El-Esraa (Nobarya) to 4997±65.32 kg/ Feddan as compared to 1981±80.54 kg/ Feddan during season 2012. During season 2012 the yield loss obtained 56 and 60% in El-Esraa (Nobarya) and El-Kassaseen (Ismailia)which decreased to 22 and 22% in borth corresponding regions (Table 6). The same results obtained during season 2013. The yield weight were significantly increased to 5875± 34.35 Kg/feddan in El-Esraa (Nobarya) as compared to 1999± 36.81Kg/feddan in the control. In El-Kassaseen (Ismailia) the yield were significantly increased to 5997±65.31Kg/feddan as compared to 1791±80.44Kg/feddan in the control. The yield loss ranged between 70 and 35% (Table 7).

Gindin *et al.* (2006). Despite the observed susceptibility of all the development stages of the RPW to the entomopathogenic fungi under laboratory conditions, the practicability of achieving efficient control of RPW in the field seems problematic. The field efficacy of entomopathogenic fungi toward various pests depends on many factors, often related to the behavior of the insect host in its natural habitat. The soil is the natural habitat of fungi and, since the RPW pupae occasionally inhabit the soil, it is theoretically possible to infect them with fungal spores by soil treatment. The spraying of palms and of large areas between them to ensure contact between free living adult RPW and fungal spores also presents a difficulty, because of the large fungal inoculum needed. The best strategy would be to treat only selected areas that are especially likely to attract adults. Adult weevils are usually cryptic, taking refuge between petioles and offshoot bases. They are highly attracted to wounds in palm trees, e.g. that are infected during vegetative production practices that include the removal of offshoots Furlong and Pell (2001) . These areas are often the most attractive sites to females for oviposition and, therefore, may be the best candidates for treatment with a dry fungal formulation. The possibility of infecting the Rhynchophorus adults by this method was discovered by chance, after application of a rice-based formulation of *M. anisopliae* against the *Scarabaeid Scapane*saus tralis on young palms in New Guinea (Prior,.and Arura, (1985). The treatment of frond axils with this formulation caused infection not only to the target pest but also infected some incidental infection on *R. bilineatus*. The high mortality of adults to dry spores of a selected isolate indicates that there was proper contact between fungi and ovipositing females. Hydrophobicity of fungal spores could play a significant role in the success of the dry rice formulation. The attachment of a fungal spore to the cuticle surface is the initial and thus a crucial event in the establishment of mycosis (Boucias, *et al* 1998). The spores of *M. anisopliae* possess an outer layer composed of interwoven fascicles of *hydrophobic rodlets*, which provided the adhesion to the insect cuticle due to non-specific hydrophobic forces (Boucias, *et al* 1998). Thus, similar to the natural infection process, the application of dry spores could provide better adhesion relative to application of aquatic spore suspension. Ideally, we would like to use artificially inoculated females as vectors of infection to their progeny via egg contamination during oviposition. However, in the present study we were unable to prove that such infection transfer occurred. We believe that the lack of success was due mainly to insufficient inoculum transferred by females to eggs. It is possible that this problem is connected with spore hydrophobicity. This character may interfere with fungus transfer from female hydrophobic surface to the egg under humid conditions during oviposition into the plant tissue. The mechanical transfer of fungal spores between the oviposition sites and even further into the oviposition tunnels would be possible, provided that a suitable fungus formulation could be developed. In light of the high susceptibility of eggs and larvae to fungal infection, we assume that in such a case the contamination of eggs and of the larval habitat would add to the effectiveness of this pest control method. The economic effects resulted from using different pesticides to get control the palm weevil *R. ferrugineus.* The cultivation of date palm spreads in most of the Egyptian governorates as the cultivated land estimated 88. 000 fedans which have 16 million palm trees out of which 12 million palm trees annually produce 1.3 million tons of dates [(1)]. The palm tree number in one fedan estimates 200-500 kg of the good sorts such as the sort of Barhi [(2)]. A tree palm production ranges from 100 to 120 kilo per a fedan in the case of currently well-known sorts as the tee palm valued $100-150 US Dollars [(3)]. The study of the economic effects resulted from using different pesticides requires investigating that effect at the farming level to determine the added value of using the pesticides and studying that effect at the national level

First: the effect of using different pesticides at the farming level:

Table 8 shows that the cost of fedan using different pesticides to combat palm weevil estimated about L.E. 400/fedan. The pesticide cost per a palm tree estimated about L.E. 6.1 on the basis that a fedan contains 66 palm trees. The study indicated that the production waste rate reduced to about 17% and 26% in relation to the first pesticide. This rate reduced to almost 18% and 25% as to the second pesticide in the areas of Ismailia and Nobaryia respectively as shown in Table 6. In addition, table 8 shows the production waste reduction had contributed to the increase of palm tree production by about 10, 7, 17 and 8 kg. The increase value palm tree expected return and net return by about L.E. 20, 14, 34, and 16 and almost L.E. 13.9, 7.9, 27.9 and 9.9 for both first and second pesticides in the two areas of study as shown in Table 8. The study of the added value of using different pesticides indicates that the pound return spent on different pesticides cost estimates almost L.E. 2.28, 1.30, 2.93 and 1.62 respectively for the first and third pesticides in the two areas of study as shown in Table 8.

Second: The effect of using different pesticides at the national level:

The study of this effect necessitates the overgeneralization of using the different referred to pesticides at the national level which is expectedly leads to the crop production increase at the domestic level as shown in Table 9.

Table 9 indicates that the state adoption of generalizing the use of pesticides to combat the palm weevil at the republic level will lead to production increase by , 0.348, 0.435, and 0.496 million tons after deducting the Table- referred to waste rate for the first and third pesticides in Ismailia and Nobarya respectively. This increase can save to the state a good yield of foreign currency that contributes to revive the

Egyptian economy, particularly after the collapse of the Egyptian economy in the post period of January, 25 revolution in the case of being world-market exporting oriented. This entails chemicals would not be used in the production of different crops. In the case of exporting, the production increase will contribute to save about $ 284, 362, 452 and 516 million Dollars. This will help lessen the deficit rate on the Egyptian trade balance in the case of generalizing the use of the first and third pesticides as shown in Table 9. The aim of this study is the dominancy of Egypt on world dates exporting and will replace Iraq in this industry prior the industry collapse in Iraq after Iraq's invasion in 2003.

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Table 1: Effect of the isolated fungi *L. lecanii* (1)on the Palm weevil *R. ferrugineus* biology

Pathogen	LC50 (spores/ml)	slope	variance	95 % confidence limits
1st	210	1.1	2.3	200-344
2nd	244	0.2	1.4	222-288
3rd	236	1.1	0.3	234-288
4th	207	0.3	1.5	231-289
5th	200	1.2	1.3	267-300
Adults (♀)	316	2.0	1.8	299-323
Adults (♂)	305	0.1	1.1	289-332

Table 2: Effect of the laboratory isolate(2) fungi *L. lecanii* on the Palm weevil *R. ferrugineus*

Pathogen	LC50 (spores/ml)	slope	variance	95 % confidence limits
1st	210 X 10^4	1.1	1.3	121-298
2nd	280 X 10^4	0.2	1.2	121-299
3rd	270 X 10^4	1.1	0.1	131-380
4th	267 X 10^4	0.3	1.4	140-399
5th	241X 10^4	1.2	1.3	209-398
Adults (♀)	350 X 10^4	2.0	1.4	200-321
Adults (♂)	321 X 10^4	0.1	1.1	189-341

Table 3: Effect of the laboratory isolate (3) fungi *L. lecanii* on the Palm weevil *R. ferrugineus*.

Pathogen	LC50 (spores/ml)	slope	variance	95 % confidence limits
1st	251 X 10^4	1.1	1.3	221-297
2nd	275 X 10^4	0.2	1.2	210-299
3rd	288 X 10^4	1.1	0.1	210-390
4th	372 X 10^4	0.3	1.4	240-399
5th	381 X 10^4	1.2	1.3	290-399
Adults (♀)	355 X 10^4	2.0	1.4	301-348
Adults (♂)	328 X 10^4	0.1	1.1	249-352

Table 4: Effect of the isolate(2) fungi *L. lecanii* on the Palm weevil *R. ferrugineus* eggs

Age	Eggs Hatching %						larval mortality %					
	Isolates(1)		Isolates (2)		Isolates(3)		Isolates(1)		Isolates(2)		Isolates(3)	
	T	C	T	C	T	C	T	C	T	C	T	C
Newly	0	100	1	99	11	00	3	100	2	100	4	100
Two days old	9	100	3	99	31	00	3	100	2	99	3	100
Three days old	12	99	10	100	11	99	3	100	3	100	2	99
Four days old	20	100	18	100	13	99	6	100	7	100	2	99

T. treated C. control (untreated)

Table 5: Effect of the fungi *L. lecanii* three isolates on the Palm weevil *R. ferrugineus* biology.

Treatments	%Larval mortality	% of malformed pupae	pupal mortality	% of moth hatching
Control	1	0	0	100
L.l isolate(1)	87	71	53	10
L.l isolate(2)	97	50	84	4
L.l isolate(3)	88	55	75	7

Table 6: Weight of harvested palm and percentage of yield loss after treatment with the fungi *L . lecanii* against *RPW* during seasons 2012 in two different regions.

Treatments	El-Esraa (Nobarya)		El-Kassaseen (Ismailia)	
	Weight palm (Kg/feddan)	% yield loss	Weight palm (Kg/feddan)	% yield loss
Control	2000± 36.82	56	1981±80.54	60
L.l Isolate(1)	3123± 41.20	26	3345± 40.30	33
L.l Isolate(2)	4560± 34.31	-	4997±65.32	-
L.l . Isolate(3)	3531± 42.57	22	3879±69.33	22
F values	31.22		32.11	
LSD 5%	92		90	

Table 7: Weight of harvested palm and percentage of yield loss after treatment with the fungi *L. lecanii* against RPW during 2013 in two different regions .

Treatments	El-Esraa (Nobarya)		El-Kassaseen (Ismailia)	
	Weight palm (Kg/feddan)	% yield loss	Weight palm (Kg/feddan)	% yield loss
Control	1999± 36.81	65	1791±80.44	70
*L.l*Isolate(1)	3003± 32.40	48	3113± 42.50	48
L.l . Isolate(2)	5875± 34.35	-	5997±65.31	-
L.l Isolate(3)	3473± 42.50	40	3892±69.73	35
F values	33.02		30.30	
LSD 5%	84		80	

Table 8: The added value of using different pesticides to combat palm trees weevil at the farming level

The net of return/cost in pounds	the net of expected return/palm tree in pounds	The expected return/palm tree in pounds	Increase of production/palm tree kg	The cost of using pesticide/palm tree in pounds	The cost of using pesticide/fedan	pesticide	Area
2.28	13.9	20	10	6.1	400	M.a Isolate(1)	Ismalia
1.30	7.9	14	7	6.1	400	M.a Isolate(1)	Noubaria
2.93	27.9	34	17	6.1	400	M.a . Isolate(3)	Ismalia
1.62	9.9	16	8	6.1	400	M.a . Isolate(3)	Noubaria

Source: computed and collected from Tables 6 & 7.

Table 9: The economic effects resulted from the overgeneralization of using different pesticides at the national level:

Expected exporting value (US Dollars)	Ton exporting price (US Dollars)	Expected increase in production (million tons)	Waste amount (million tons)	% of harvest waste	Expected increase in production (million tons)	% production increase	Production (million tons)	pesticide	Area
284	1040	0.273	0.243	47	0.516	38	1.359	M.a Isolate(1)	Ismalia
362	1040	0.348	0.223	39	0.571	42	1.359	M.a Isolate(1)	Noubaria
452	1040	0.435	0.095	18	0.530	39	1.359	M.a . Isolate(3)	Ismalia
516	1040	0.496	0.061	11	0.557	41	1.359	M.a . Isolate(3)	Noubaria

Source: computed and collected from FAO and Tables 6 & 7.