

Without Insecticide Sprays, Damage from Insect Feeding Would Lower the Quality of European Olive Oil

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Leonard Gianessi and Ashley Williams

More than 95% of the world's production of olive oil (about 870 million gallons) comes from the Mediterranean region. The olive fly is an ancient pest mentioned in Greek and Roman writings dating back to the 3rd Century B.C. The larvae of the olive fruit fly feed exclusively on olive fruits. Each female may lay 200-250 eggs, usually one per olive, right below the surface of the fruit [1]. In heavily infested orchards more than 90% of the olives may be attacked [2]. The larva starts feeding and burrowing into the pulp for about two weeks and then makes a hole in the fruit to exit. There are from four to six generations each year.

If control measures in the form of insecticide sprays are not made, up to 40% of production can be lost [3]. Attacks in the summer and fall cause a premature fruit drop of olives, which are lost for harvest. The larvae consume pulp which results in a reduction of oil quantity by 20-25%; the quality of the oil is also lowered [4]. Oil obtained from olives infested with the olive fruit fly has 50-60% higher acidity [5]. Exit holes made by larvae allow for the development of bacteria and fungi [3]. Acidity is increased by fermentation through the action of bacteria and fungi and oxygen exposure [4]. The reduction of phenolic concentration in oils from olives attacked by olive fly ranges from 34-49% [6]. When phenols decrease, the stability of the oil is compromised. The larval gut contents may have an effect on the flavor of the oil and lead to a so-called "wormy smell" [4].

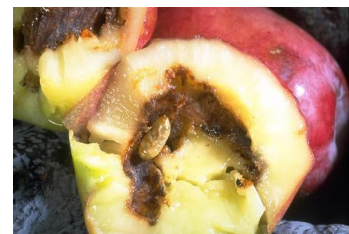
Damage by olive fly can be reduced by harvesting early to avoid the massive attacks in late autumn. This practice was imposed by law by Napoleon I in the last century [7]. Beginning about 1900 bait sprays of molasses and arsenic were applied against the olive fly. In the 1960s, the availability of inexpensive chemical insecticides made it possible to protect the olive crop efficiently from the olive fly [7]. The current standard control method is the application of bait sprays which include a mix of an attractant and insecticide sprayed directly on the foliage of olive trees which are targeted at killing the adult flies prior to egg deposition. Feeding is not required for fly killing, as death results from its contact with the insecticide of the bait [8]. Area-wide management is a must for success due to the mobility of the flies. Several countries such as Spain and Greece have government-sponsored programs that provide area-wide spray programs.

References

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Olive fruit fly



Olive fruit fly pupa inside olive



Decay and feeding damage from olive fly