

DEMONSTRATIONS ON MB ALTERNATIVES FOR STRAWBERRY 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 strawberry. This Project has allowed field-scale activities since 2007/08 in San Quintín (Baja California) and in Zamora/Jacona and Tangancícuaro (Michoacán) and Jocotepec (Jalisco) since 2010/2011 in cooperation with Berrymex, Driscolls, and other berry companies. We describe our last three seasons of research carried out between 2011 and 2013. As antecedents, the 2007/08 to 2009/10 results were presented in MBO International Conference (see Coteró et al. 2008, 2009) and in López-Aranda et al. (2012).

In Baja California, during the cultivation periods of 2010/11 and 2011/12 chemical alternatives have been tested as field scale demonstrations (2,000 m² per fumigant) in cooperation with five important producers in the San Quintín Valley. The farms were located along the coast, “Rancho Don Juanito” (Colonia Vicente Guerrero), “Rancho Agrolhibere” (Colonia Vicente Guerrero) (2011/2012), “Rancho Santa Mónica” (Colonia San Quintín), “Berrymex” (Ejido San Simón) and “Rancho Agrícola San Simón” (Ejido Sánchez Díaz). Also, in 2012/13, were developed field scale demonstrations (1 hectare per treatment) with Metam Sodium applications with Rotary Spader (Imants®) implement with a working width of 300 cm. Strawberry cultivars were ‘Splendor’ and ‘Driscoll El Dorado’.

In Jalisco, the chemical alternatives were tested in cooperation with Berrymex in the area of Zapotitan de Hidalgo (near Jocotepec). The farms were: “Rancho Hernández” (Berrymex) (2010/11 and 2011/12), and “Rancho Los Olivos” (Berrymex) (2012/13) with ‘Osceola’ cultivar. In Michoacán, eight field scale demonstrations with chemical and some non-chemical alternatives (biosolarization) were located in the area of Jacóna/Zamora Valley: “Rancho Los Espinos” (2010/11) (cv. ‘Osceola’) and “Rancho Amescueño” (2011/12) (cv. ‘Monarca’), Driscoll’s Experimental Farms of “Tamandaro” (2011/2012) and “El Sabino” (2012/13) (cv. ‘Osceola’), “Rancho La Calzada” (2012/13) (cv. ‘Sweet Ann’); and in the area of Tangancícuaro Valley “Campo La Huerta” (2010/2011) and “Rancho Miguel Mariscal” (2011/12) (cv. ‘Osceola’); also “Rancho

Prosperidad” in the area of Tangamandapio (2012/13) (cv. ‘Osceola’). 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), biosolarization (Driscoll’s Experimental Farms), 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 and planting dates were: mid to end of September and mid to end of October in Baja California farms, and first to mid of July and first to mid of August in Jalisco and Michoacán. 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: replanting percentage, plant size (diameter), weed control, early and total yield and fruit size. A summary of total commercial yield is presented in Tables 1, 2, 3. Results will be presented and discussed. The current status of soil disinfestation for strawberry in Mexico (A5) will be discussed.

References

López-Aranda, J.M.; Urbina, S.; Castellá, G.; Estrada, J.F.; Coterio, M.A. 2012. Large Plot Demonstrations for Methyl Bromide Alternatives on Strawberry in Baja California, Mexico. Acta Hort. (ISHS), 926: 415-422.

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Table 1. Baja California. Total commercial yield (kg/bed). (January/May). 2010-2012.

Treatment	2010/2011				2011/2012				
	DJ*	BM	SM	SS	DJ	BM	SM	SS	AL
MB:Pic 50:50 400 kg/ha	628a	647 b	399 a	832bcd	367 a	330 a	909 a	612 c	349 b
1,3D:Pic 500 kg/ha	541 d	646 b	395 a	848 bc	365 a	328 a	920 a	645bc	361ab
Pic 500 kg/ha	564 c	626 b	392 a	806 d	354 b	323 a	868 b	674 b	347 b
MS 400 l/ha	-	-	402 a	856 b	-	-	-	-	-
MS 800 l/ha	-	-	397 a	944 a	-	330 a	898 a	682 b	384 a
Midas 98:2 110 kg/ha	-	675 a	398 a	-	347 c	319 a	914 a	610 c	343 b
Midas 98:2 220 kg/ha	438 e	-	-	813 cd	-	-	-	-	-
Midas 33:67 200 kg/ha	-	-	409 a	-	339 d	319 a	857 b	743 a	339 b
Midas 33:67 390 kg/ha	375 f	-	843bc	-	-	-	-	-	-
*Farms key: “Don Juanito” (DJ); “Berrymex” (BM); “Santa Mónica” (SM); “San Simón” (SS); “Agrolhibere” (AL). The same letter in each column not significantly different ($0.5 \leq P$) by the LSD test.									

Table 2. Baja California. Total commercial yield (kg/bed). (January/April). 2012-2013.

Treatment	“Agrolhibere” open air	“Santa Mónica” open air	“Berrymex” plastic tunnel	“San Simón” plastic tunnel	Average 4 locations
MB:Pic 50:50 400 kg/ha in pre-plant drip irrigation	341	391	385	574	421
MS broadcast applied with Rotary Spader	321	353	323	503	375
Not significant differences ($0.5 \leq P$) by the LSD test in each column.					

Table 3. Jalisco. Total commercial yield (kg/tunnel). (October/March). 2010-2013.

	2010/2011	2011/2012	2012/2013
	“Hernandez”	“Hernandez”	“Los Olivos”
MB:Pic 50:50 240 kg/ha	1173	-	-
MB:Pic 50:50 400 kg/ha	-	1225	727
Pic 240 kg/ha	1344	-	-
Pic 350 kg/ha	-	1298	1055
Pic 350 kg/ha+ microorganisms	-	1327	-
1,3D:Pic 240 kg/ha	1214	-	-
1,3D:Pic 400 kg/ha	-	1138	1006
MS 1500 l/ha	1147	-	-
MS 750 l/ha	1084	-	-
MS 400 l/ha		1021	800
Midas 98:2 VIF 110 kg/ha	966	812	-
Midas 33:67 VIF 220 kg/ha	892	774	906
Untreated	755	-	-

Table 4. Michoacán. Total commercial yield (kg/tunnel). (October/March). 2010-2013.

Treatment	2010/2011		2011/2012			2012/2013		
	LE*	LH	EA	MM	EFT	EFES	RP	LC
MB:Pic 67:33 470 kg/ha	-	-	-	-	1519	-	-	-
MB:Pic 50:50 240/280 kg/ha	2409	1106	-	-	-	1248	1605	1712
MB:Pic 50:50 470 kg/ha	-	-	2144	1211	1456	-	-	-
Pic 220/240 kg/ha	2139	973	-	-	-	1350	1369	1743
Pic 280/350 kg/ha	2376	999	2173	1204	1410	-	-	-
1,3D:Pic 240 kg/ha	2251	1247	-	-	-	-	-	-
1,3D:Pic 280/330 kg/ha	2269	1502	-	-	-	1437	1452	1874
1,3D:Pic 400 kg/ha	-	-	2162	1170	1421	-	-	-
1,3D:Pic 330/400 kg/ha +microorganisms	-	-	-	-	1450	1556	-	-
MS 1500 l/ha	2238	1105	-	-	-	-	-	-
MS 700/750 l/ha	2377	1187	2191	1264	1219	-	-	-
MS 600 l/ha sprinkler	-	-	1973	-	-	-	-	-
MS 500 l/ha	-	-	-	-	-	-	1196	-
MS 400 l/ha	-	-	-	-	-	922	1436	1266
Midas 98:2 110/220 kg/ha	-	-	1983	1298	1461	-	-	-
Midas 33:67 110/220/390 kg/ha	-	-	2149	1128	1384	1125	1469	1285
Biosolarization with sugar cane molasses and mushroom compost	-	-	-	-	1106	1115	-	-
Untreated	-	-	-	-	932	682	1087	-
*Farms key: “Los Espinos” (LE); “La Huerta” (LH); “El Amescueño” (EA); “Miguel Mariscal” (MM); “Tamandaro” (EFT); “El Sabino” (EFES); “Prosperidad” (RP); “La Calzada” (LC)								