



Strawberry Nursery Production: Alternatives and Results from trials in Different Geographic Regions

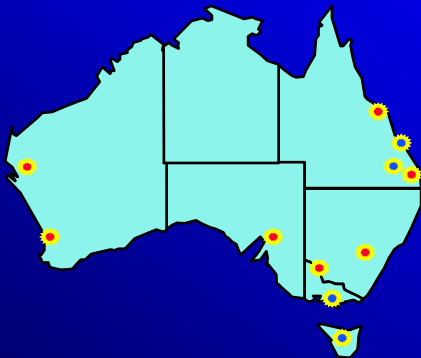
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Dept of Primary Industries

Content

- **Importance of soil disinfestation**
- **MB Results from Trials in Different Regions**
- **Remaining issues globally**



Methyl Bromide Fumigation: Strawberry Runner Industry



Methyl Bromide biggest chemical in agriculture by amount

Issues



**Methyl Bromide
50:50**



Untreated

Application Issues: Improvements being made!



**Cyanogen?
Methyl iodide/Pic - hot gas**



Telone/Pic and Pic EC???



Telone/Pic broadcast



Metham

What can be Used to Replace Methyl Bromide?



Alternatives to Methyl Bromide

1. Soil disinfestants

- Telone C35,
- Chloropicrin alone?)
(Weeds
- Methyl iodide
- Solarisation
- Metham and dazomet
- Cyanogen??
- Sodium azide?
- Propylene oxide?

2. IPM

- Resistant varieties
- Biofumigants
- Strategic pesticides and herbicides

3. Methods which avoid MB

- Substrates
- Propane Burners (Weeds)

Results in Australia

Treatment	MB/Pic	Unt	TC35	Pic	MS and Pic	MI	Cyan
No of studies	8	6	8	8	2		
Range	100	59-103	75**-105	62-109	82-101		
Average	100	73	91	89	91		

Telone was phytotoxic in low pH/cool soils

Strawberry Runner Production



**Methyl Bromide
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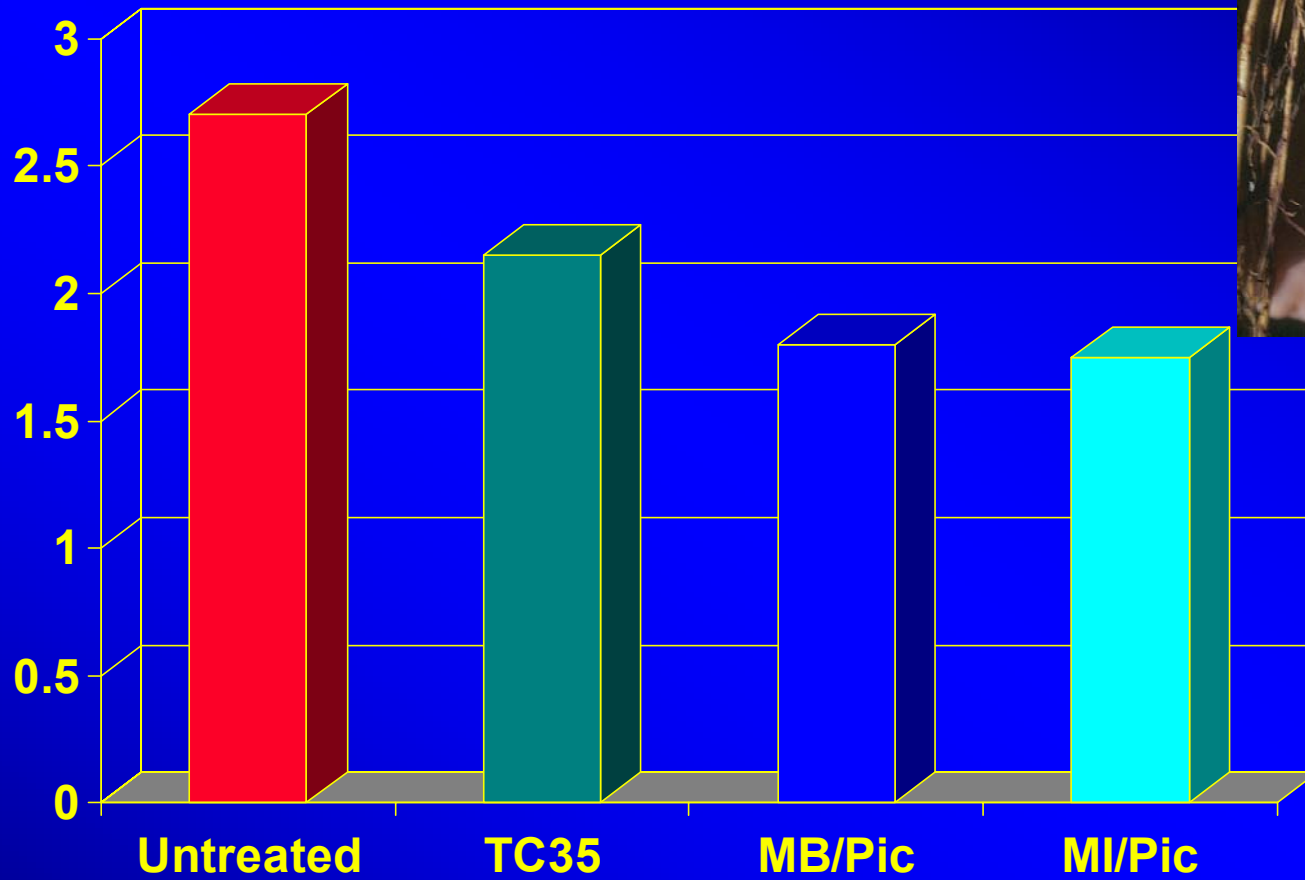


Telone C35



Untreated

Black
Root
Rot
Rating
(0-5)



Rate 500kg/ha - No VIF

Strawberry Plugs



25% of world production?

USA trials: Oxnard 2001/2002



Methyl bromide



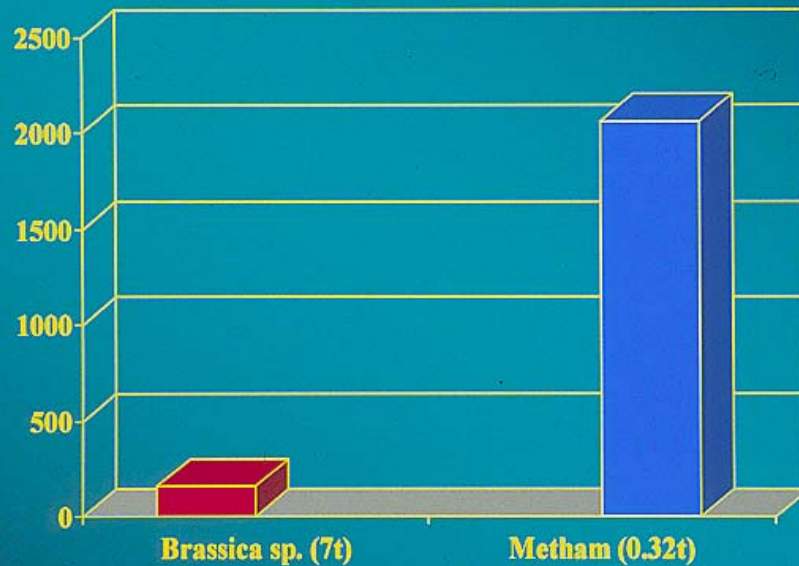
Telone C35



Biofumigation



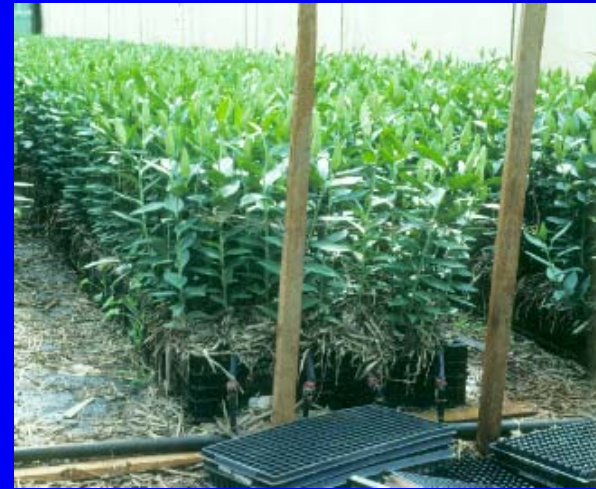
Total MITC concentration in soil from a biofumigant crop vs metham sodium (nmol/g soil)



Excellent rotation and trap crop!

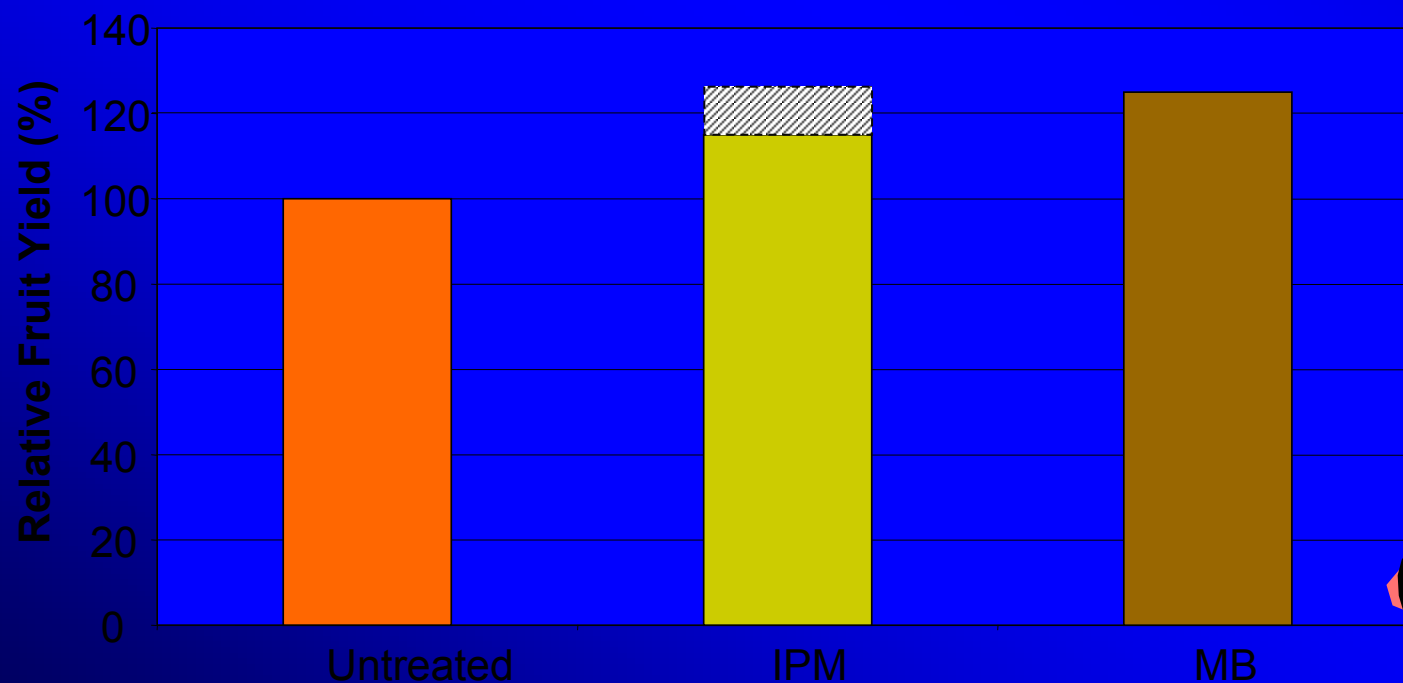
Pathogen control too unreliable!

Influence of MB phaseout on development of New Technologies



Developing IPM alternatives to MB

- a runner dip to surface sterilise roots +
- soil amendment with BCDMH (bromochlorodimethyl hydantoin) +
- slow release ammonium fertilisers +
- pre-emergent herbicides



Issues for Alternatives for Strawberry Nurseries

- **Cool climates**
- **Disease tolerance data cf. methyl bromide**
- **Broad acre treatments**
- **Product which controls weeds as effectively as pathogens**
- **New effective herbicides (Presently limited)**
- **Commercial scale up difficult because of disease loss**

Factors Influencing Change

**Research
Trials**
*(Technical
efficacy)*

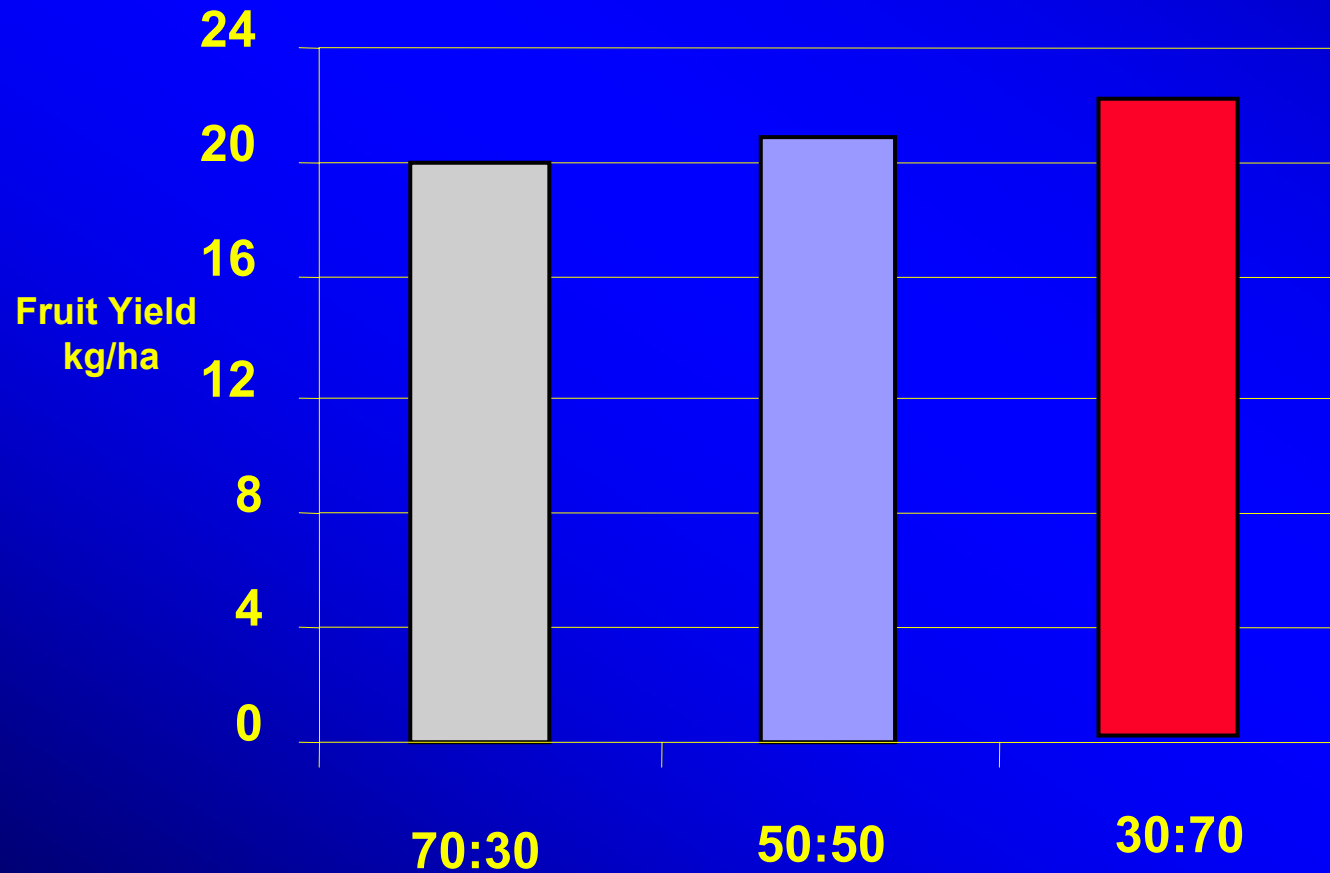
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*Commercial
Scale Up,
Regulatory
&
Economics
Issues*

=

Acceptance?

Transitional Strategy to Reduce MB Consumption

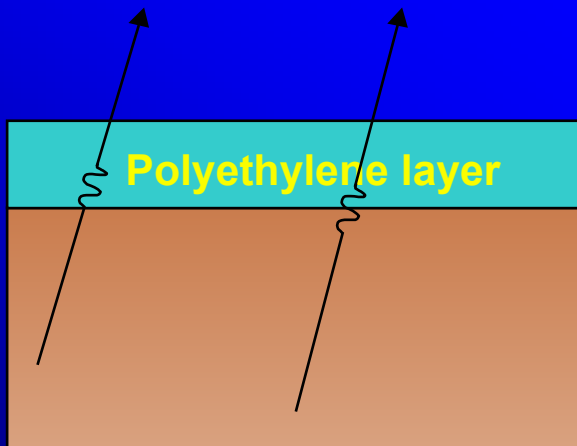


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Barrier Films (eg. VIF) : Methods to Reduce MB Rate and Emissions

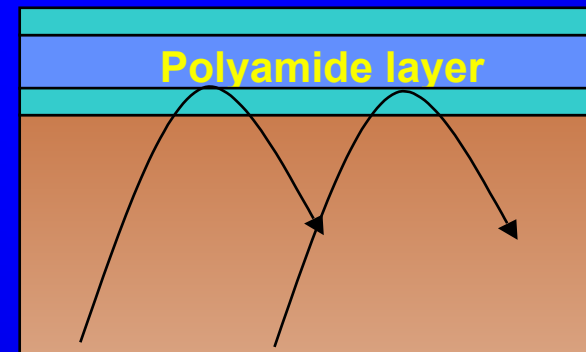
Linear low density polyethylene (LLDPE)



~35 μm monolayer

Rate 20 g/m²

Virtually impermeable film (VIF)



~35 μm , multi layer sandwich

Rate 10 -12.5 g/m²

Issues for Alternatives for Strawberry Nurseries

- **Transition: MB/Pic formulations of 50: 50 effective, so do not use higher formulations**
- **Transition: Rate reduction by use of VIF < 20g/m² (15g/m²)**
- **Plug plants: Economics Hygiene (Colletotrichum)**

Summary

- **Alternatives are proving more difficult than for strawberry fruit because of the high disease tolerance required and the broad spectrum control for weeds**
- **MS and Pic, TelC35 followed by metham, methyl iodide offer the best opportunity for short term alternatives and plug plants for longer term**
- **So far only poor commercial scale, but limited trials limited to USA, Australia and Spain.**
- **More effort in commercial scale up of alternatives**

The Future??





**‘You must be the Change
You want to see in the
World?’**

‘Ghandi’