A project to phase out methyl bromide in Romania: preliminary results

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Background

In Romania greenhouses cover 1,689 hectares: 700 ha are heated during the coldest months of the year. Traditionally, greenhouses were built around the power plants of the main towns in order to use the hot water produced by them for both soil treatment and heating. Starting in 1995, following the liberalization of the energy market, the cost of steaming increased and its use for soil treatment was no more economically sustainable. At present, energy alone accounts for 75% of production costs for protected and heated crops. Because of the increase in energy cost, the surface area covered by heated greenhouses has reduced drastically. At present, the 700 ha still covered by heated glasshouses are distributed over 10 farms. In Romania methyl bromide (MB) became the most suitable fumigant for soil treatment in protected crops: in 1998, 220 ha where fumigated whit 156.5 tons of MB, by adopting an average rate of 700 Kg/ha.

The project

With the financial support of the Italian Ministry for Environment and Territory, UNIDO started in 2001 to implement a project to stimulate the phase out of MB in the horticultural sector. At present, the project is in progress and its final aim is to eliminate all non-essential and non-critical uses of MB in the horticultural sector by the year 2005. The project is involving Unido's project manager, Italian experts of Italian Ministry for Environment and Territory and of Agrinnova (University of Turin), Romanian Ministry of Water and Environmental Protection, throughout its Ozone Office, Romanian Ministry of Agriculture throughout the Horting Institute and finally Romanian farms as users of MB for soil fumigation. The project is implemented in eight sites (S.C. Codlea Greenhouses S.A., S.C. Brasov Greenhouses S.A., S.C. Leader International S.A. - Constanta, S.C. Seromgal S.A. – Galati, S.C., S.C. Rj Import – Export Isalnita, S.C. Leoser S.A. – Bucharest, S.C. Berser S.A. – Bucharest, Ra Apps Pipera - Bucharest), interesting heated and not heated glasshouses. For the 1st crop cycle the growing season starts in December or early January, when tomato and cucumber, the main crops, are seeded in germination beds and ends in mid-June. The 2nd cycle begins with the transplanting of tomato, cucumber or green pepper during July and lasts, subject to weather conditions and market prices, until the end of October. The interval between harvesting the first crop and planting the second one can last from 2 to 6 weeks. If needed, during this period the soil is fumigated: in most cases the application of MB takes place once every three years.

The tested alternatives

Among the alternatives to MB already available, chemical and non chemical ones have been selected. Metham sodium (750 - 1000 kg/ha) applied throughout the drip irrigation system, dazomet (600 kg/ha) mechanically incorporated, soil solarization (applied only before the 2nd cycle for 2-4 weeks) and grafting on resistant rootstocks have been used alone or in combination. Some preliminary results are available at present (table 1): metham sodium gives satisfactory results on tomato, particularly when combined with grafted plants. Similarl promising results have been recorded on cucumber, particularly on grafted plants (data not shown).

Table 1 - Effect of metham sodium and grafting on resistant rootstock on incidence of *Pyrenochaeta lycopersici*, root knot nematodes (*Meloidogyne* spp.) and yield of tomato (cv Cindella) (S.C. Brasov Greenhouses S.A., July 2003)

Treatment*	Plants°	Dosage g of a.i. /m^2	% of infected plants		Galling index (0-5)		Marketable yield (tons/ha)	
None	not grafted	-	85.5	c	2.5	b	97	b
None	grafted	-	2.9	a	0.1	a	133	a
Metham sodium	not grafted	100	46.7	b	0.1	a	114	ab
Metham sodium	grafted	75	3.9	a	0.0	a	122	a

*Date of soil fumigation 22/01/03; date of transplanting 25/02/03; °resistant rootstock: cv Beaufort F_1 De Ruiter seeds

Problems related to implementation of MB alternatives in Romania

Soil solarization, selected to achieve a reduction of rates of soil fumigants (metam sodium, dazomet) (Katan and De Way, 1991), is not easily applicable in the Romanian conditions due to the short time available between the 1st and the 2nd cycle (July - August) of crops and due to the geographical position of the Country. Dazomet, even though representing an interesting alternative, is available in the Romanian market only as powder formulation, risky to be handled due to dust production. Metham sodium represents a suitable and transferable alternative to MB, particularly for its application that can be done throughout the drip irrigation systems (Gullino *et al.*, 2003); unfortunately, drip irrigation is not yet widely available in Romanian farms. Moreover metham sodium is, at the moment, not registered in Romania: in this regard Taminco Company (UCB group) is considering the possibility to register again a metham sodium formulation in Romania. The adoption of grafted plants onto resistant rootstocks was selected as an interesting solution not only to reduce the use of fumigants, but also to improve the quality, the quantity and the duration of the harvest. Actually, Romania nurseries are not able to produce grafted plants "from the seeds to the transplanting material" of high quality as requested by farmers. Many reasons could explain it: first of all grafted plants production needs special facilities and equipment. Moreover during winter time the increase of length of the nursery phase increases the cost needed for the production of grafted plant for the 1st cycle.

Future perspectives

Romania can be considered a small consumer of MB; its usage for soil disinfestations purpose is rather limited to protected crops. Unfortunately, as well as in other countries like Italy, also in Romania the MB phase out must exploit different alternatives in order to find out the most suitable combination to fulfill the specific needs (specie, crop cycle, etc).

Acknowledgments

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