



USE OF 1,3-D/PIC

HISTORY

Agroquímicos de Levante (AQL), since its foundation in 1984, has centred its main activity in soil disinfection treatments, reaching 80% of the Spanish market that used MeBr (3,800 MT/year).

AQL also, has substantial expertise in fumigation treatments based on mechanized injection, using its own machinery and with own patents.

From 1995, when it was clear the phase-out of MeBr, AQL approved a R+D programme that started in 1996, dedicated to look for alternatives to MeBr. In 2000, we obtained the first registrations in Spain of a mixture of 1,3-Dichloropropene and chloropicrin, trade name AGROCELHONE.

	1,3-DICHLOROPROPENE	CHLOROPICRIN	FORMULATION
AGROCELHONE N	61,1% (w/w)	34,7% (w/w)	AL
AGROCELHONE NE	60,8% (w/w)	33,3% (w/w)	EC
AGROCELHONE F	40,6% (w/w)	56,7% (w/w)	AL
AGROCELHONE FE	36,7% (w/w)	52,8% (w/w)	EC

PROPERTIES OF THESE PRODUCTS

- Liquid fumigant
- Acts against nematodes and soilborne fungi, and has action on germinating weeds.
- Applied to the soil before sowing or planting.
- Classified as Very Toxic (T+), as MeBr
- Less dangerous for the technicians who apply the product due to 2 main reasons:
 - it's liquid and not gas
 - it does not required large pressures
- It's degraded in the soil, avoiding problems of residues in the fruits.
- Provided the safety period is kept, the risk of phytotoxicity will be eliminated for the plants or seeds.

- Easier for application and more versatile:
 - by mechanized injection



Localized Treatment of the Bed



All Terrain Treatment in alternating bars



Localized Treatment in fla

and ...

- Application by drip irrigation



All Terrain Treatment

Localized Treatment



CROPS IN SPAIN

HUELVA PROVINCE

Alternatives used

Agrocelhone N

Agrocelhone NE

Agrocelhone F

COSTS / HA

	Cost/kg	Rate-Dosage	Film cost	Film consumption	Application	TOTAL
MeBr 50/50	4,60 €/kg	200 kg/Ha	1,25 €/kg	415 kg/Ha	144 €	1.583 €
Agrocelhone	3,20 €/kg					1.303 €

% of the market	2000	2001	2002	2003	2004 (FORECAST)
MeBr	65%	45%	40%	42%	47%
Agrocelhone	TRIALS	10%	14%	11%	13%

STRAWBERRIES

CROPS IN SPAIN

MURCIA PROVINCE

Alternatives used

Agrocelhone NE

Agrocelhone FE

COSTS / HA

	cost/kg	Rate-Dosage	Film cost	Works and application	irrigation	TOTAL
MeBr 98/2	5.60 €/kg	400 kg/ha	3.90 €/kg (VIF)	888 €	---	4298 €/ha
Agrocelhone NE AT	3.90 €/kg	500 kg/ha	1.60 €/kg	830	181 €	3380 €/ha
Agrocelhone NE B	3.90 €/kg	300 kg/ha		849	80 €	2339 €/ha

PEPPERS

OTHER CROPS AUTHORIZED IN SPAIN

Tomatoes



Cut flowers



Onions



Tobacco



crops BEING registered

Grape



Cucumber



Beans



Potatoes



Carrots



Eggplants



Examples of countries where MeBr is being substituted



LEBANON: 1,3-D/pic is being commercialized, and is being used for vegetables crops mainly. Currently our partner company is collaborating with UNDP and UNIDO, doing trials with 1,3-D/pic as alternative to MeBr in the crops of strawberries, carnations and vegetables.



CHILE: The first country where we started commercialization in South-America. Authorization of the product occurred in 2003. 1,3-D/pic is now being used mainly in the crops of vineyard, tomato and strawberry.



PORTUGAL: It's being registered for the crops of tomato, strawberry, cut flower and tobacco. A number of fumigations done in these crops in Portugal gave very positive results and showed that 1,3-D/pic can substitute for MeBr in a reliable way.



CUBA: In this country we conducted work for 2 years, trialling and demonstrating 1,3-D/pic as alternative to MeBr in tobacco seedbeds. We also completed many trials in vegetables crops (tomato, peppers...). Recently the product was authorized, and commercial sales are due to start later this year.



MOROCCO: 1,3-D/pic was authorized on 2003, and currently is in the second season of commercialization. The results obtained in the registration trials and in demonstration trials in some important farms in the most important crops like tomatoes and strawberries, form a sound basis showing that it is completely viable for 1,3-D/pic to substitute for MeBr in Morocco.

Sampling at 150 days of trasplanting



AGROCELHONE



MeBr



Control

COSTS / Ha			
	cost/kg (applied)	Rate-Dosage	TOTAL
MeBr 98/2	56 Dirhams/kg -- 5.09 €/kg	240 kg/ha	13,440 Dh/Ha -- 1,222 €/Ha
Agrocelhone	50 Dirhams/kg -- 4.54 €/kg	180 kg/ha	9,000 Dh/Ha -- 817 €/Ha

% of the market	2004
MeBr	90%
Agrocelhone	8%

Countries in registration process

GUATEMALA



CHINA



JORDAN



COSTA RICA



GREECE



ARGENTINA



AUSTRALIA



CONCLUSION

- AQL, a major MeBr fumigation company in Spain, has made large efforts in the research and commercialization of alternatives to solve the serious problem regarding the phase out of MeBr.
- The work done during many years by the professional team that composes AQL, led to the successful adoption of these 1,3-D/pic products among MeBr users.
- The research programme not only focussed on developing alternatives to MeBr, but also ensuring very effective techniques of application that are viable for each formulation, injectable or EC. The efficacy of the products (for fruit production and quality) is therefore the same as MeBr.
- 1,3-D/pic application methods were developed to be used in any crop, since the application is done before sowing or planting.
- 1,3-D/pic can be used in any type of soil, for sand, loam and even clay soil. The different soil type determines the rate and the system of application to be used.
- Every size of area can be disinfected. Small areas: using drip irrigation formulations, while large areas generally use injection methods.
- For the correct application, the temperature of the soil should be between 10-40 °C at 10 cm. depth

CONCLUSION

- The data shows that the costs of these alternative treatments are 20-40% cheaper than MeBr, depending on the plantation marks.
- Currently, AGROCELHONE is present in 5 continents, either in the registration process or already registered and in commercial use.
- AQL is open and disposed to collaborate with every Government that may request our assistance, and together find the best and viable way to substitute MeBr, tailoring technical methods and formulations according to the local agricultural characteristics.

**Con Seguridad
más Saludable:**

AGROCELHONE^{NE}

**Controla Hongos
y Nemátodos**



**THANK YOU FOR YOUR
ATTENTION**

**LOOK AFTER OUR
WORLD, IT'S YOUR
FUTURE**