

Olive Fly (*Bactrocera Oleae* Gmelin) MANAGEMENT WITH NEW ALLOWED FORMULATIONS, SATISFYING THE OLIVE OIL QUALITY REQUIREMENTS

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Abstract: The efficacy of the new biopreparates and traps to control olive fruit fly, *Bactrocera oleae* Gmelin, field infestations was investigated in Vlora (eastern part of Albania). The preliminary results showed that fruit infestation levels were significantly reduced on "neobordolez" (Bordeaux mixture with kaolin)- treated trees compared with untreated trees. In Tirana region (central part of Albania) it has been studied the bionomy of *Bactrocera oleae* Gmelin to optimize the time of treatment. The promising results of these experiments points to the feasibility of using these new biopreparates to control olive fly damage as significant alternative in organic orchards. Finally, these treatments showed unaffected the nutritional and sensory quality parameters of the corresponding virgin olive oils obtained by ISUV (Institute of Veterinary and Food Security), Eurofins and BIOL prize laboratories thus satisfying the present quality requirements.

Key words: *Bactrocera oleae*, bionomy, olive, olive oil quality, neobordolez

I. Introduction

The study focuses on practical actions to achieve its goals and especially in use of best practices in olive grove in order to reduce the fruit infection levels from the Olive fly (*Bactrocera oleae* Gmelin), which is the key pest of olives in Albania and in most cultivars develop each year high population and the infection level reaches up to 99%, meanwhile the losses, in fact, about 30% of olive lost has been evaluated owing its attack (Weems and Nation, 2003). Damages are due to the quantitative lost such as premature fall of the fruit and the pulp destruction by grub and qualitative lost such as increases of the acidity of the olive and as the consequence the acidity of the olive oil. In the oil there is an increase of the peroxides and the decrease of the poly phenols together with other actions which highly influence the quality of olive oil. In table olives the oviposition, destroy the value of the fruit.

Furthermore, being aware that cooper is used to manage the Olive fly in organic groves, but it use is also restricted, this study has been undertaken as an alternative for other products that should be utilized. This work carried out in 2010-2011 on the *Bactrocera oleae* Gmelin bionomy in the Tirana region and the use of biopreparates and new traps for its management in Vlora and the main cultivars have been studied. Program aim also in building up an integrated strategy of impact evaluation on agro ecosystems with main goal on reducing the chemical inputs and better control of olive fruit fly in order to satisfy the required quality of olive oil.

II. Materials and Methods

Insect populations have been monitored through recorded biological and climatic data. These data have been collected in real time for adults and larval stages. In order to manage the optimal results for the damage to the crop the monitoring of adults of *B. Oleae* in traps and observations of larval stages in fruit samples are coupled with climatic data.

The attractants such as ammonium salts or protein hydrolysates have been used to monitor adult populations of the olive fly and the activity of *B.oleae* has been studied through traps such as the McPhail in Tirana region and OLIFE traps with juniper extract attractive and ammonium bicarbonate in Vlora region. The distance of attraction of such traps however is not very great and in general does not go further than the immediate surroundings of the tree in which it is suspended and for this reason the trap usually has a very low trapping efficiency (Delrio, 1985). For that reason the captured fruit fly have been monitored every week (same day& same time/day/1week).

Olive Fly (*Bactrocera Oleae Gmelin*) MANAGEMENT WITH NEW ALLOWED FORMULATIONS

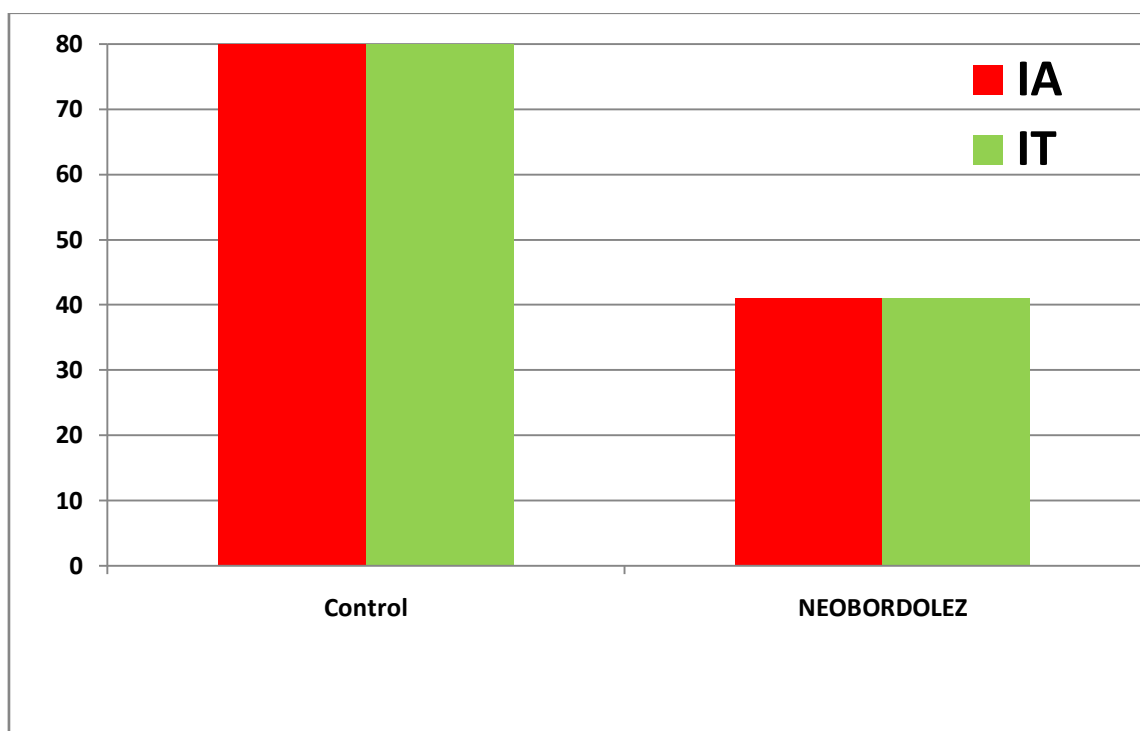
The sample is taken in 50 olive trees by 2 olive fruits per tree, avoiding the plants situated in the margin of the grove. For each sample, all stages of pest development (eggs, sterile punctures, I, II, III instars larvae both alive and not, pupae and also perforations were analyzed and the total amount gave the active infestation (IA) and total infestation (IT) rate.

In Vlora region, Olive traps with 4 different attractants (1. *Juniperus* extract; 2. fish flour; 3. hydrolyzed protein and 4. ammonia bicarbonate) was used to monitor the efficacy against olive fly.

Also, biopreparates are tested in Kalinjot cultivar. In 2010 and 2011 was used NEOBORDOLEZ (Bordeaux mixture with kaolin). This biopreparate gave the best result combined with selected OLIVE traps in order to optimize the efficacy for high populations of the olive fruit fly.

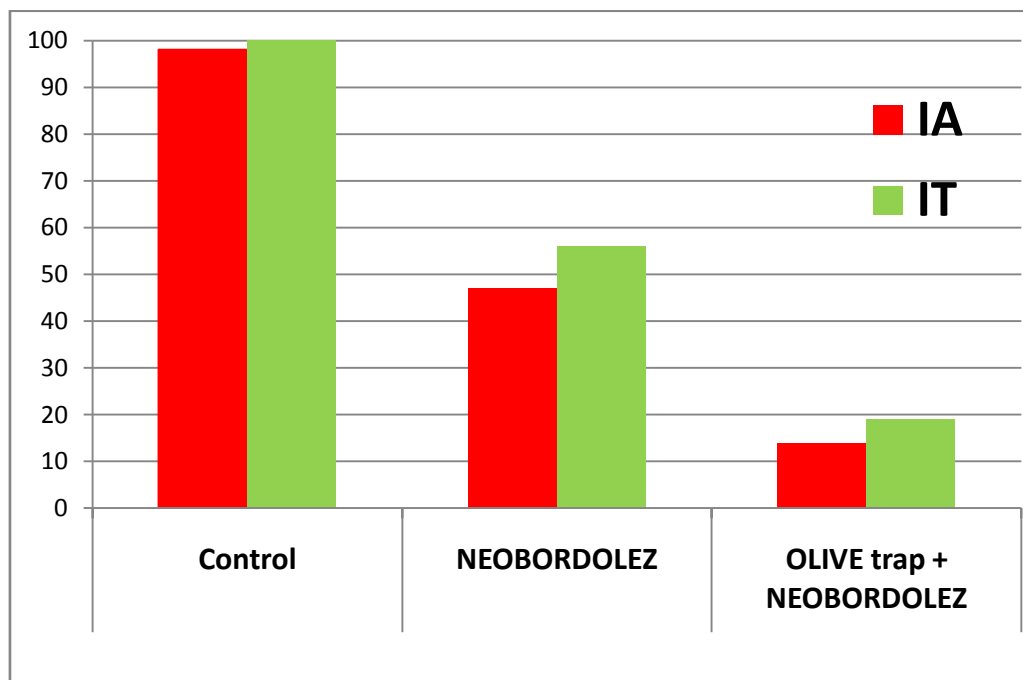
The olives were treated with Neobordolez which is composed of copper sulphate and lime water. This biopreparat has improved properties by the addition of bentonite (clay) up to 2% and contains a lower percentage of copper per hl.

Graph 1. Infestation percentage (IA dhe IT) of olive fruit fly (*Bactrocera oleae* Gmelin) in Kalinjot cultivar. ACTT Vlora, 2010.



In 2011, a year characterized by low production and high infestation by olive fruit fly in general olive growing areas in Albania, tests focused in evaluating the efficacy of the combination OLIVE traps and NEOBORDOLEZ product that in 2010 give the best result among biopreparates. Also, OLIVE trap and NEOBORDOLEZ alone were sampled in order to compare the result with the combined strategy. Result shown that the combined effect of traps and spraying treatment gives a very high control of the infestation compared with the control plot, while traps and biopreparat alone give some similar result in terms of percentage. For the high quality olives and extra virgin olive oil of high quality the combined method of management justifies considering the cost and the long term sustainability of the grove.

Graf 2. Active (IA) and total (IT) infestation (in %) of Kalinjot olives. ACTT Vlora, 2011.



III. RESULTS AND DISCUSSIONS

Olive fruit fly (*Bactrocera oleae* Gmelin) remains a serious problem in olive sector, while in both years (2010 – 2011) has developed high population and infestation rate that exceed 95% in control plot. Kalinjot cultivar has not shown significant differences in terms of infestation rate by pest (in proximity of the harvest moment).

OLIVE traps have shown very good result, nevertheless, this method should be integrated with other agronomical and chemical techniques since in years where fly population is high by favorable factors, infestation overcomes the economic threshold for this pest.

Early harvest, also, should present a key method in harvesting high quality olives and assuring the raw material for a high quality extra virgin olive oil. Table shows brief results of the efficacy of OLIVE traps evaluation expressed in active (IA) and total (IT) infestation rate. These are the results taken in proximity of the harvest, moment where infection reaches high level and we observe differences between several plots treated.

The olive oils were analyzed by EU Official Methods (EC Reg. N0 2568/91) from the control plots and after treated plots. The analyzes have shown no significant differences in the quality of olive oil and mostly in the nutritional and sensory quality parameters of the corresponding virgin olive oils obtained by certified laboratories, thus satisfying the nutritional and sensory quality requirements.

Table1. Olive oil quality parameters

	neobordolez	control
Delta K	- 0,001	-0,002
K 232	1.451	1.462
K 270	0,071	0,089
Peroxide index	6	6
Free acidity	0.1	0.18

fig.1 The sensory profiling of olive oil from control olives (Kalinjot cultivar)

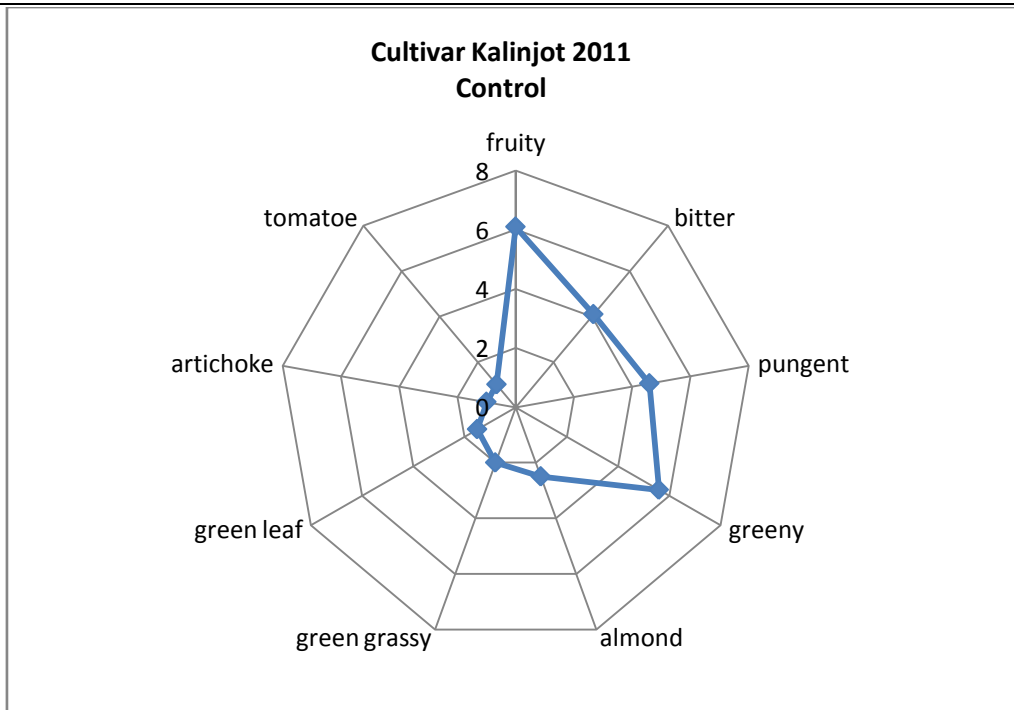
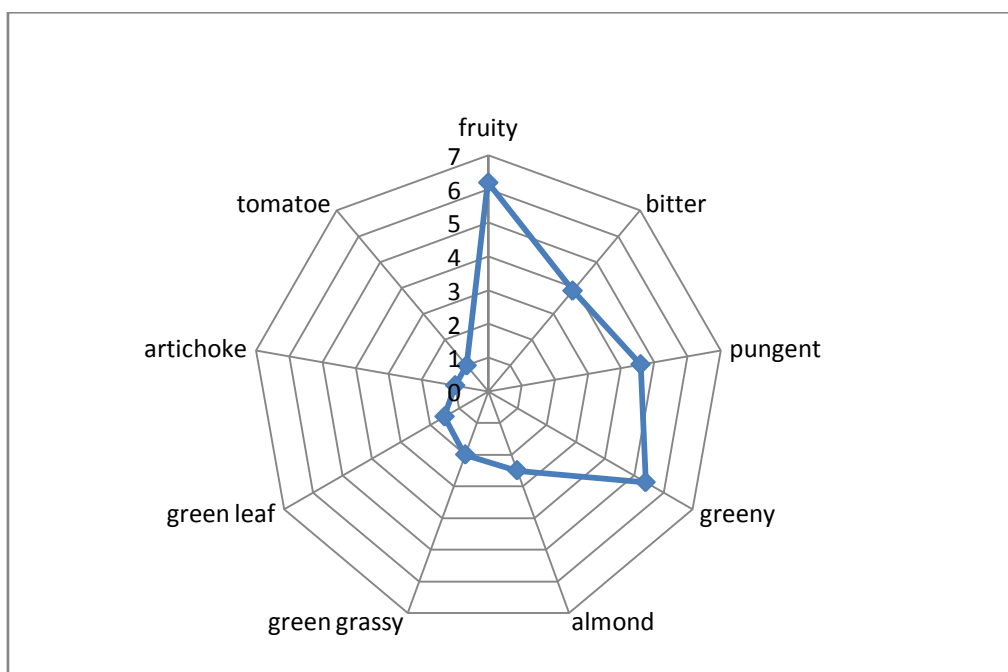


fig.2 The sensory profiling of olive oil from neobordolez treated olives (Kalinjot cultivar)



IV. CONCLUSIONS

These tests showed a satisfactory efficacy of OLIVE traps used and biopreparates on the olive fly control as a key pest of olive. The most effective traps were those with juniper extract attractive and ammonium bicarbonate, which we think are ready for recommendation for production and wide application. Among the tested Bio-products (preparates), Neobordolez gave better results as compared to the untreated trees (control) and other market products (preparates), which are permitted for use in biological production conditions.

However, in years where the population of pests is expected to be high or in very susceptible cultivars, in irrigated conditions and for those extra-virgin oil quality producers who emerging market with significant

quantities, the implementation of both these methods (bio preparates + traps) would be the best strategy that will ensure maximum results, comparable to those of synthesis preparations (products) such as dimethoate.

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