Research update

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Hort Innovation
Strategic levy investment

PISTACHIO FUND

Introduction

- Thematic areas :

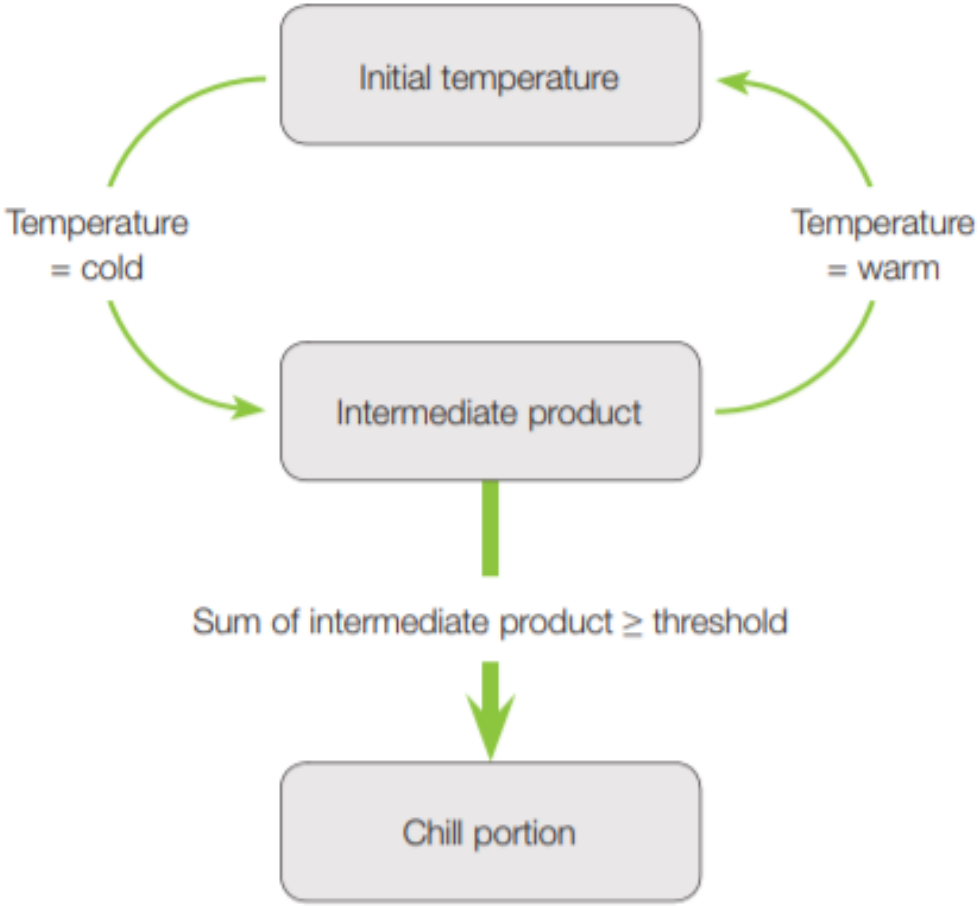
  - Chill
  - Blanks
  - Fungicide efficacy
  - Alternate varities

Chill

- The fulfilment of chilling requirement - 59 chill portions and the required number of growing degree hours (GDH) - 9633 at above 4.4°C for 50% bloom (Zhang and Taylor 2011).

- Physiologically, Dynamic model, two steps process describes accumulation of winter chill.

Accumulation of winter chill

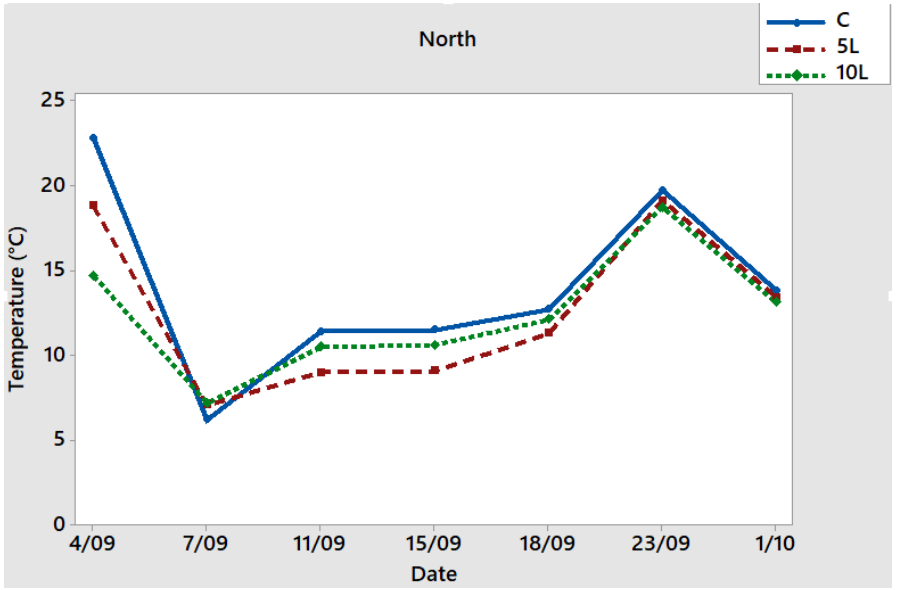


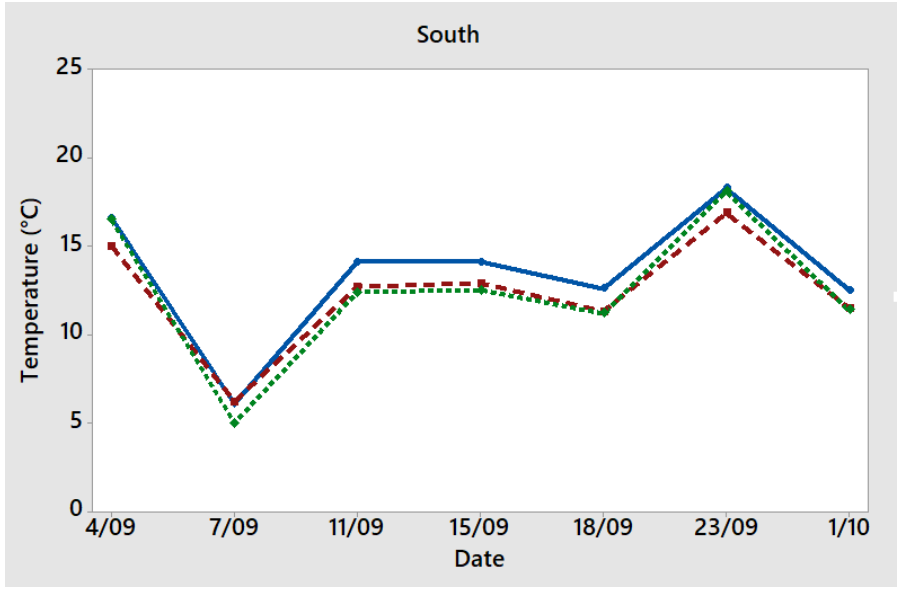
Darbyshire et al. (2011)

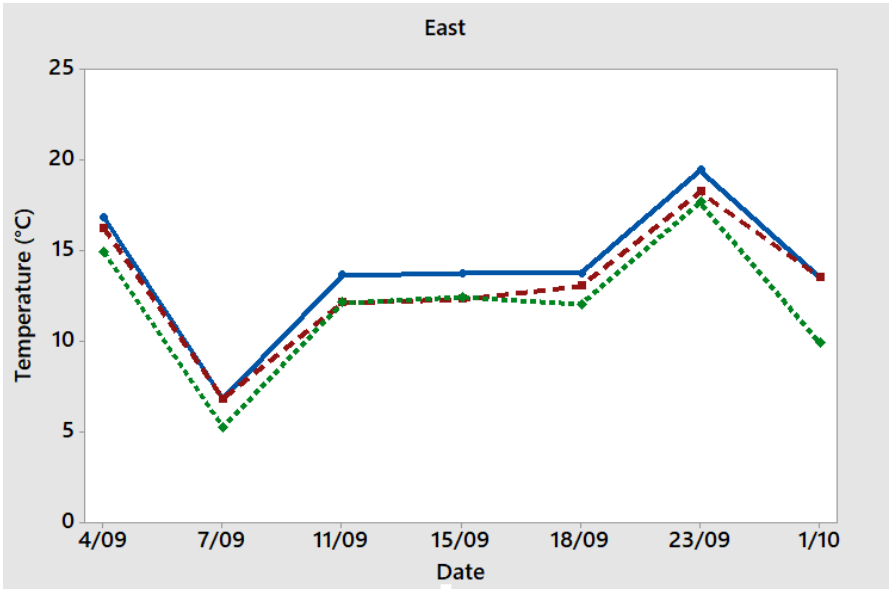
Polymer application

- Started the trial in 2018/19 and preliminary data has been processed.
- Treatments – 5L & 10L.
- Trial will be continued.

  - Bud temperature
  - Phenology monitoring
  - Growth model


North
C
5L
10L
Temperature (°C)
25
20
15
10
5
0
4/09
7/09
11/09
15/09
18/09
23/09
1/10
Date


South
Temperature (°C)
25
20
15
10
5
0
4/09
7/09
11/09
15/09
18/09
23/09
1/10
Date


East
Temperature (°C)
25
20
15
10
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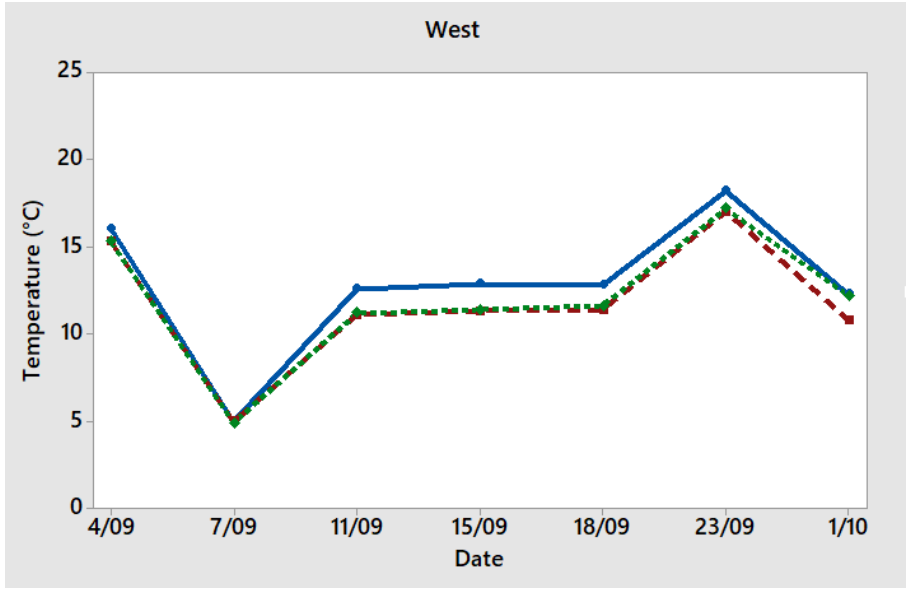
0
4/09
7/09
11/09
15/09
18/09
23/09
1/10
Date


West
Temperature (°C)
25
20
15
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0
4/09
7/09
11/09
15/09
18/09
23/09
1/10
Date

Phenology observation

Date	Control	5L	10L
4/09/2018	Dormant bud	Dormant bud	Dormant bud
7/09/2018	Dormant bud	Dormant bud	Dormant bud
11/09/2018	Bud swell (Bit later)	Bud swell (Advanced)	Bud swell (Advanced)
15/09/2018	Bud swell (Bit later)	Bud swell (Advanced)	Bud swell (Advanced)
18/09/2018	Woolly bud	Early green tip 1%	Early green tip 1%
23/09/2018	Woolly bud	Green tip (Advanced)	Green tip (Advanced)
1/10/2018		Bud advanced (Pronounced female flowers)	

General comments

- No phytotoxicity.
- Late flowering dominated - NE and E side of 5L and 10L treated trees in mid November.
- Late bud break (Noticeable on the E side) & late flowering - all over the trees of control in mid November .

Evaporative cooling

- Method of reducing bud temperature during warm winter.
- Cooling will be applied - > 10°C day time temperature (Erez and Couvillon 1983).
- Reduce bud temperature under warmer winter conditions thereby increase the number of chill hours that the bud experience.
- Reduced average weekly maximum temperature by 4.3°C in Peach (Cornelius 2008).

Blank nuts

- Increasing nutrient absorption, stimulating mobility of nutrient (phloem immobile) and physiological functions of the plant can enhances resources and reserves.

- Complex Polymeric Polyhydroxy Acids (CPPA).

- Technology has been tested in UC, Davis.

Zn deficiency

- This technology will be used to absorb more Zn by plants.

- Increase the penetration of cuticles, trans laminar movement into the leaf and facilitate movement in the phloem.

Efficacy of fungicides

Trade name	Active ingredient	Mode of action	Chemical group (FRAC)
Dithane	Mancozeb	Contact	M3
Captan	Captan	Contact	M3
Copper fungicides	Copper	Contact	M1
Bravo	Chlorothalonil	Contact	M5
Switch	Fludioxonil/ Cyprodinil	Contact + Systemic	12/9
Pristine	Pyraclostrobin/Boscalid	Systemic	7/11
Octave	Prochloraz	Systemic	3
Rovral	Iprodione	Systemic	2

Research questions

- How are trees receptive to absorb the systemic fungicides?
- Do Juvenile or mature trees (waxy and hardened) effectively absorb?
- What is/are the most effective time/s for fungicide application?

Methodology

- Receptivity of trees for fungicides.
  - Radioactive substances will be used.

- Assessing absorption of fungicide mechanism with the age of tree.
  - Different age group will be used.

- Timing trial
  - Incidents and extent of damage.

Alternative varieties

- Kerman

  - Young plants performed badly.

  - Fertilizer recommendation in Australian context.

Suggestions

- To increase quality of nuts by pollination.
- Efficiency of male plants.

Thank you

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