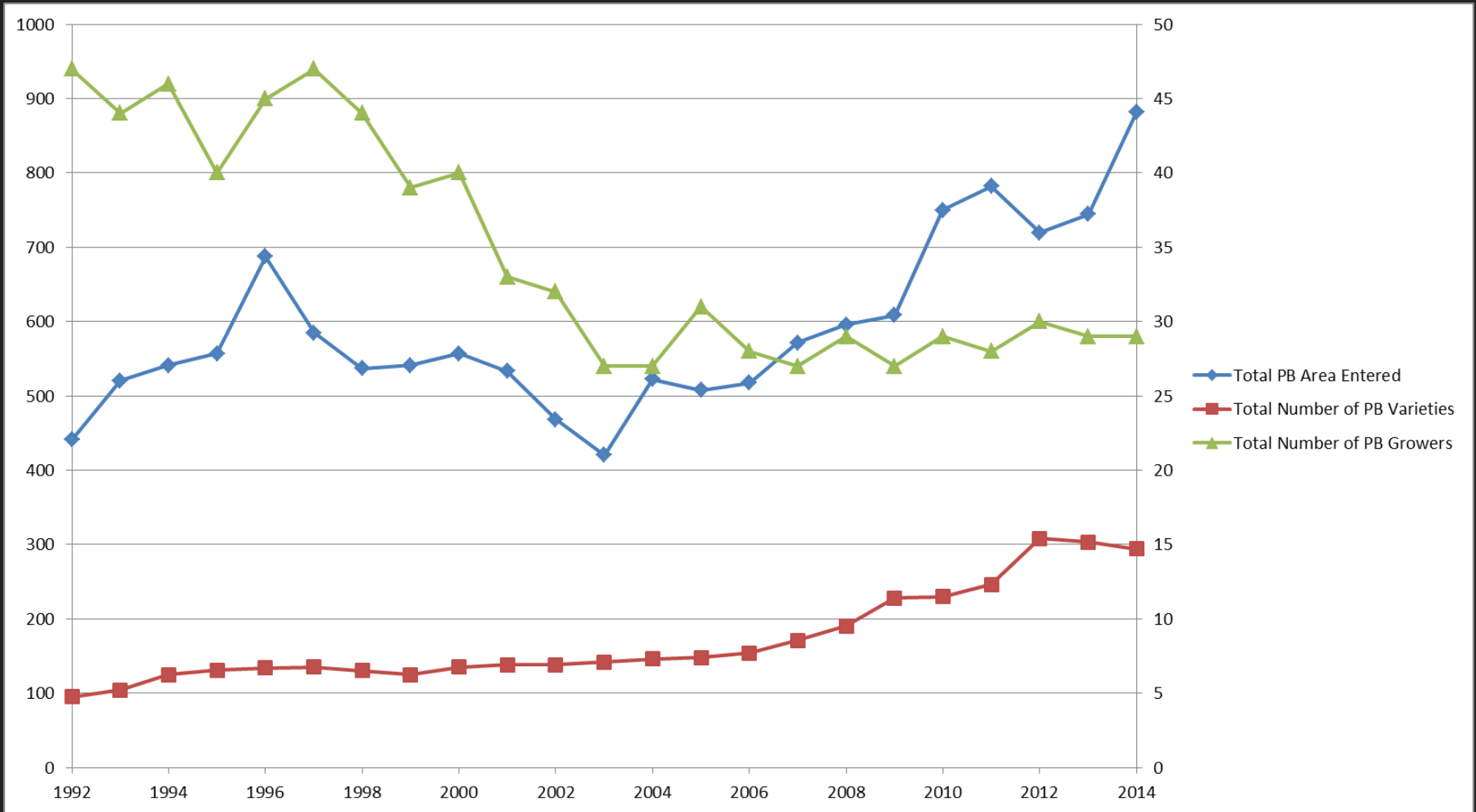
Analysis:

- In total 30 growers interviewed (28 from Scotland, 1 from Northern Ireland & 1 from England)
- QDA Miner qualitative data analysis software used to identify key themes

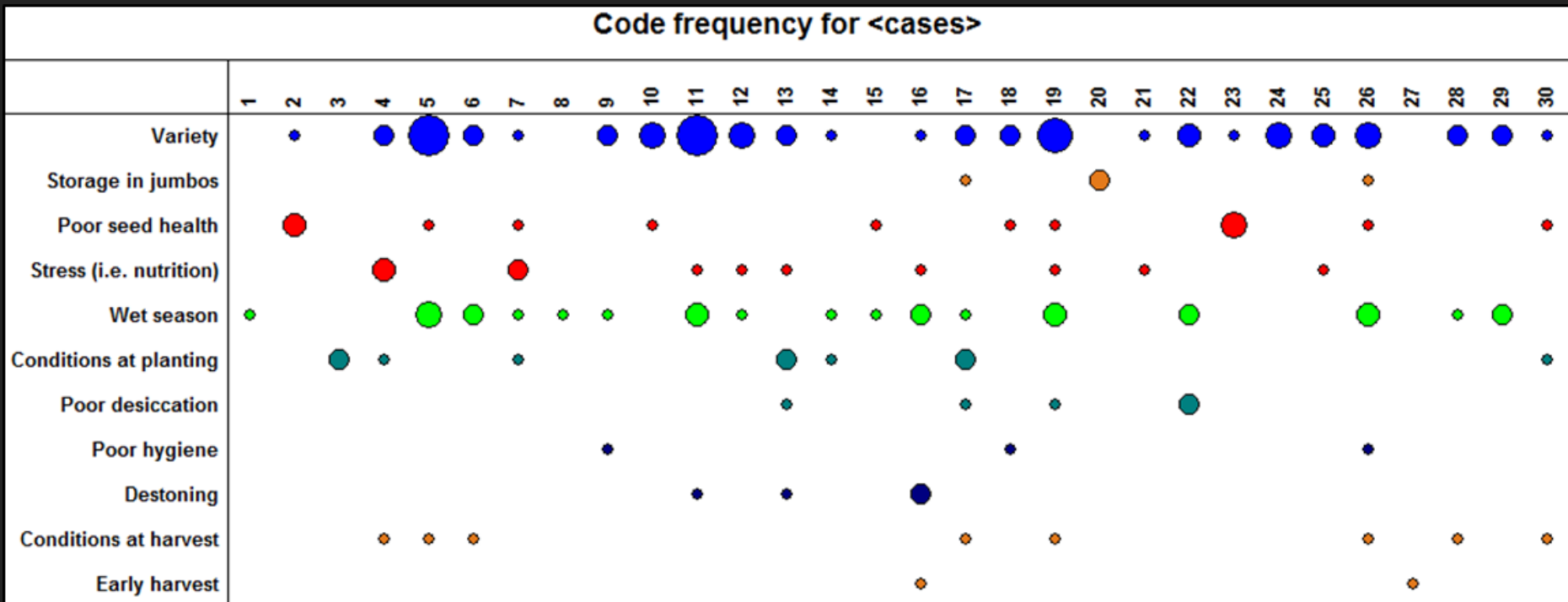
What are the main pressures on your business?



Changes to Scottish PB Production



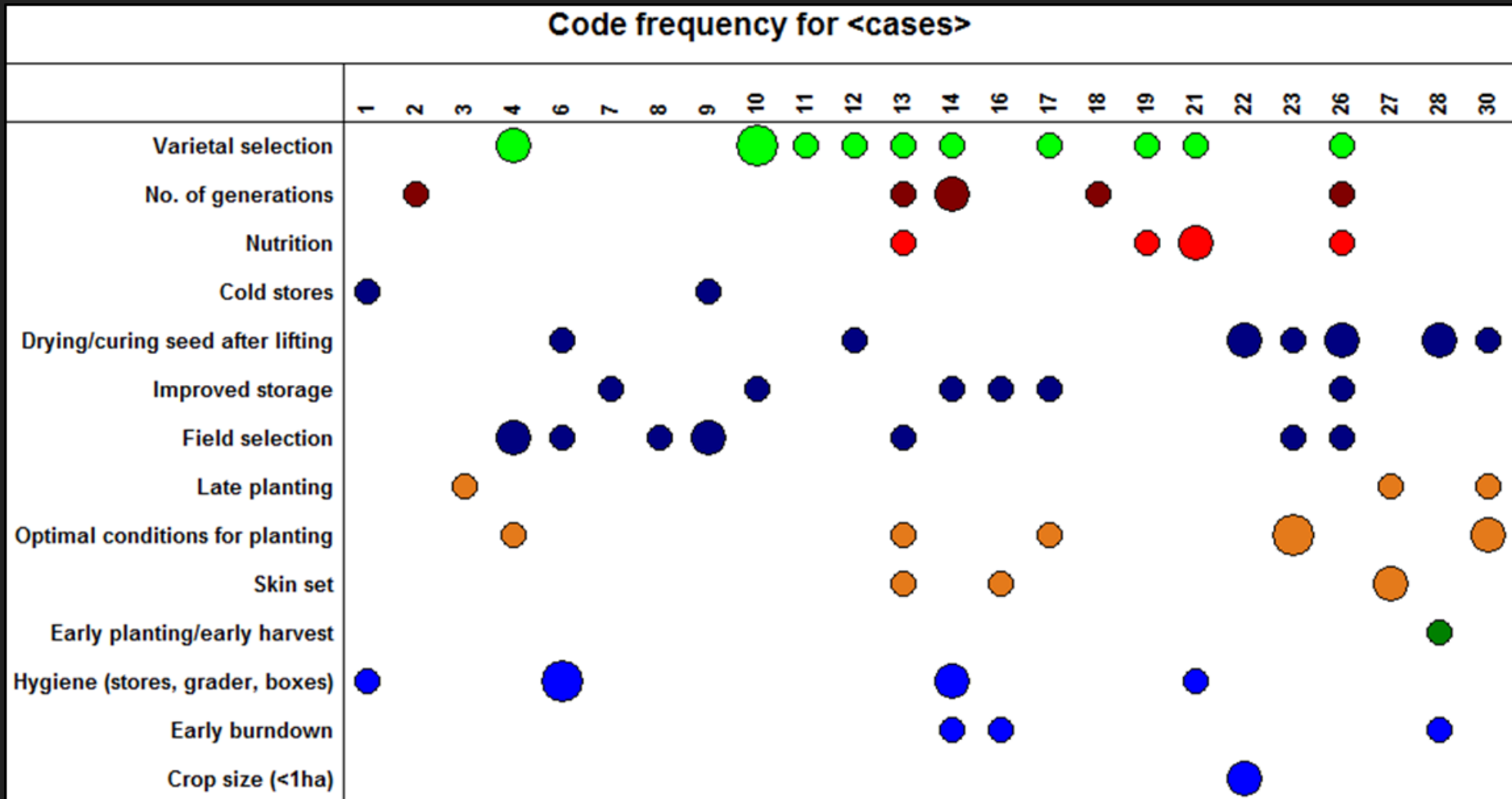
What are the main factors driving disease development in crops?



Ranking of varieties: blackleg by area

Rank	2015	2014	2013	2012	2011
1	Lionheart	Premiere	Swift	Charlotte	Charlotte
2	Premiere	Maris Bard	Fontane	Winston	Maris Bard
3	Charlotte	Winston	Premiere	Desiree	Estima
4	Sagitta	Slaney	Sylvana	Hermes	Winston
5	Winston	Cara	Charlotte	Estima	Valor
6	Slaney	Markies	Desiree	Cabaret	Desiree
7	Markies	Hermes	Hermes	Valor	Maris Peer
8	Maris Peer	Desiree	Estima	Cara	Cabaret
9	Hermes	Estima	Maris Peer	Maris Piper	Hermes
10	Desiree	Maris Piper	Maris Piper	Maris Peer	Maris Piper

What are the main factors that could be used to control or prevent blackleg from entering a crop?



Conclusions and next steps

- Factors affecting blackleg incidence and severity are numerous and complex!
- Clearly all businesses are under increased pressure: Could business size be an issue?
- In contrast to a widely held view there is no evidence to suggest that the recent increase is attributable to the current portfolio of varieties
- Although there is little consensus as to how we should improve blackleg management a number of avenues for further study have been identified
- Follow-up survey
 - Launch an online survey to all commercial growers based around key themes and issues (Aug 2016)
 - Final report with recommendations (Nov/Dec 2016)

Acknowledgments

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