

Summary for Strawberry Fruit and Nursery Industries



MB supported approx US\$3 billion/yr globally

Key targets

Untreated



Black root rot



Nutgrass



No technical Issue - Alternatives available

Alternatives to Methyl Bromide for Strawberry Fruit Production

1. Soil disinfestants

- Telone C35, In line
- Chloropicrin, Pic EC
- Metham (and dazomet?)
- Methyl iodide (Cost?)
- Cyanogen?, DMDS?
- Solarisation
- Propylene oxide?, Sodium azide?, Propargyl bromide?

2. IPM

- Resistant varieties?
- Strategic nematicides and herbicides

3. Methods which avoid MB

- Substrates
- Propane Burners (Weeds)

Chemical Alternatives (Worldwide, US, Spain, Italy, Australia)



Methyl Bromide/Pic



Telone C35

Commercial scale up - Strawberry Fruit Production





USA

*In Line and MS Drip
irrigated 7 days apart*



Issues to consider: Plant Back Times Vary

Australia



Fumigant	Plant-Back Recommended by Manufacturers	Plant-back Determined in Field Trials
MB (70:30) MB(50:50) MB (30:70)	3 weeks 3 weeks 3 weeks	2 weeks 2 weeks 2 weeks
Chloropicrin	3 weeks	2 - 3 weeks
Dazomet	2 - 4.5 weeks	2-12 weeks
Metham Sodium	2 - 3 weeks	2- 8 weeks
Telone C35	2+ weeks	2- 5 weeks
Vorlex	?	8 weeks

New technologies



Metham



Telone/Pic and Pic EC



Telone/Pic broadcast



Methyl iodide - hot gas

Non Chemical Alternatives

Solarisation and Biofumigants,
Metham



Difficulties:

Inconsistency, rotation

3. Methods Which Avoid Methyl Bromide

Substrate Production



Issues:
Avoids methyl bromide
Lower harvest costs
Fewer pesticides
Flavour?
Economics?

Factors Influencing Change

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

+

*Commercial
Scale Up,
Regulatory
&
Economics
Issues*

=

Acceptance?

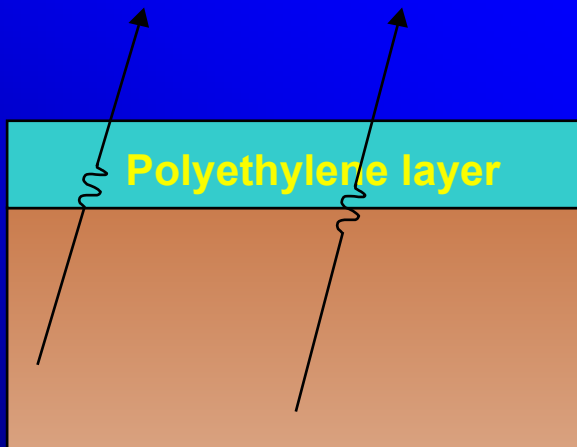
Italy: Strawberry fruit



*Commercial
Scale Up - 3 yrs?*

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

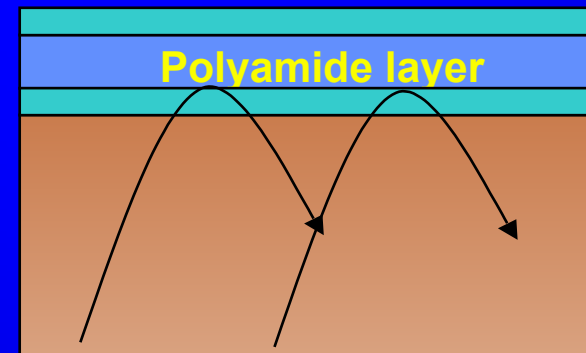
Linear low density polyethylene (LLDPE)



~35 μm monolayer

Rate 20 g/m²

Virtually impermeable film (VIF)



~35 μm , multi layer sandwich

Rate 10 -12.5 g/m²

2004: The Present Situation!

- Telone/Pic (Injected or in line), Pic alone (injected or EC) and combinations with metham are as effective as MB/Pic
- New products promising: Methyl iodide, Di-Methyl Disulfide, Cyanogen?
- New application machinery assisted adoption and commercial scale up
- Substrate production suited and profitable in cooler regions with short seasons and adoption is increasing in many countries.
- Conversion to substrates in temperate regions difficult
- Number of non chemicals being evaluated (Solarisation and biofumigation) which assist sustainable production programs)



Methyl Bromide Fumigation: Strawberry Runner Industry



Issues: Certification, no pathogens, weeds



**Methyl Bromide
50:50**



Untreated

Alternatives not yet reliable for in soil treatment - cool climates

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		

Strawberry Plugs



25% of world production?

Bare Rooted Plants cf. Plug Plants:

- Plugs - Northern Europe, North Carolina
- Cost - 17-21 cf. 8 cents per plant

**Australia - Telone C35 widely adopted
commercially
No CUN for 2006!**

