

Low residue sprout inhibition in potatoes

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Research Project RESKIA (2015-2017)



Trial set-up

- 6 stores
- 4 boxes (750 kg/box) per store
- Ambient air ventilation + mechanical cooling
- Sprout control:
 - electrofog
 - restrain generator
- 7 varieties per box



Tested sprout suppressants

	Name	Active ingredient
1	Gro-Stop Electro	chloorpropham (636 g/l)
2	Biox-M	spearmint oil 100 %
3	Restrain	ethylene 96%
4	Bio-024	orange oil
5	1,4 Sight	1,4-dimethylnaphthalene (987,6 g/l)
6	SmartBlock	3-decen-2-one (784 g/l)



6,5 ° C

Applications: dose & timing

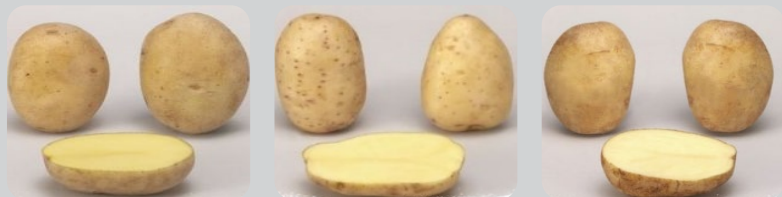
2016-2017

		Number of applications	Total dose (product per ton potatoes)
1	Bio-024	10	1000 ml
2	SmartBlock	3	300 ml
3	1,4Sight	5	100 ml
4	Restrainer	continuous	10 ppm
5	Biox-M	8	300 ml
6	Gro-Stop Electro	4	56,6 ml

	16 Nov	23 Nov	14 Dec	21 Dec	4 Jan	11 Jan	17 Jan	25 Jan	8 Feb	15 Feb	8 Mar	20 Mar	21 Mar	29 Mar	19 Apr	3 May	10 May	18 May	30 May	Total
1 Bio-024		100	100		100			100		100	100			100	100		100		100	1000
2 SmartBlock				100						100						100				300
3 1,4Sight	20		20							20			20				20			100
4 Restrainer	10																			10
5 Biox-M			90			30		30		30				30	30		30		30	300
6 Gro-Stop Electro	18,8					12,6					12,6					12,6				56,6

Varieties

Industry



Fontane

Markies

Innovator
(MH)

Fresh market



Charlotte

Nicola

Double



Bintje

MH = maleic-hydrazide

Assessments

Effectiveness

- **Sprouting**
 - 1 February
 - 15 March
 - 1 May
 - 15 June
- **Shelf-life** (fresh-market varieties)
 - Washing
 - Store 2 weeks @ 15°C
 - Sprouting +7d and +14d

Other parameters

- Fry colour
- Internal sprouting
- Silver scurf
- Black dot
- Cooking quality
- Weight loss

Sprouting – scale



Sprouting index (1-6)

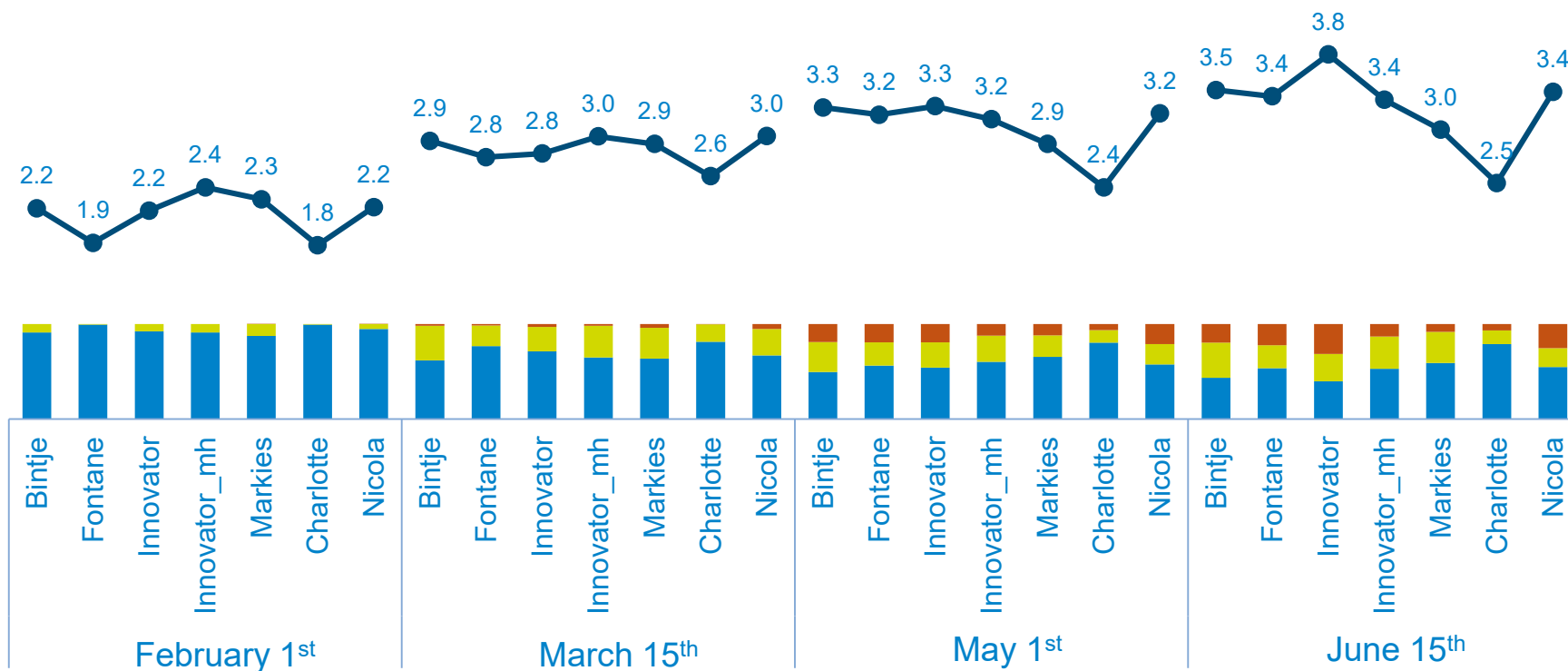
1. No sprouts
2. White point
3. Biggest sprout < 2 mm
4. Biggest sprout $2 - 5$ mm
5. Biggest sprout $5 - 10$ mm
6. Biggest sprout > 10 mm

Only biggest sprout assessed
(white and brown apart)

Sprouting index at unloading

■ Sprouts < 2mm (%)
 ■ Sprouts 2-5mm (%)
 ■ Sprouts > 5mm (%)
 ●— Sprouting index (1-6)

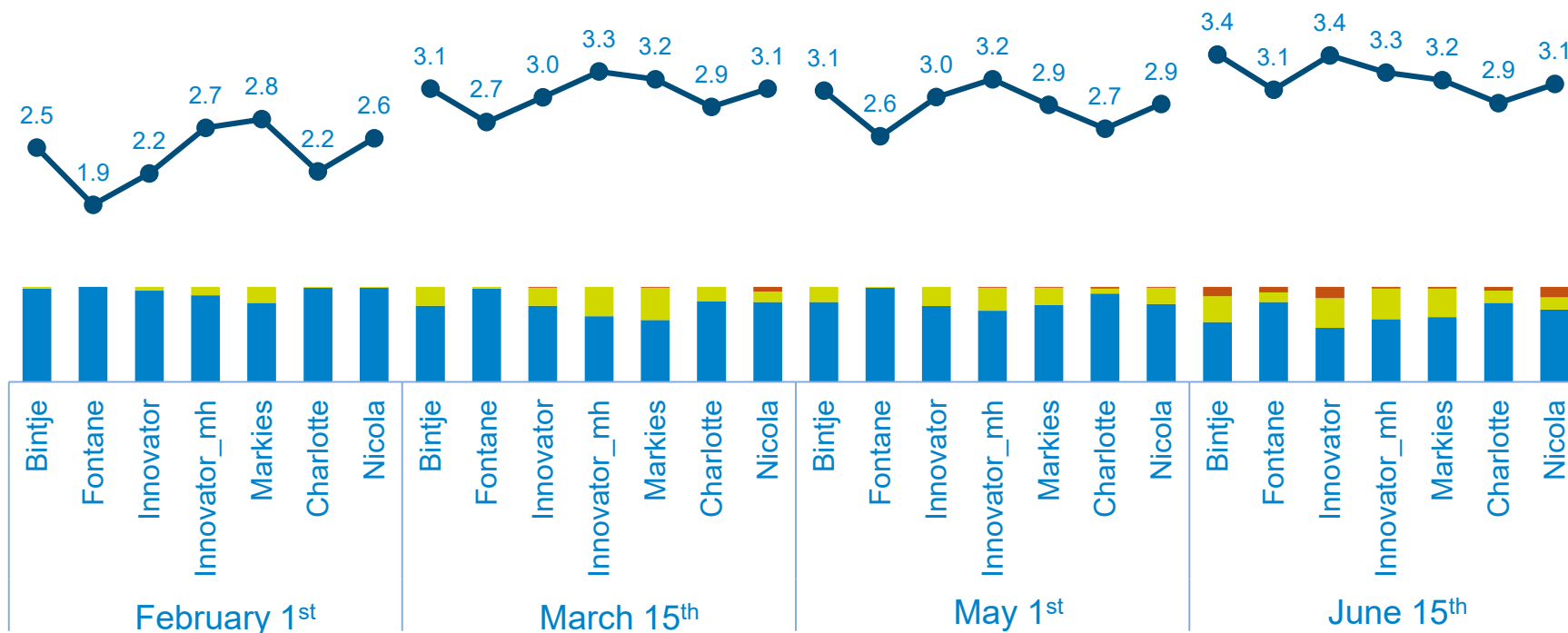
(All)



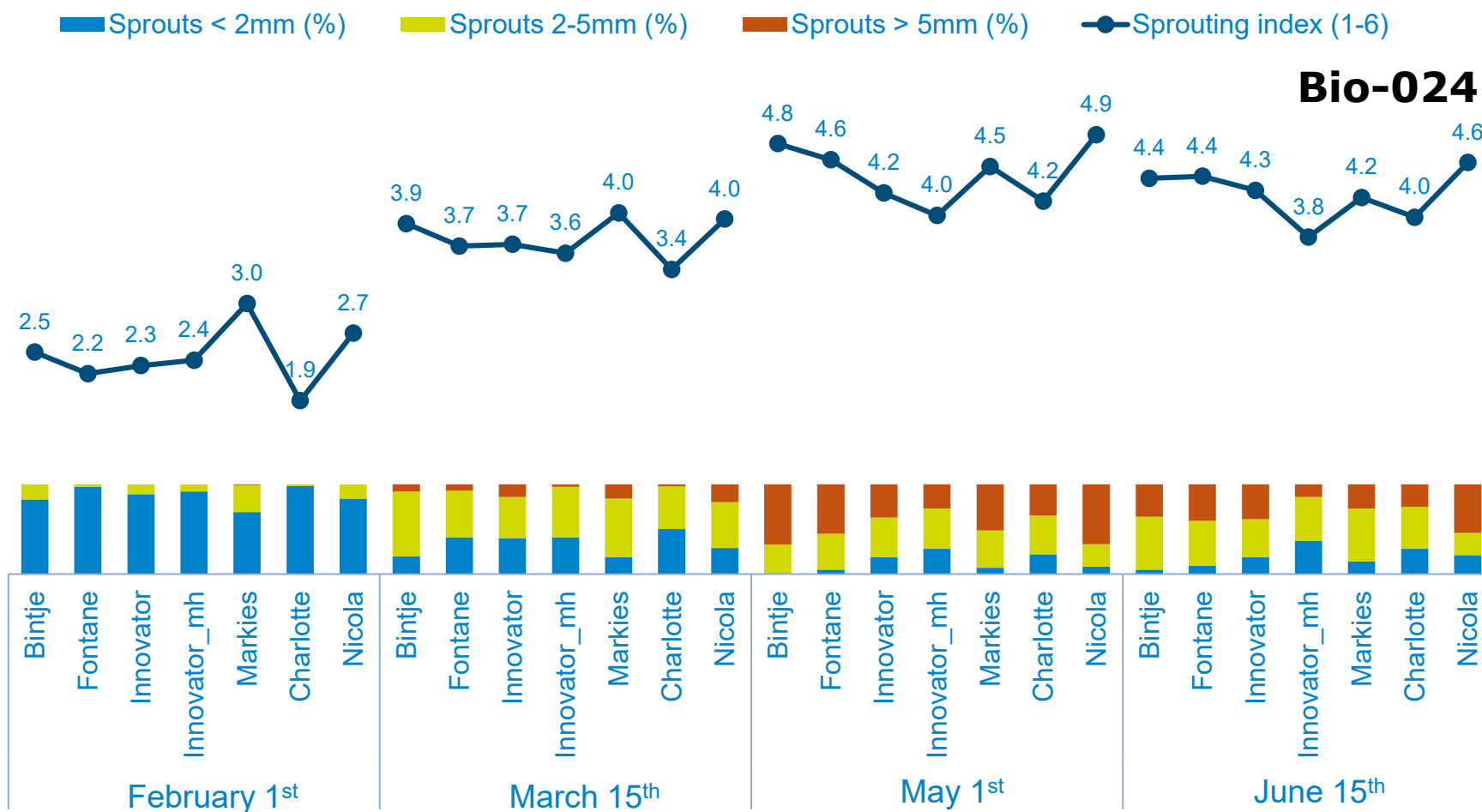
Sprouting index at unloading

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 ●— Sprouting index (1-6)

Gro-Stop



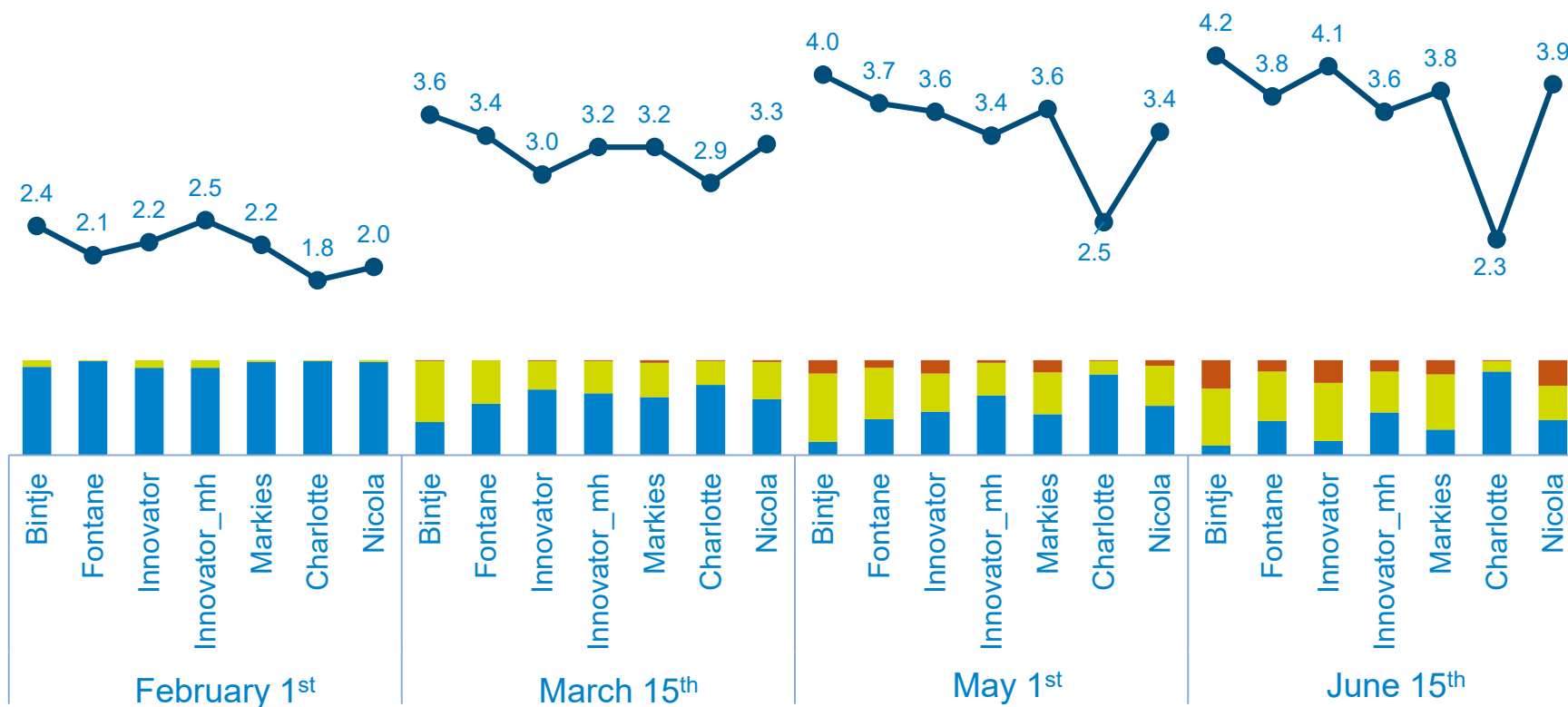
Sprouting index at unloading



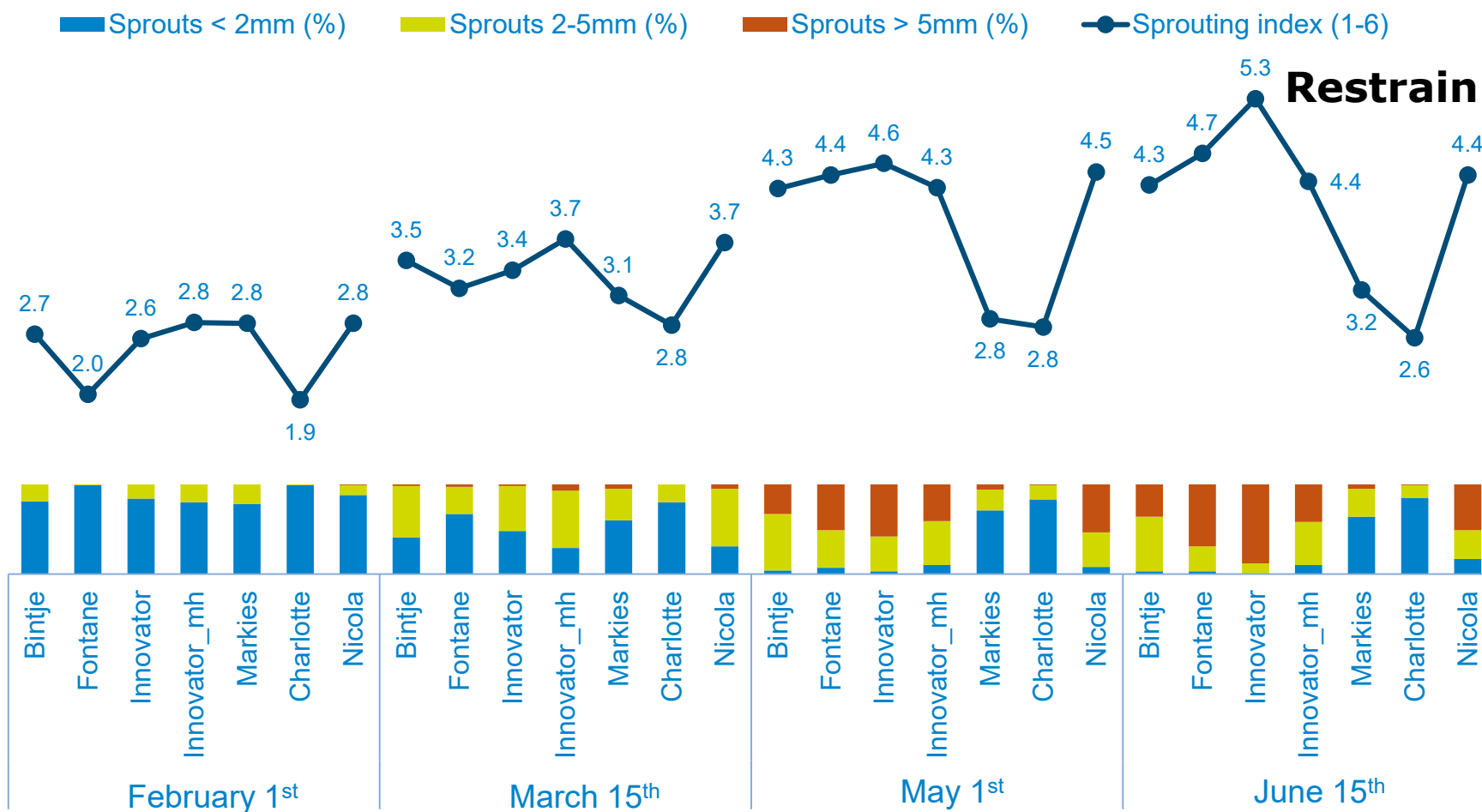
Sprouting index at unloading

■ Sprouts < 2mm (%)
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 ■ Sprouts > 5mm (%)
 ●— Sprouting index (1-6)

Biox-M



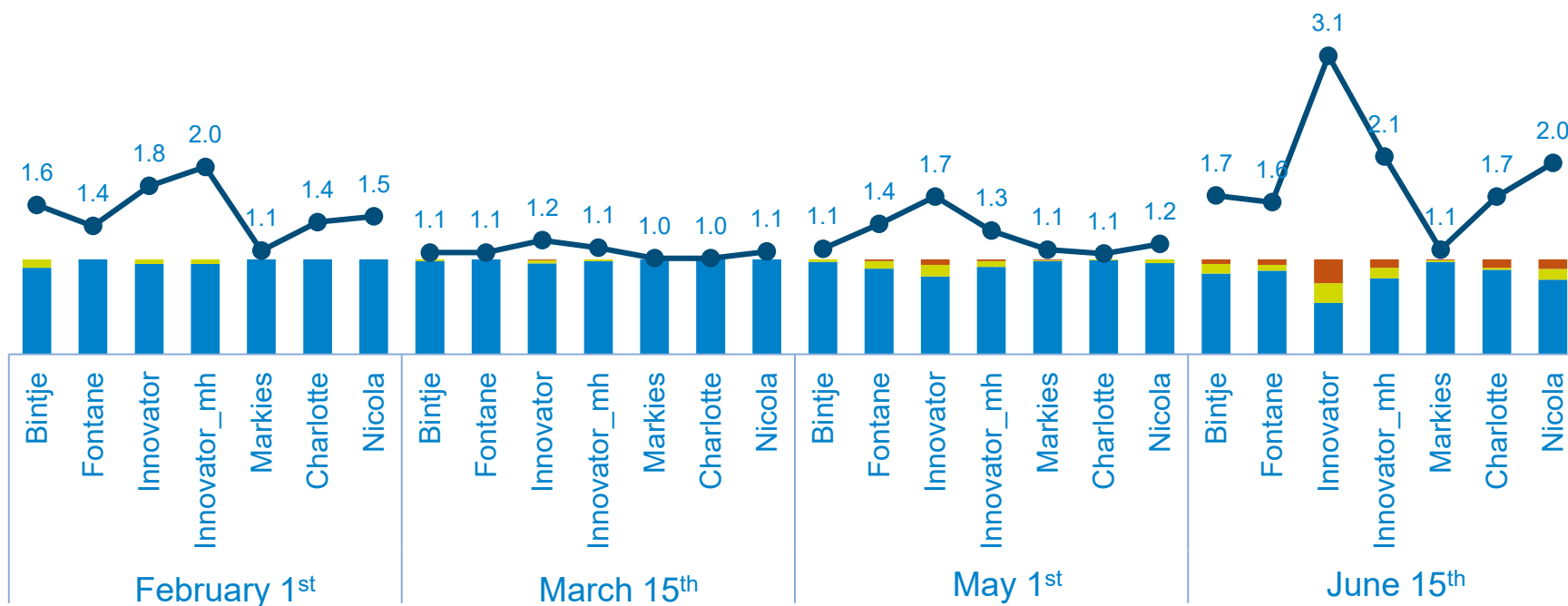
Sprouting index at unloading



Sprouting index at unloading

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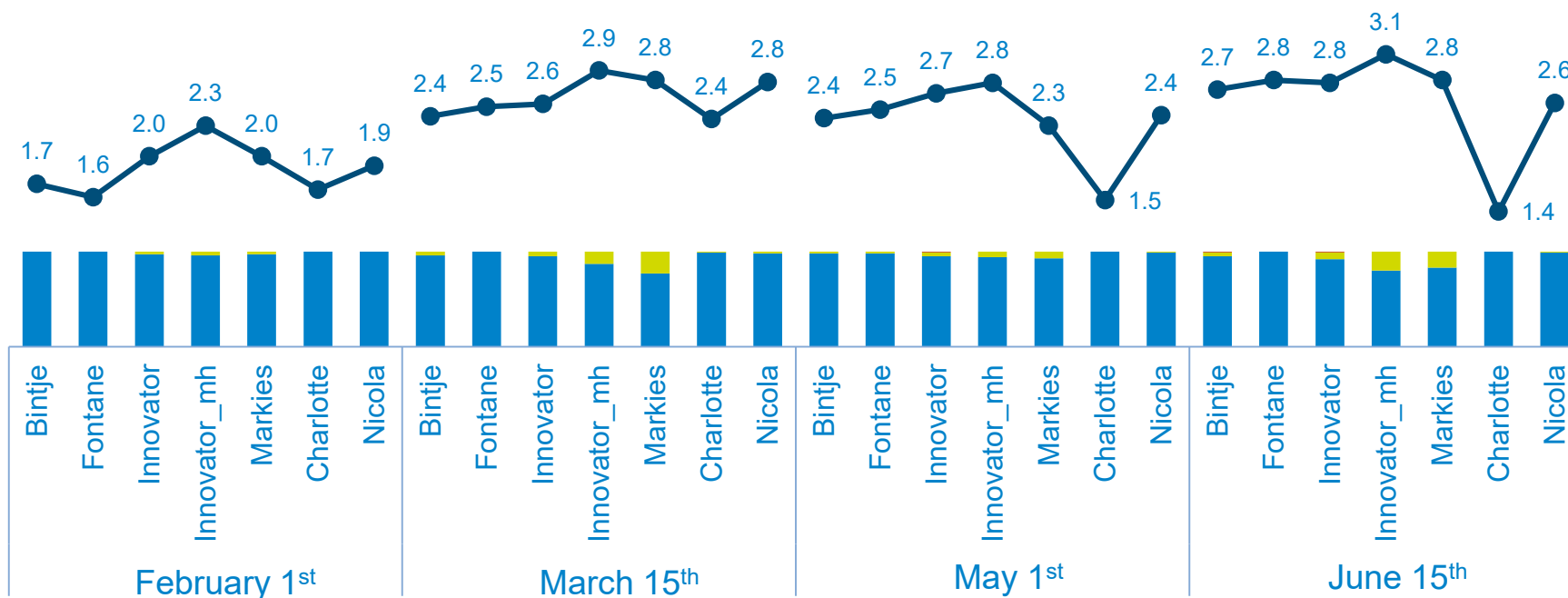
Smartblock



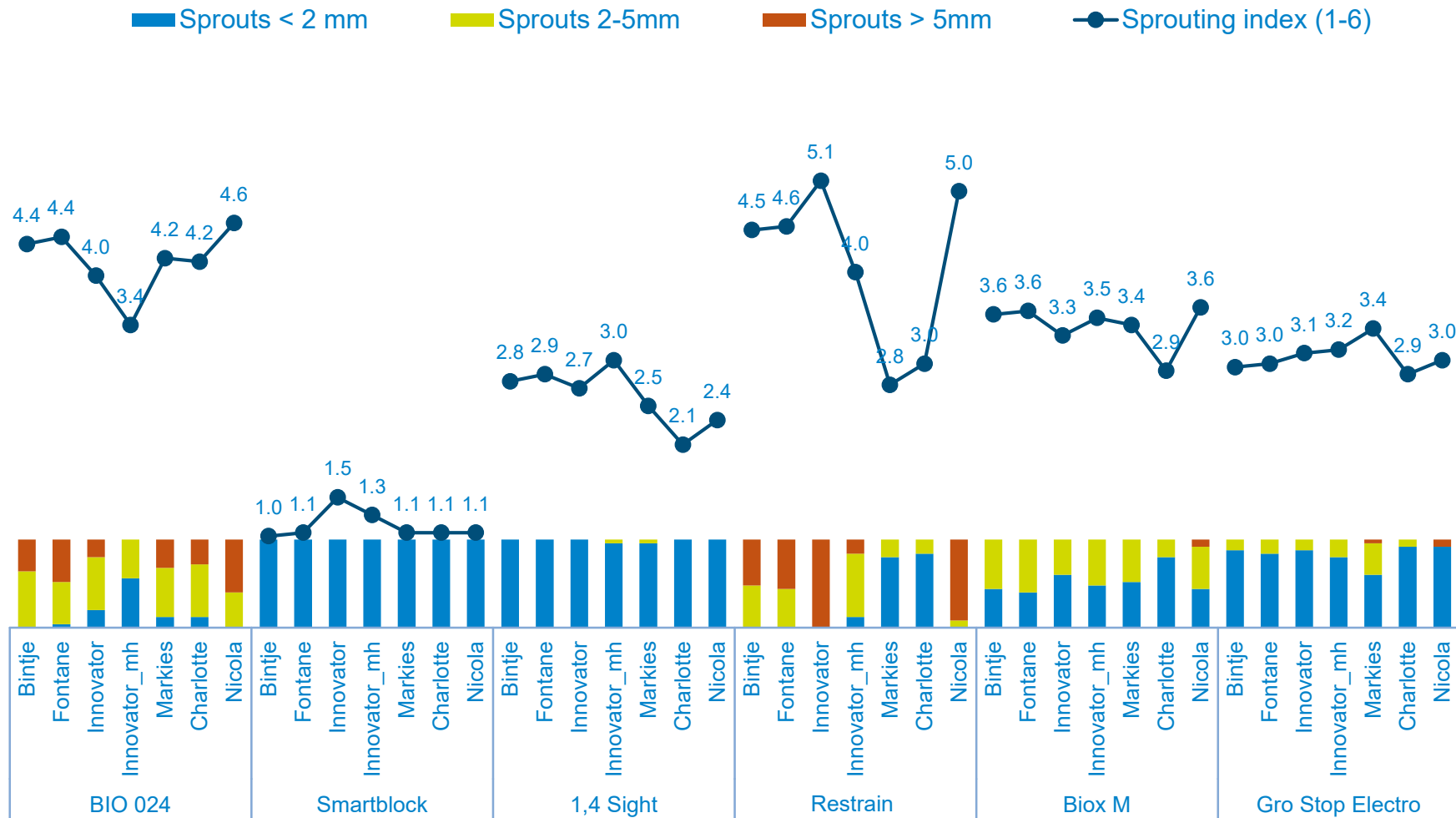
Sprouting index at unloading

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 ●— Sprouting index (1-6)

1,4 Sight



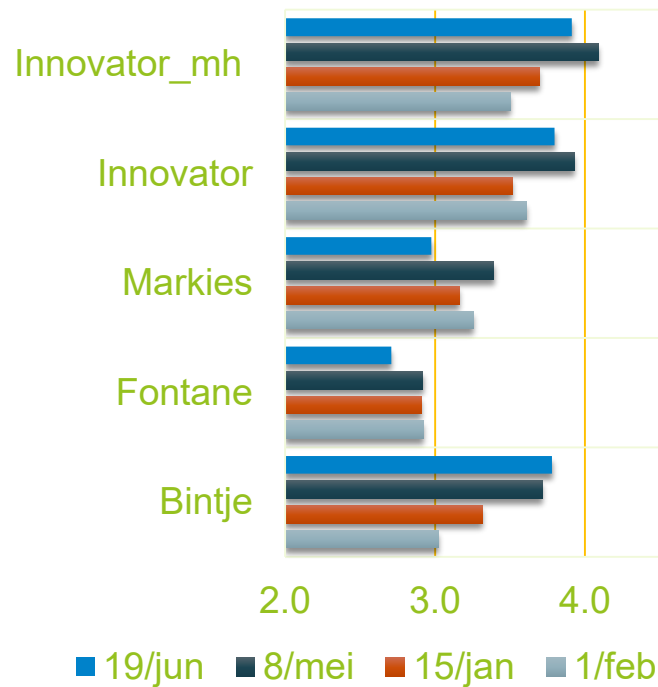
Comparison June 2017 (after 8 months storage)



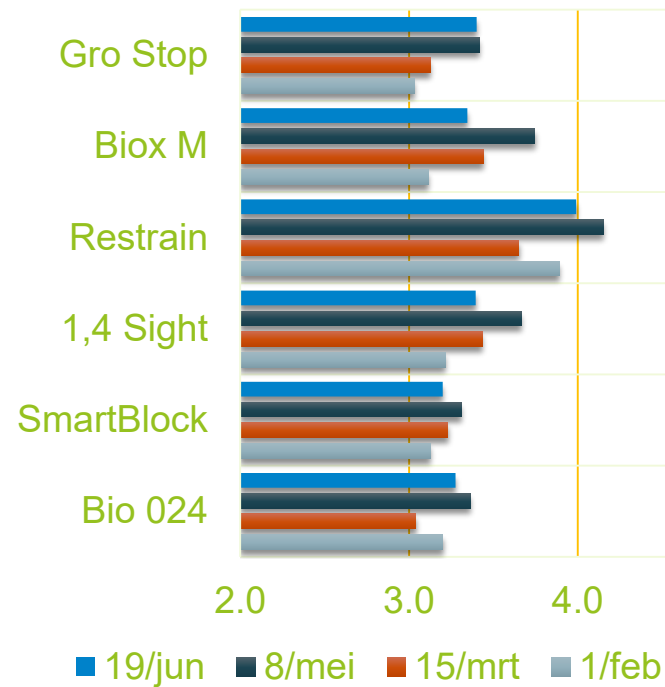
Fry colour (0-6)



Varieties



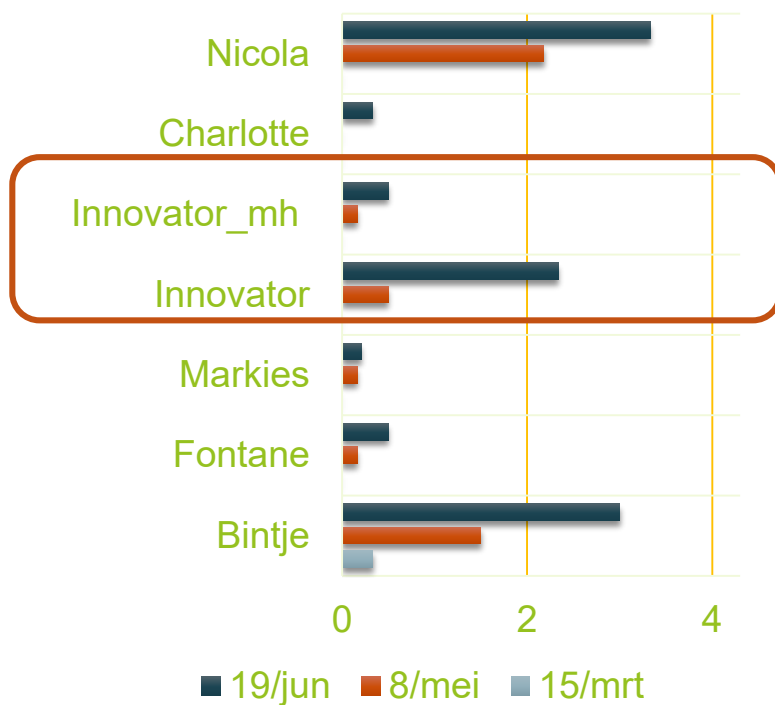
Products



Internal sprouting (% tubers)



Varieties

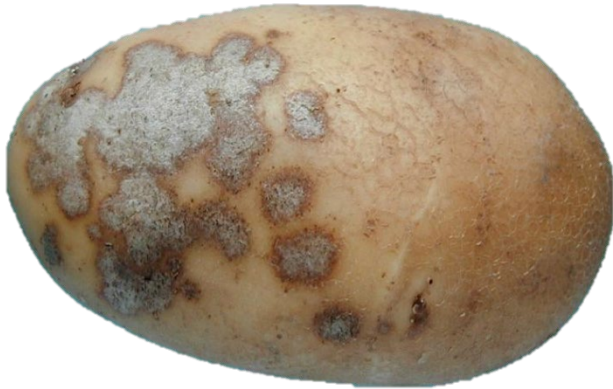


Products

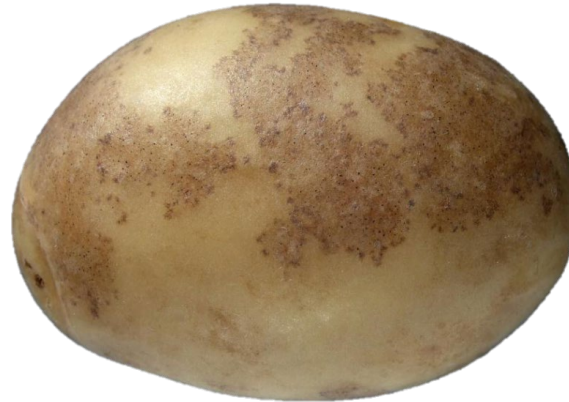


Skin diseases

Silver scurf



Black dot





Trial @ Thorembais (Pomuni)

1,4 Sight vs. CIPC

2016-2017

Trial outline

Location

- Wooden boxes
- 2 cels 900 tonnes
- Multiple varieties
 - Challenger
 - Noblesse
- Fogging

Assessments

- Sprouting before washing
- Shelflife at 10°C and 18°C
- Sprouting after 7, 14, 21 and 28 days



Fogging regime & residues

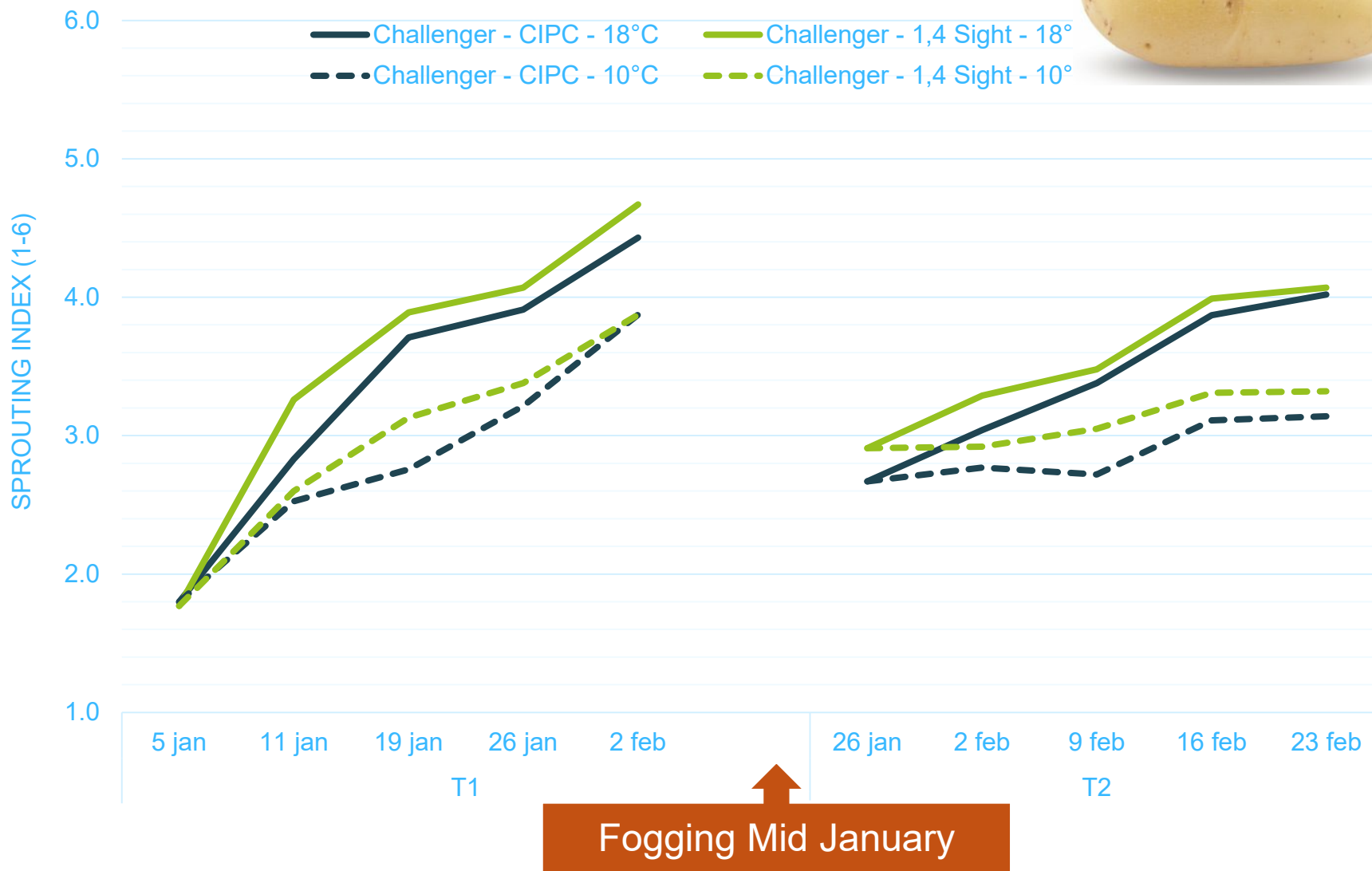
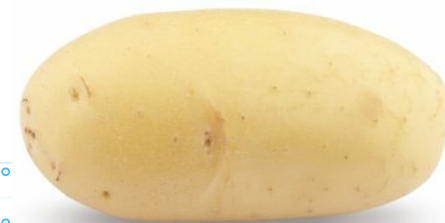
Date	Box A	Box B
14 Nov	Growstop Fog 300g/l	
22 Nov		1,4 Sight
10 Jan		1,4 Sight
16 Jan	Growstop Fog 300g/l	

Dose: 20 ml/ton

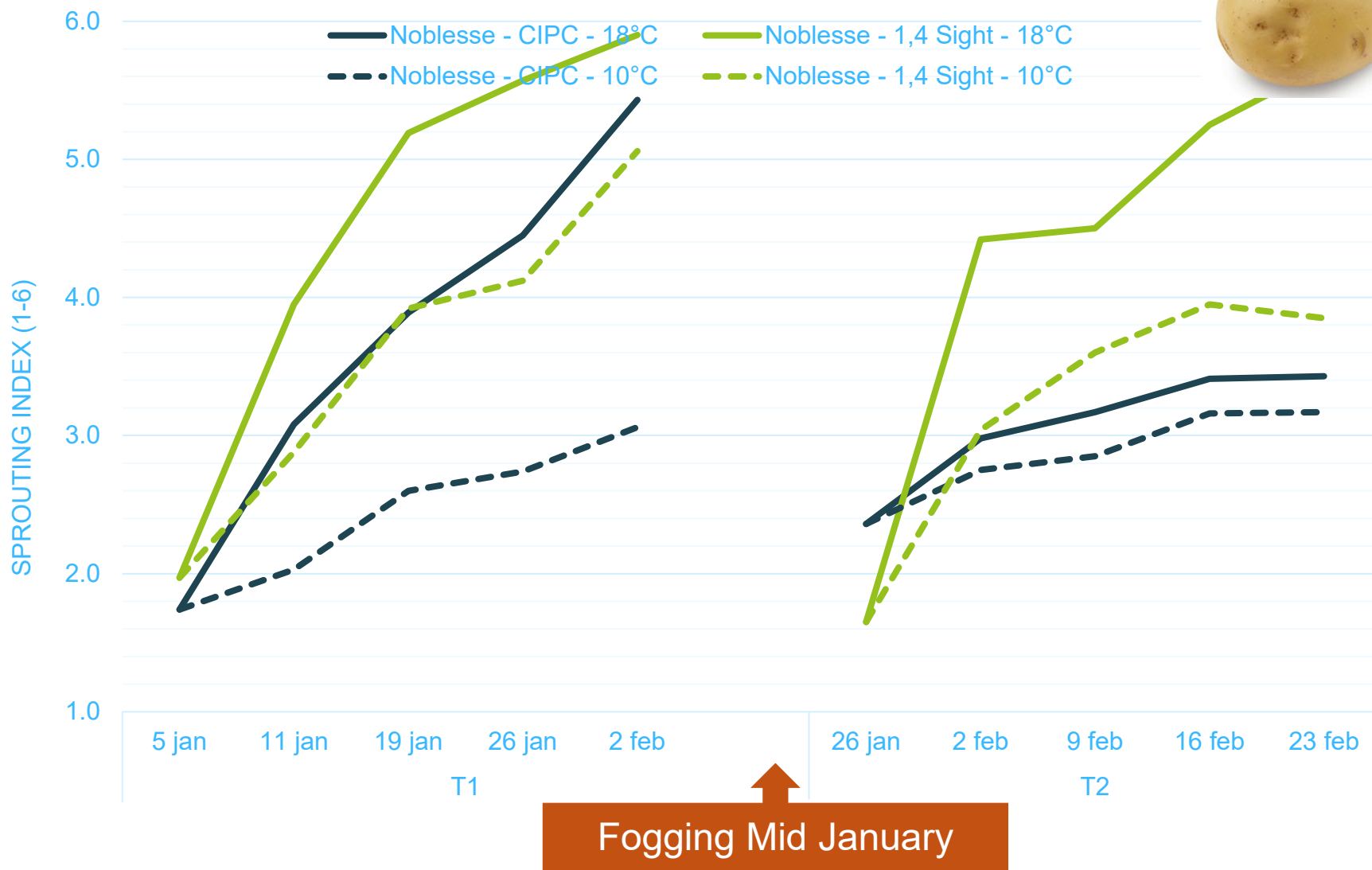
Residue CIPC	Challenger	Noblesse
4 Jan	0,13	3,20
25 Jan	0,65	5,90

Residue DMN	Washed	Peeled	Challenger
25 Jan	no	no	-
28 Jan (+ 3d)	yes	no	0,76
1 Feb (+ 7d)	yes	no	0,51
23 Feb (+ 28d)	yes	no	0,23
23 Feb (+ 28d)	yes	yes	0,04

Challenger - sprouting



Noblesse- sprouting



Conclusions

CIPC can be replaced for long term storage

Shelf-Life

- Alternatives work enough up to 7 days @ 15 °C without MH
- Effect of interval between treatment and unloading

Quality not influenced by product except...

- Internal germination (suppressant vs. inhibitor)
- Fry colour (depending on variety x product)

Acknowledgments

Partners



FLANDERS'
FOOD



RESEARCH & ADVICE IN AGRICULTURE & HORTICULTURE



PCA

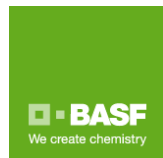
Funding



belgapom



Arysta
LifeScience



BASF
We create chemistry

