

Storage

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Sprout suppression

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Sprout control

How can sprouting be controlled?

Chemical control

Physical controls

store temperature

dormancy

Physical sprout control

Reducing temperature

- extends dormancy
- restricts sprout growth

but

- increases sugar content (and acrylamide risk)

Chemical sprout control (in the EU)

Two levels of control



- The active substance is assessed for the EC by a RMS
- **End Points** are derived. An **MRL** may be set
- Approvals cannot be for more than 10 years



- Formulations are regulated by national authorities
- Product labels ensure **End Points** are met
- Other countries may have different usage patterns

Maleic hydrazide (MH)

Formulations include **Crown MH, Fazor, Itcan**

Pros

Very effective alone or as a foundation for other s/s
Now widely accepted

Cons

Application conditions can be restrictive (2018)
Feeding restriction now applies¹

¹new MH labels exclude treated crop from stockfeed

Chlorpropham (CIPC)

Formulations include **Aceto 50M, CIPC Gold, GroStop**

Pros

Most effective s/s

Cons

Toxicology of metabolites. EC has recommended CIPC is not renewed.

Chlorpropham (CIPC)

Outlook

EC recommends non-renewal but (so far) have failed to obtain qualified majority.

Non-renewal would be followed by a 'use up' period

If it is retained, label rates and MRL will change

Spearmint oil

One product, **BIOX-M**

Pros

No MRL

Widely accepted in fresh market

Cons

Modest efficacy

Store fabric exclusion

Cost

Ethylene

Products include **Restrain** and **Safestore (biofresh)**

Pros

No MRL

Widely accepted in fresh market

Cons

‘Temporary’ & modest efficacy

What might be available?

<i>active</i>	2018	2019	2020	2021
MH	✓	?	?	?
CIPC	✓	?	?	?
Spearmint¹	✓	✓	✓	✓
Ethylene	✓	✓	✓	✓
DMN²	✗	?	?	?
Orange³	✗	?	?	?
SB⁴	✗	✗	?	?

¹ Spearmint oil/BIOX-M

² 1,4-dimethylnaphthalene/1,4SIGHT

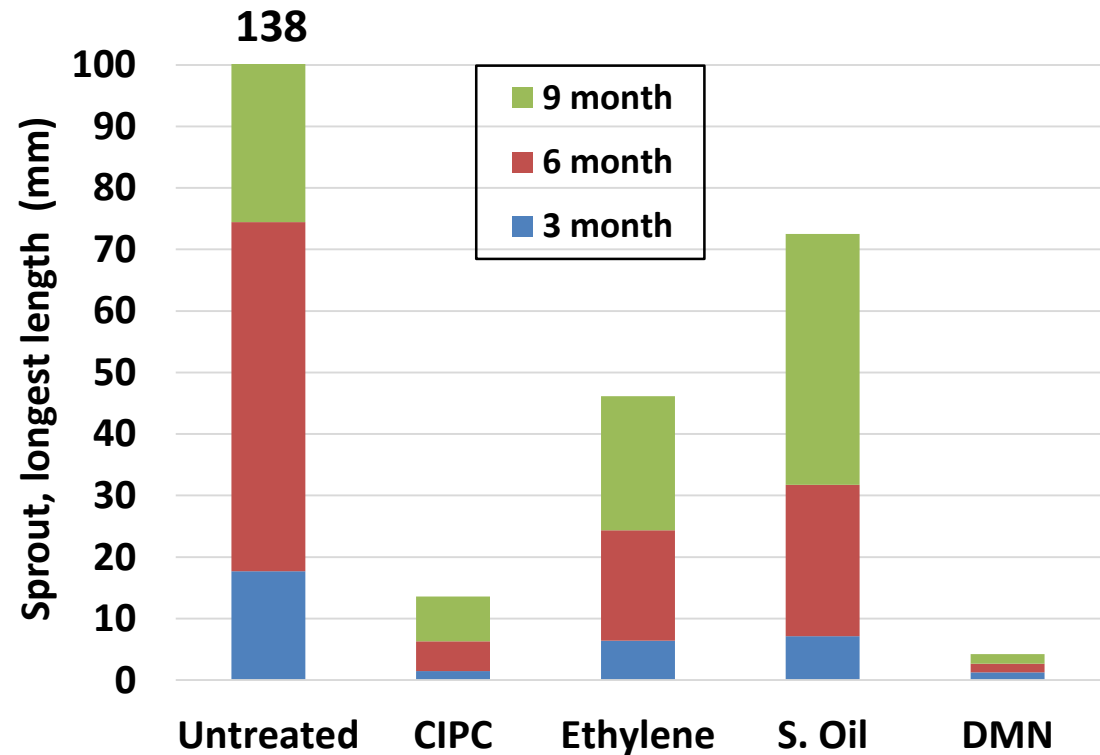
³ Orange oil, Argos

⁴ 3-decen-2-one/SmartBlock

2017-18 research on alternatives

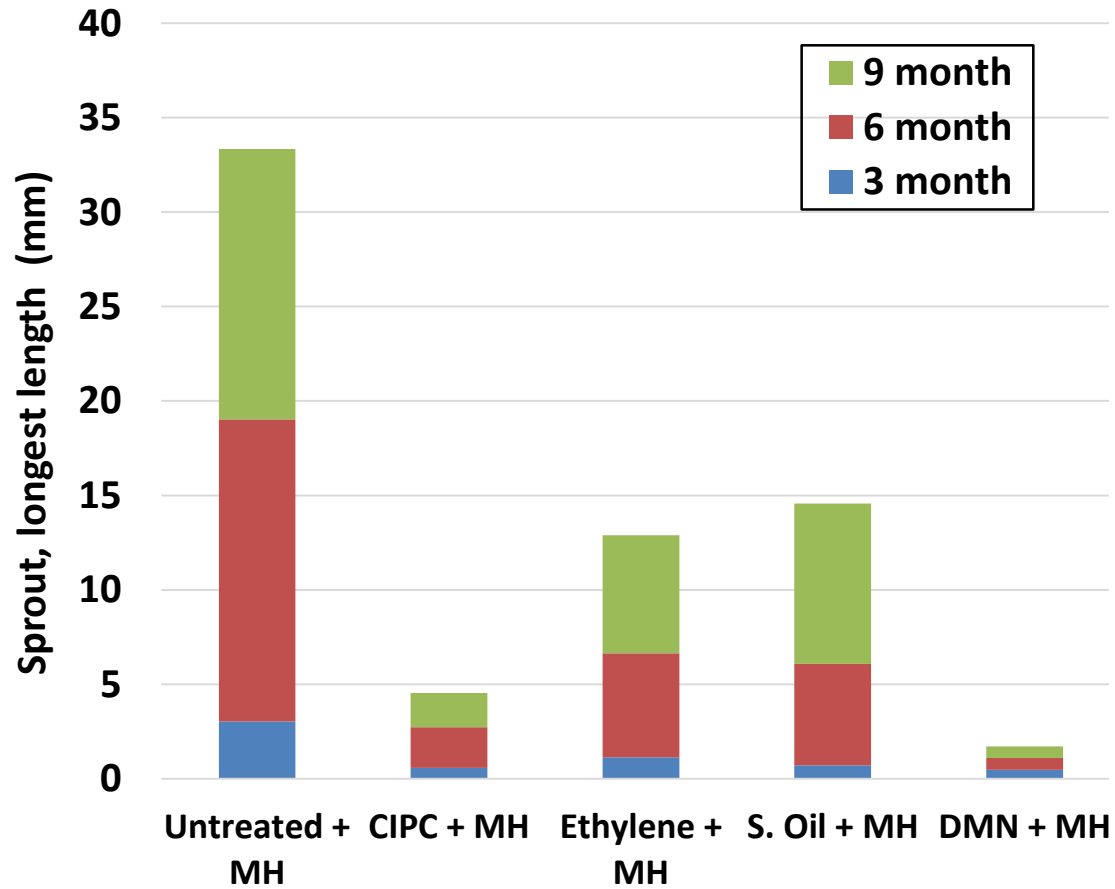
- five cultivars, short - long dormancy
 - Innovator, M Piper, Performer, Royal, VR808
- + and – MH were different crops
- 9°C storage temperature
- sprouting assessed after 3, 6 and 9 months

Sprout length, mean all cultivars, no MH



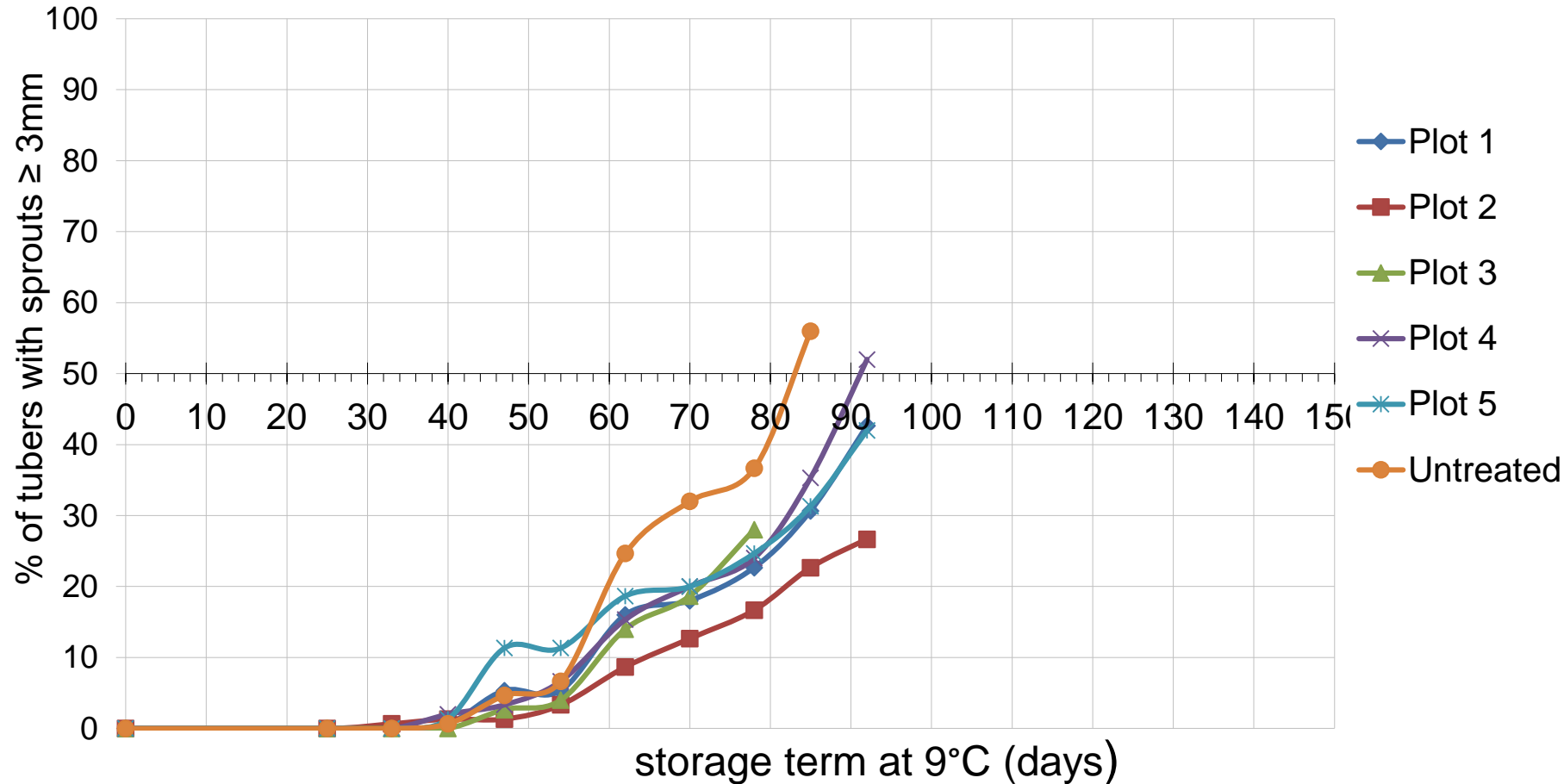
Without MH, sprout length only well controlled using CIPC and DMN

Sprout length, mean all cultivars, with MH



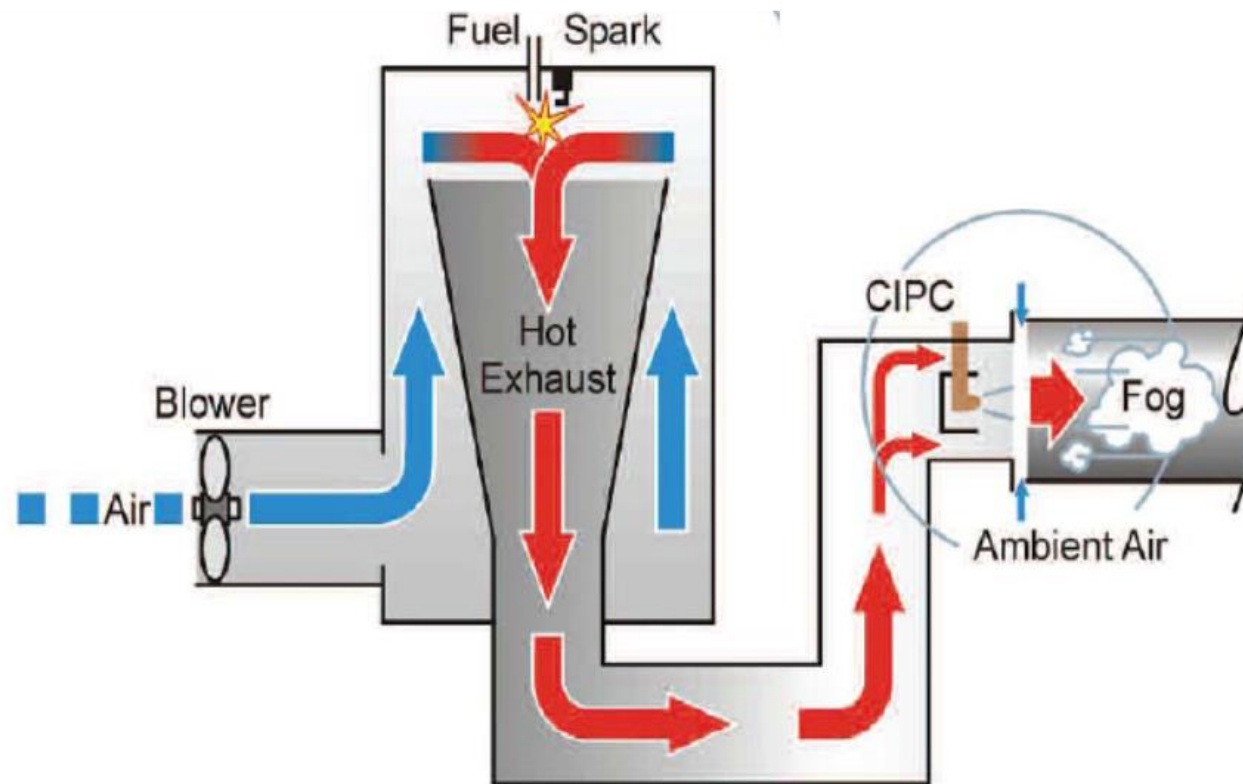
With MH, control generally much better, but for long term storage without CIPC or DMN sprouting was only well controlled using long dormant cultivars

MH plots from SPot North in store at SB



**Standard
application of
maleic
hydrazide at 5
timings to cv
Royal at SPot
North**

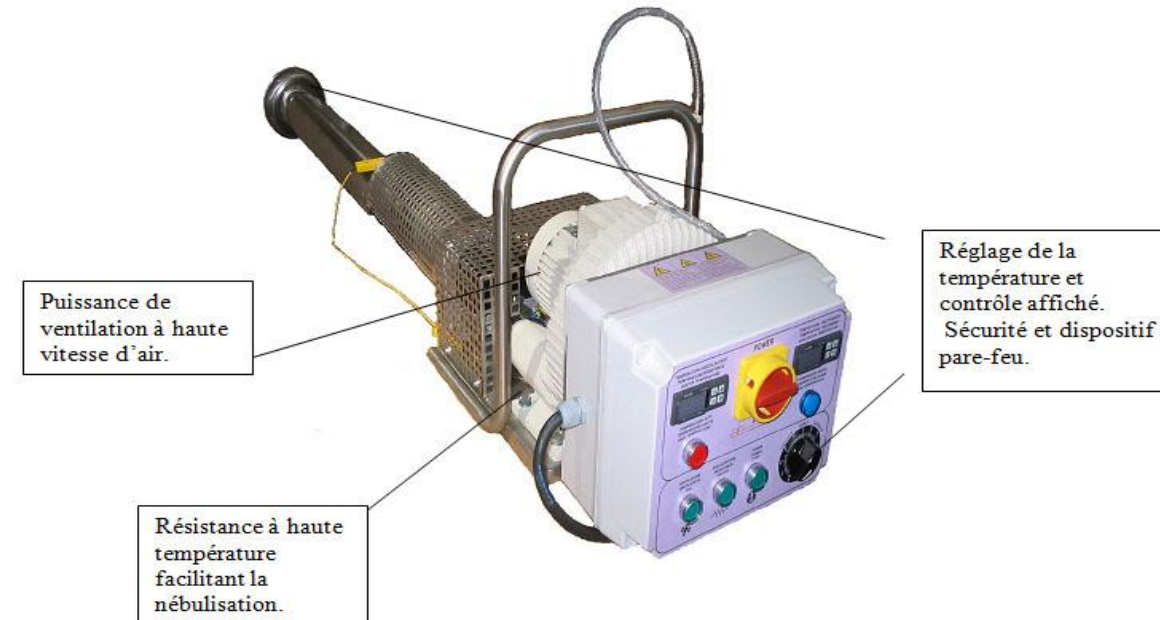
Application technology



Application technology

Except CIPC and ethylene, new post-harvest treatments are volatile....

- store closure period will be longer (minimum 24 hours)
- losses will be greater, especially from ambient ventilation
- may require change in technology for processing crops



AHDB research 2018-2021

Alternative sprout suppressants

- processing
- fresh pack (+orange oil, K. Edward, M Piper, Melody & Nectar)

Dormancy

- independent dormancy data (30 current and new cultivars)

Maleic hydrazide

- quantifying benefits & dose-response

CIPC contamination

- data to support a temporary MRL

Storage workshops this spring

- 15 Jan: Storage North (Yorkshire)
- 24 Jan: Storage West (Shropshire)
- 12 Feb: Roadshow East (Cambs/Essex)
- 13 Feb: Roadshow South Lincolnshire
- 26 Feb: Roadshow Norfolk
- 5 March: Storage East Midlands
- 6 March: Roadshow Cheshire
- 7 March: Roadshow North Yorkshire