IMPROVING DICHLOROPROPENE AND CHLOROPICRIN MIXTURES BY INCREASING CHOLOROPICRIN RATE.

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The mixture 1,3-Dichloropropenene (Dic) and Chloropicrin (Pic) joints the Nematicidal and fungicidal activities of both chemicals. The most common formulation uses a a higher rate of Dic to enhance the nematicidal effect. Other formulations with increased concentration of Pic have the aim to enhance its fungicidal effect against soil fungi

Material and methods

The mixtures to compare was the standard mixture and 55.5%Dic+32.7% Pic (AFE) vs. the new 36.7% Dic+ 52.8% Pic (ANE). As a reference was used MB 98% + 2%Pic.as advertiser.

Experiments were carried out in a pepper crop area at the south (Pilar de la Horadada) and in an area of artichoke crops at the north.(Benicarló) of Valencian country (Spain).

Two pepper greenhouses were selected in which *Phytophthora capsici* was the main pathological problem and two open air fields infested with *Verticillium dahliae* were selected in artichokes.

The soil was prepared with a deep plough followed by rototiller Aplication of fumigants was done by drip irrigation in pepper greenhouse and one of the artichoke, fields while the other application was done by flood irrigation.

Biocidal effect was monitored with biological probes consisting in roots of diseased plants infected by *Fusarium oxysporum* at 10 and 30 cm depth. After disinfestations the rootlets were transferred to petri dishes with selective media (Komada). Weed incidence was monitored by weeding cost in time (min/plant) alon the crop.

The yield in pepper crop was classified by colour (red and green), size (big, small and industry), and earliness (early up to May and Total up to mid July) for each other classifications. Because of the high risk of *P. capsici* reinfestation control plots were avoided in this trial. Vigour and uniformity was recorded as an index (1-5).

Artichokes were classified by 1st and second quality and debris, and earliness.(Early up to April). Marketable yield is considered 1st and 2nd quality. To quantify vigour, the longest leaf of each plant was measured.

Results

Pepper

Fungicidal effect up to 10cm was as good for AFE as MB, while ANE have less effect .At 30cm depth. Neither ANE or AFE destroyed inocula while MB gave a good control.

The total yield did not show statistical differences among treatment, but AFE was significantly better than ANE when only early yield was considered.

Plant mortality was better controlled by AFE and BM with significant differences with respect to ANE

No differences were found in vigour and uniformity of plants among treatments

Artichokes

Both treatments ANE and AFE gave excellent fungicidal effect a 10 cm depth but the control was also good at 30cm.

The effect on weeds was good with no significant differences among treatments, only control treatment was severelly affected by weeds.

Mortality of plants was quite low even in control treatment in this first year of the crop, nevertheless *V. dahliae* was producing a severe disease in control plants. Only MB and AFE ended the crop with all plants alive. No differences were found in terms of vigour, only control had smaller plants. The early yield and total marketable yield was higher for AFE but differences were no significant with respect to MB and ANE.

Conclusions

In a general view as ANE as AFE are good alternatives to MB. With no statistical differences between them in some parameters.

The effect of AFE in plant mortality results better than ANE in such cases in which fungi are the main soil pathogens of the crop.

From the Total yield point of view ANE an AFE have a similar behaviour but AFE gives higher early yield than ANE due to its better fungicidal effect. AFE is than more recommended in the case of soil fungi such as *P. capsici* or *V. dahliae* have to be controlled by preference.

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Table 1 . Biocidal effect, vigour, uniformity, weeding cost and yield, early and Total (Kg/plant) for pepper crops at Pilar de la Horadada.

Treat.	Biocidal effect %		Vigour	Unif	Weeds	Mortality	Early	Total
	10 cm	30 cm	(1-5)	(1-5)	min/p	%	yield	Yield
MB	100	100	3.4 a	2.0 a	1.3 a	0.11 a	2.1ab	4.6 a
ANE	100	0	3.1 a	2.3 b	1.5 a	0.35 b	2.1 a	4.3 a
AFE	60	0	3.3 a	2.3 b	1.5 a	0.28 ab	2.3 b	4.3 a

Table 2 .Biocidal effect, vigour, weeding cost (min/plant) and yield, early and Total (Kg/plant) for artichokes crops at Benicarló.

Treat.	Biocidal effect %		Vigour	Weeds	Mortality	Early	Total
	10 cm	30 cm	Leaf Long. cm	min/p	%	yield	Yield
Control	0	0	52.2 a	8.8 a	7.6 a	0.08 a	0.83 a
MB	100	100	86.7 b	0.9 b	0.0 c	0.38 b	1.65 b
ANE	100	90	73.0 b	0.9 b	2.5 b	0.41 b	1.91 b
AFE	100	95	73.8 b	0.7 b	0.0 c	0.61 b	2.07 b