The use of fumigants and grafted plants as alternatives to methyl bromide for the production of tomatoes,vegetables and strawberries in Italy

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S.I.S. S.p.a. Vittoria-Italy

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SIS S.p.a. is the largest Italian fumigation Company

Italy is the largest Me Br consumer in Europe

How does SIS provide professional soil fumigation service to farms ?

- Through the extension service of a network of 40 agronomist;
- Performing the fumigation directly in the farm with teams of specialized operators: all product is applied exclusively by professionals;
- With in house developed and produced equipment and technology.

To comply with the Montreal Protocol,SIS has pursed three main lines of investigation:

- R&D and production of grafted plants;
- R&D and production in soil-less cultivation;
- R&D and commercial introduction of chemical alternatives.

SIS produces vegetable seedlings at nursery CENTRO SEIA

- CENTRO SEIA produces over 70 millions of plants per year in a nursery of more than 5 hectares of modern greenhouses ;
- A growing portion are grafted plants;
- Seedlings are delivered all over Italy and in several European countries.

Grafted plants

Offer:

- Tolerance to nematodes;
- Resistance to soil born diseases;
- Vigor and tolerance to low temperatures.

Require:

- modern greenhouses ;
- better farming skills;
- higher investments (per Ha).


Centro SEIA


7
6
13
14

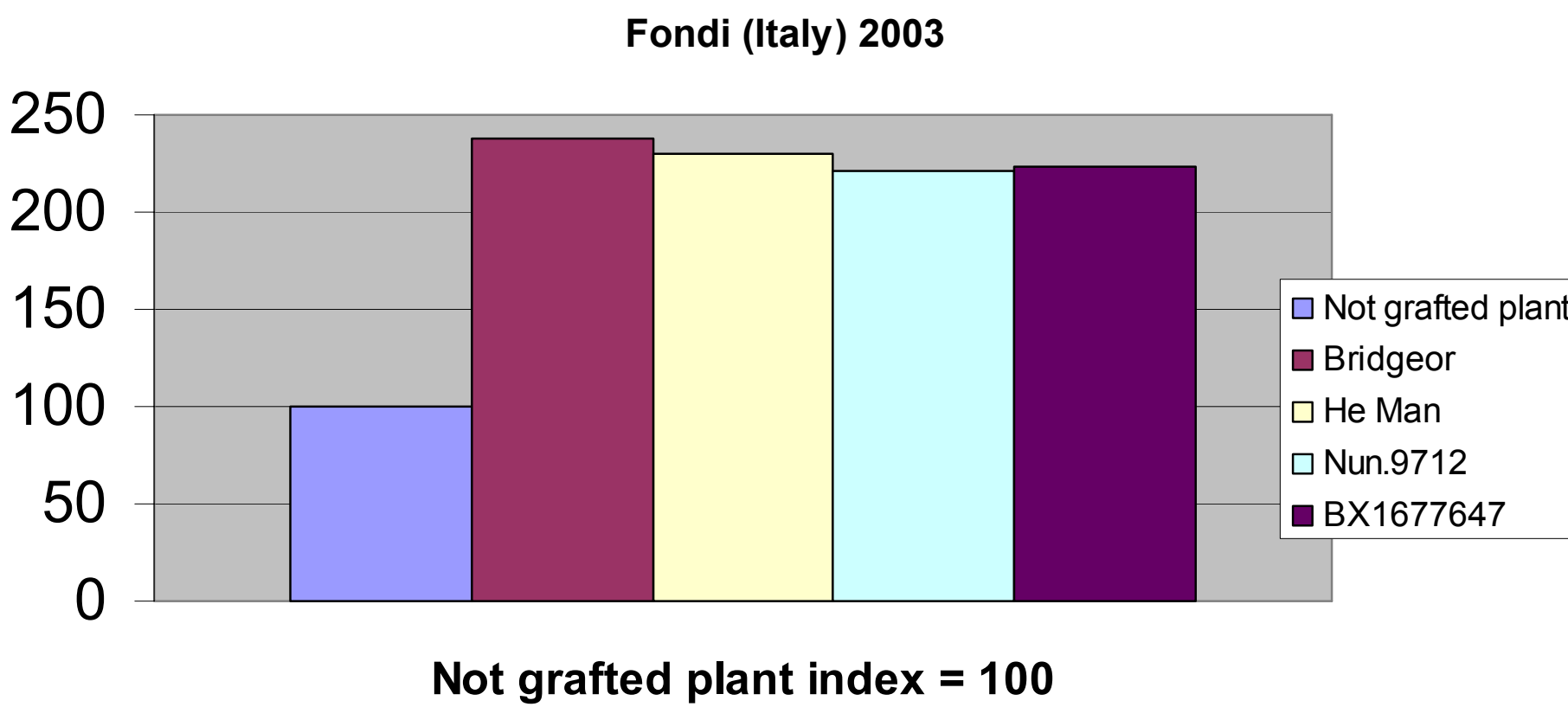
Soil less farming at SIS

- Tomatoes are produced in six Ha glasshouses soil less farm;
- Results are excellent in quality and quantity:

But:

- Technology imply high investments in the glasshouses and requires a technical competence not commonly available.

Yield comparison between several rootstocks and standard tomato



Chemical alternatives

- SIS has actively cooperated with some of the main international research institutes and chemical firms committed to Me Br replacement;
- SIS has executed the registration trials of two new key formulations.

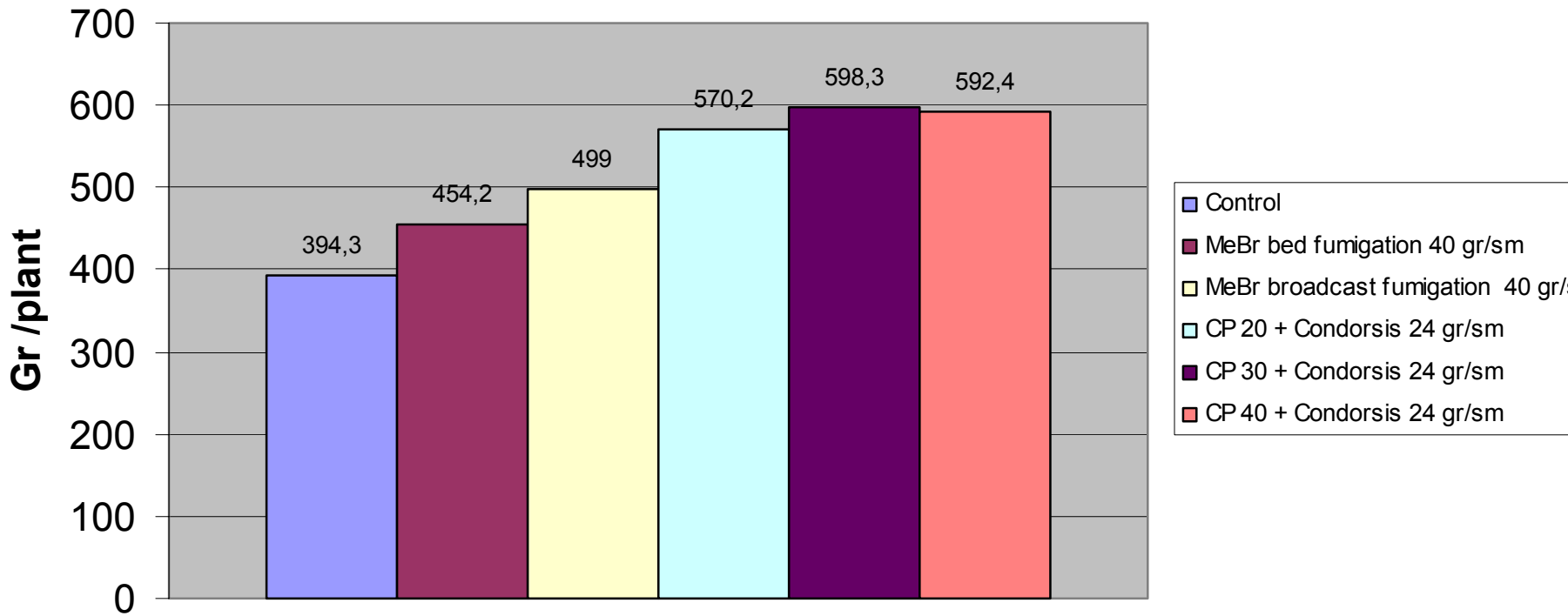
- In November 2001: registration of **CONDORSIS**, nematocide fumigant, the only formulation in Italy based on **1,3-d** which is authorized for use in greenhouses (Dow AgroSciences B.V.);

- In July 2002: registration of **TRIPICRIN**, based on **chloropicrin**, fumigant with fungicidal and herbicidal action (Triagriberia S.L.)

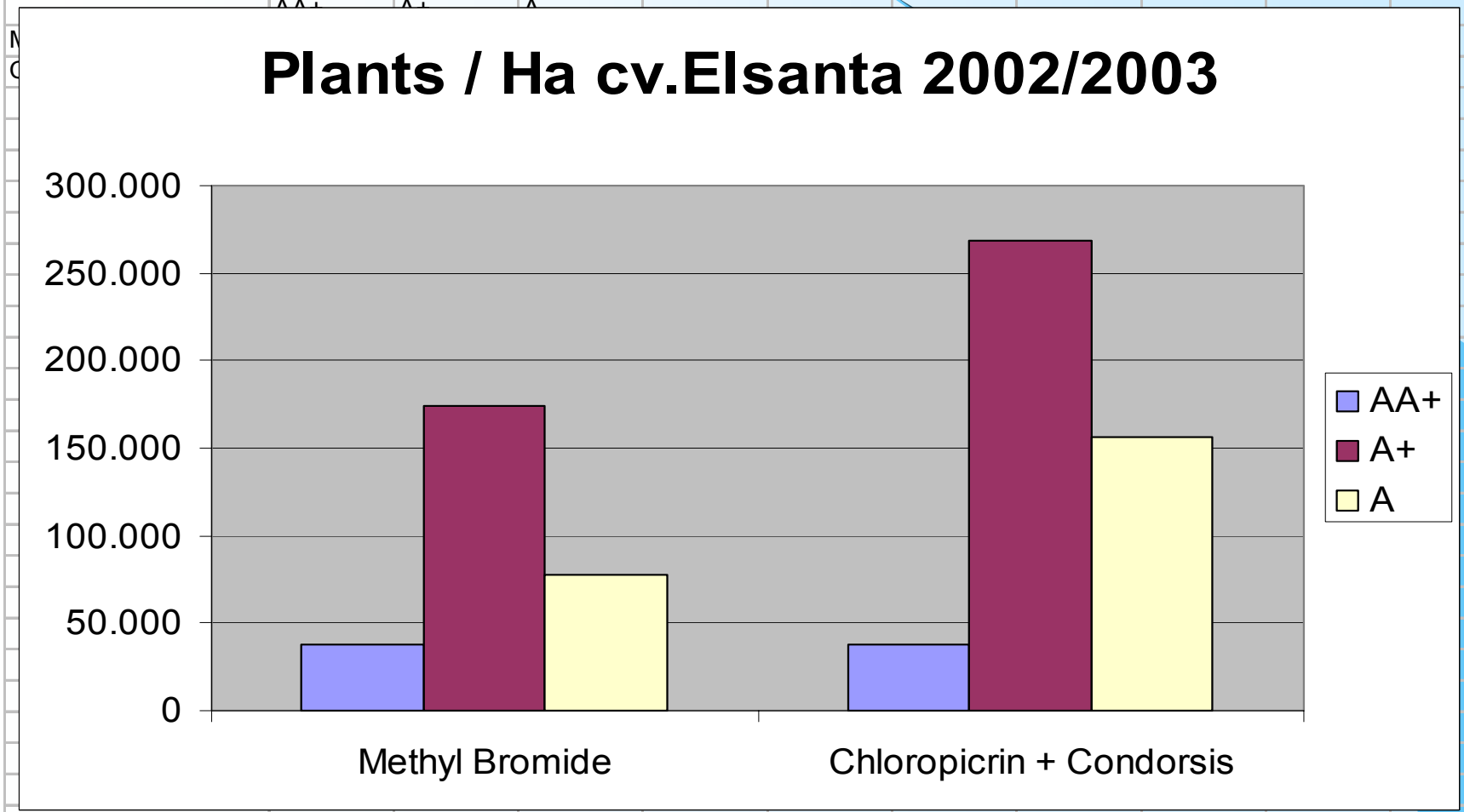
Since 2002 SIS spa has converted the surfaces treated with Methyl Bromide into to co- applications of Condorsis and Chloropicrin at a rate equivalent to:

Year	% converted	N° of growers	N°of applications
2002	5%	200	465
2003	36%	1.534	2.931
2004 (August,)	45%	2.000	4.000

Strawberry yield comparison,Battipaglia (Naples) 2002/2003



Production of strawberry plants in nursery



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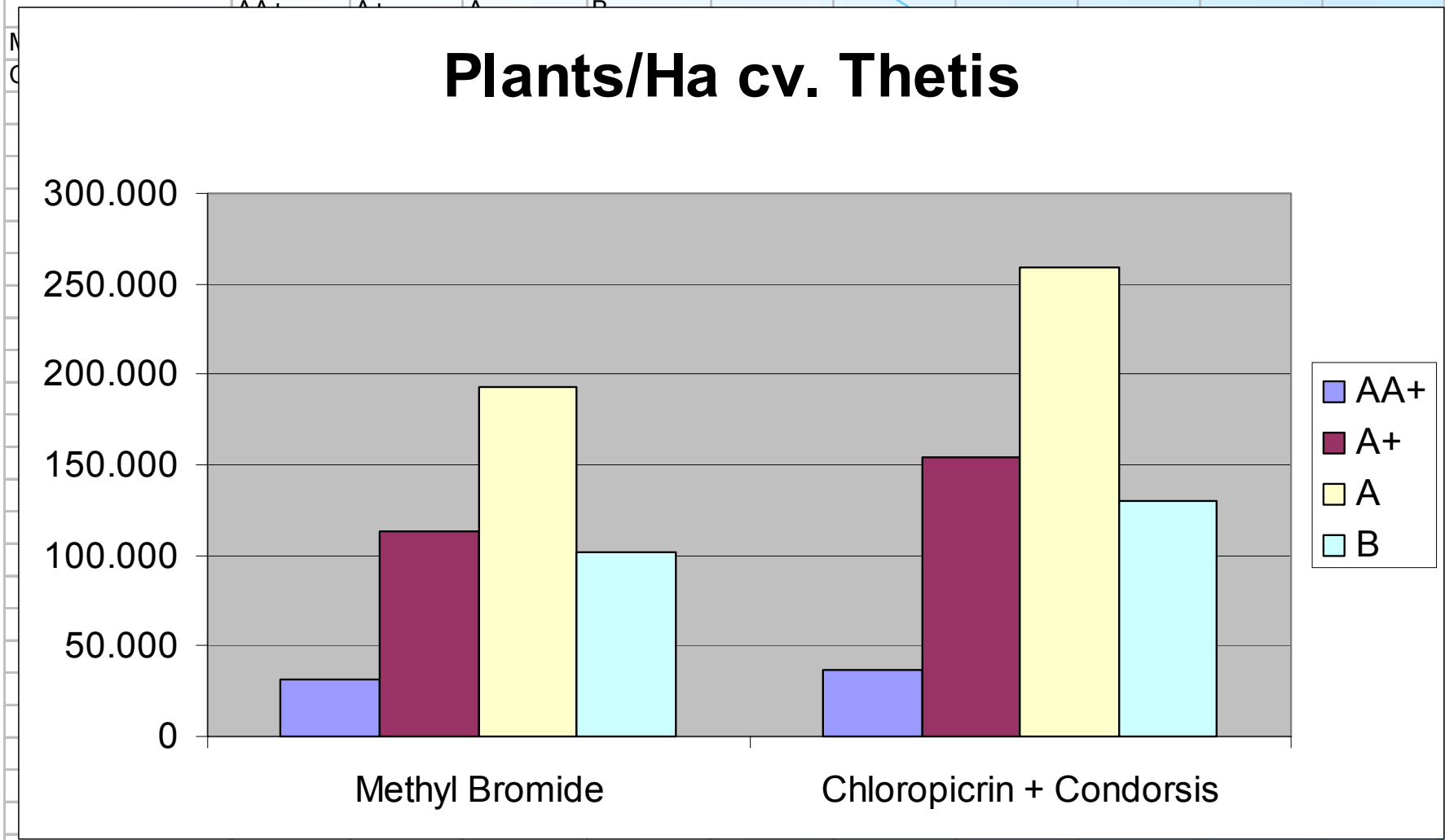
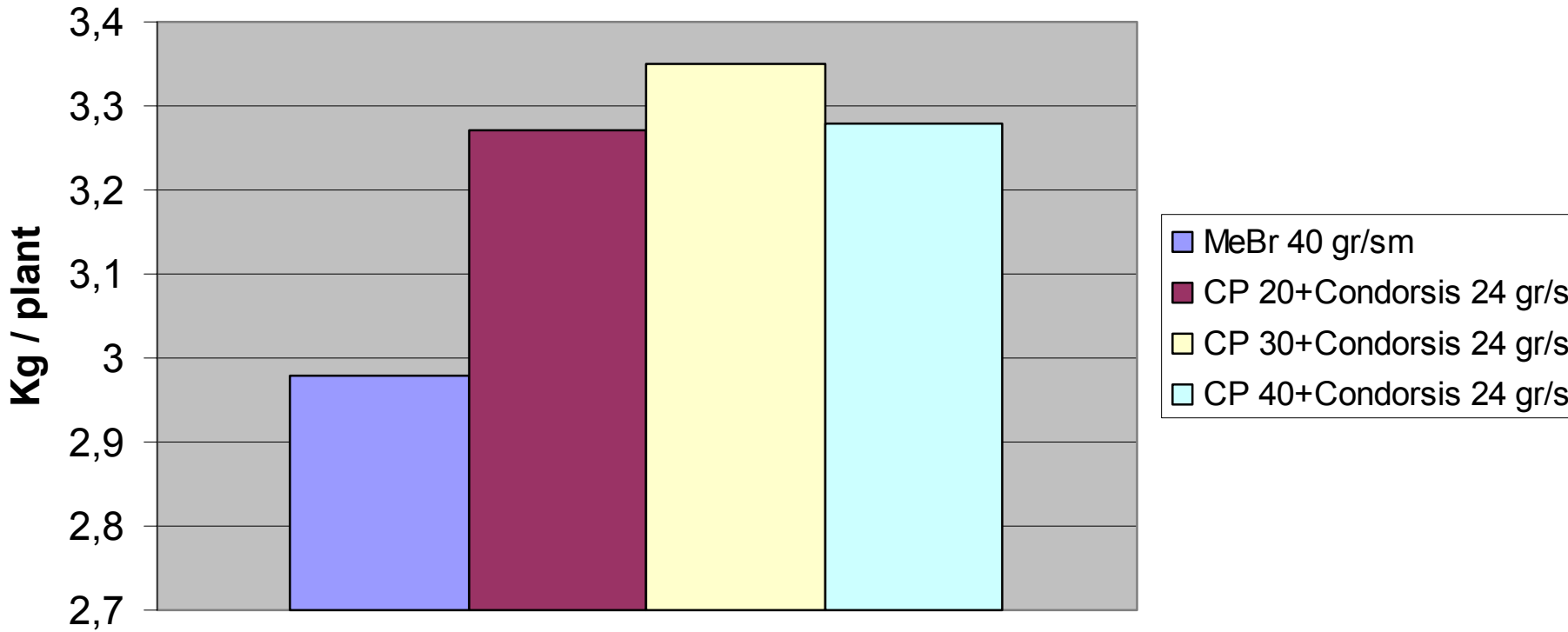
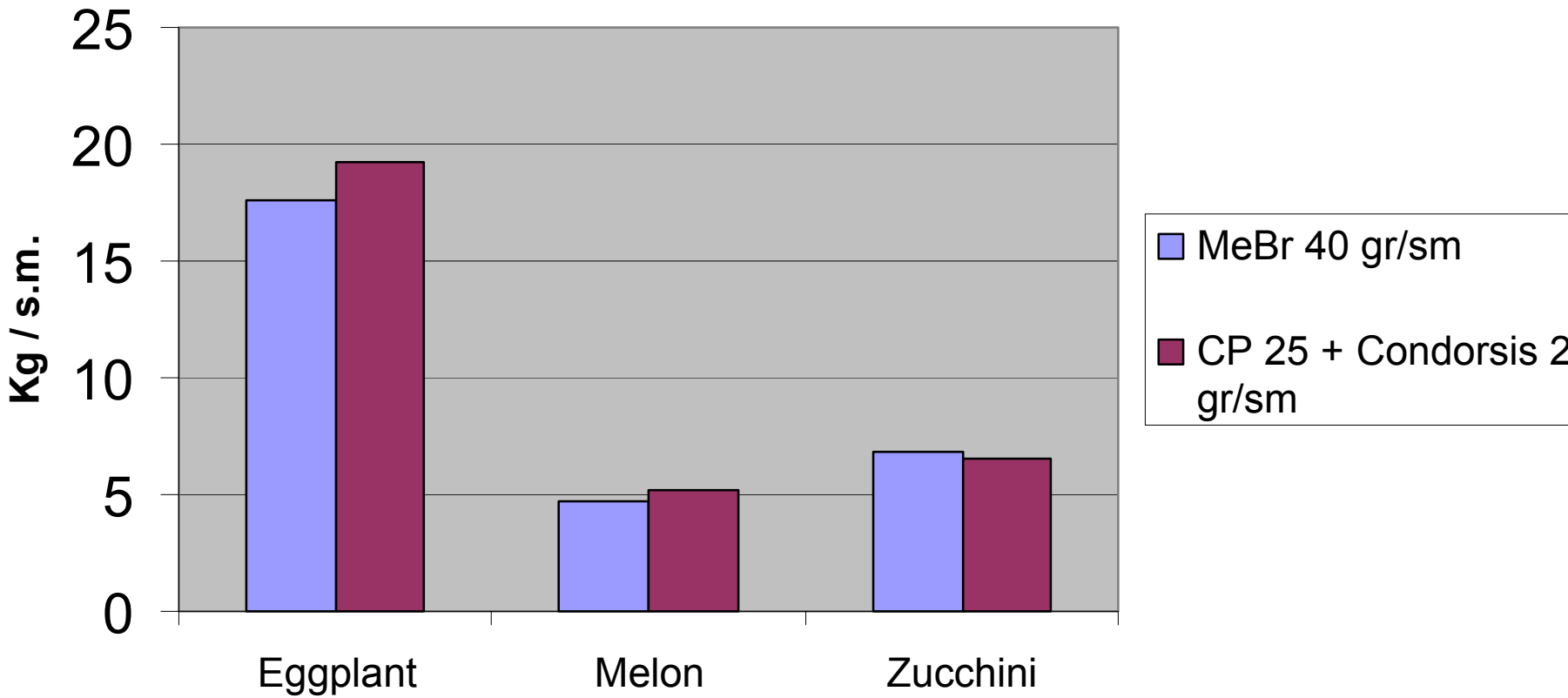


Tomato crop comparison,Terracina (Lt) 2003

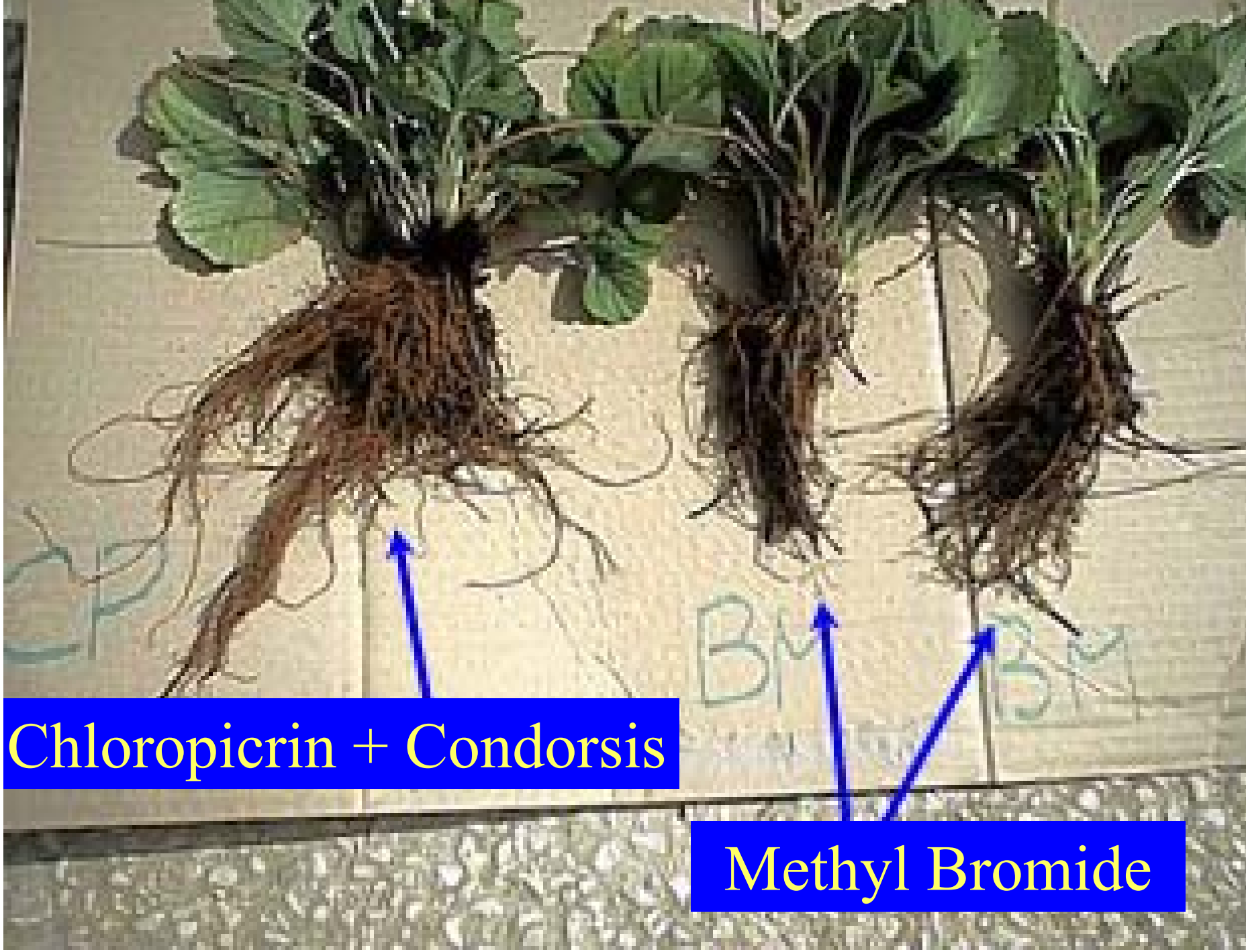


Other crops yield comparison




Methyl Bromide
BROMVRO


Chloropicrin +
Condorsis
SOL INNOVATIVA

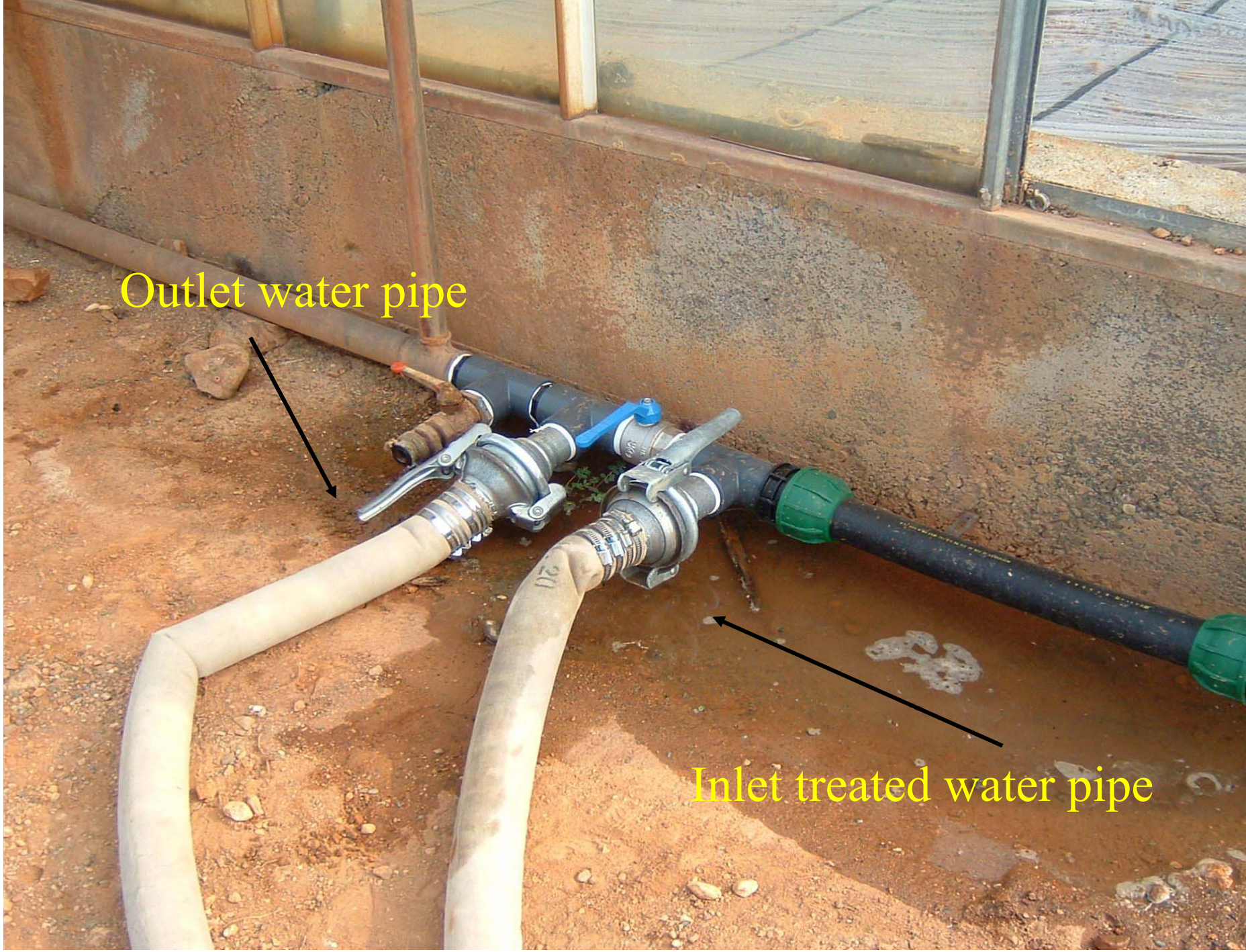

Chloropicrin + Condorsis
Methyl Bromide

•Products are applied with machines developed by SIS:

•In open fields with shank injector that seal the soil with VIF immediately after the application;

•In the greenhouses products are applied thru the drip irrigation system on the soil previously covered with vif.


HIRIS/C COMPUTER CONTROLLER
TROPICRIN T N
CONDOR


Outlet water pipe
Inlet treated water pipe

Pros and cons

- Overall results are excellent: equal or better that MeBr;
- Weed control as shank injected is inferior to MeBr;
- Some limitations at low temperature;
- Pre transplanting interval longer than MeBr.

Conclusions

- The alternatives to MeBr exist: the answer may be different in the different farming realities ;
- Grafted plants, soil less and chemistry are at different degree the solutions ;
- The ability to offer a full technical service in the farm is indeed the key to success ;
- Chemistry,CHLOROPICRIN + CONDORSIS in association,are the closest and easiest alternatives to Me Br.