

DEMONSTRATIONS ON MB ALTERNATIVES FOR RASPBERRY IN MEXICO. 2010-2013 RESULTS.

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The Mexican Government, through the Secretary of Environment and Natural Resources (SEMARNAT), in cooperation with the United Nations Industrial Development Organization (UNIDO), have developed a Pilot Project for the demonstrations of alternatives to the MB on raspberry. This Project has allowed field-scale activities since 2010/2011 in the area of Jocotepec (Jalisco) and in the area of Zamora/Jacona (Michoacán) with the cooperation of BerryMex and Driscoll's companies.

In Jalisco, the chemical alternatives were tested in cooperation with BerryMex in the area of Jocotepec (northwest of Lake Chapala). The farms were: "Rancho El Crucero" (2010/2011), "Tabachines" (2010/2011 and 2011/2012), "El Mirador" (2011/2012 and 2012/2013), "El Derramadero" (2011/2012). In Michoacán the demonstrations were located in the area of Jacona/Zamora Valley: "Rancho Los Pinos" (Jacona) (2010/2011, 2011/2012 and 2012/2013) and "Rancho Las Majadas" in the area of Ecuandureo (2012/2013). Cultivars were 'Holyoke', 'Carmina', 'Pacífica' and 'Ambrosia' (Driscoll's).

Each fumigant (treatment) was evaluated in a standard high tunnel of 400 m². The tested alternatives have been: 50:50 MB:chloropicrin; chloropicrin; 1,3-Dichloropropene:chloropicrin, Metam sodium, Methyl iodide:chloropicrin (98:2 and 33:67 w/w), essential oils, biosolarization and mixtures of 1,3D:Pic with microorganisms with different rates of application. The standard of method of application was pre-plant drip irrigation under preformed beds. The standard application dates were: mid of June to mid of July. The standard planting dates were according with cultivar utilization; from mid of July ('Pacífica') until end of August ('Holyoke' and 'Carmina').

Total colony forming units per gram of dry soil (CFU/g) of soil borne fungi, before and after application, were estimated in each treatment and demonstration. The recorded traits have been: canes number per lineal meter, plant height, weed control, early and total yield and fruit size. A summary of total commercial yield is presented in Tables 1 (Jalisco) and 2 (Michoacán). Results will be presented and discussed. The current status of soil disinfestation for raspberry in Mexico (A5) will be discussed.

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Table 1. Jalisco. Total commercial yield (kg/tunnel). (October/June). 2010-2013.

Treatment	2010/2011	2010/2012	2011/2012		2012/2013
	Crucero	Tabachines	Mirador	Derramadero	Mirador*
	'Pacifica'	'Holyoke'	'Carmina'	'Holyoke'	'Ambrosia'
MB:Pic 50:50 240kg/ha	921	929	-	-	-
MB:Pic 50:50 400 kg/ha	-	-	567	1225	202
Pic 240 kg/ha	1027	960	-	-	-
Pic 350 kg/ha	-	-	706	1298	215
Pic 350 kg/ha+microorganisms	-	-	924	1327	-
1,3D:Pic 240 kg/ha	962	1048	-	-	-
1,3D:Pic 400 kg/ha	-	-	721	1138	183
MS 2000 l/ha	895	1020	-	-	-
MS 1000 l/ha	938	998	-	-	-
MS 400 l/ha	-	-	672	1021	215
Midas 98:2 110 kg/ha	903	922	753	812	-
Midas 33:67 220 kg/ha	899	885	651	774	146
Essential oil	-	997	-	-	-
Untreated	701	-	598	-	153
Mirador* ('Ambrosia'), period of harvest: January/April 2013					

Table 2. Michoacán. Total commercial yield (kg/tunnel). (October/March). 2010-2013.

Treatment	2010/2011	2011/2012		2012/2013	
	Los Pinos	Los Pinos		Los Pinos	Las Majadas
	'Pacifica'	'Carmina'	'Holyoke'	'Holyoke'	'Holyoke'
MB:Pic 50:50 240/280 kg/ha	600	1271	-	-	325
MB:Pic 50:50 470 kg/ha	-	-	-	-	-
Pic 220/240 kg/ha	589	-	-	736	231
Pic 350 kg/ha	-	1174	-	-	-
1,3D:Pic 240 kg/ha	674	-	-	-	-
1,3D:Pic 330 kg/ha	-	-	-	-	286
1,3D:Pic 400 kg/ha	-	1243	-	-	-
MS 1500 l/ha	660	-	-	-	-
MS 750/1000 l/ha	671	1105	-	-	-
MS 400/500 l/ha	-	-	1034	-	324
MS 500 l/ha+microorganisms	-	-	959	-	-
Midas 98:2 110 kg/ha	483	-	1094	-	-
Midas 33:67 110/220 kg/ha	455	-	1083	-	337
Biosolarization with mushroom compost	-	-	-	864	
Untreated	-	-	617	-	255