

COCKROACH MANAGEMENT, A MUNICIPAL APPROACH. CITY OF MADRID (SPAIN)

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Abstract Urban pest management in Spain, which involves prevention and control, corresponds to the municipalities. The data, key elements and conclusions of a continuous analysis of 10 years of the Madrid Municipality pest control program against sewer system cockroaches (*Blatta orientalis* and *Periplaneta americana*) are presented. Although most resources are focused on inspection and treatment of the municipal sewage system, integrated cockroach management requires other additional areas of work: (1) Information, education and citizen's responsibility; (2) Careful, continuous monitoring and treatment plan of the municipal sewer system; (3) Powerful data collection and integrated management of citizen complaints; (4) A comprehensive and well-designed action plan including environmental city monitoring to manage cockroach habitats; (5) Specific measures against *Periplaneta americana*, 'foreign' insect in Madrid but with increasing distribution in Spain and other Mediterranean countries in recent years; (6) Data management using the Geographic Information System tool of the city of Madrid; (7) Strengthen the research and collaborations with University and other research institutions; (8) Strong cooperation with pest control companies in the city. Overall, the continuous data analysis along the last 10 years has shown a decrease for the whole city (real citizen complaints). City districts revealed similar behaviour, only four of the twenty-one City Districts had experienced a very slight increase of the number of citizens' complaints (year 2016) with respect to the previous year 2015, but still showed a very strong and continuous decrease trend for the 10-year-period (-25,44 % reduction average; -17,82 to -36,16). Focusing on *Periplaneta americana*, data showed an increase in the last four years, the number of interventions in 2016 were 136 % higher than in 2015. Data analysis conclusions: (A) The sewer cockroach prevention and control require a strong involvement of municipal departments and resources. (B) Citizen's commitment and involvement in their private areas are critical. (C) It is necessary to implement new and effective application techniques and products in the sewer system compatible with chemical and environmental safety (i.e. effective and affordable baits). As a result, the application of these global approach procedures in Madrid Municipality, according to program indicators, has reduced notably cockroach infestation. Banning of conventional insecticide spraying practices in the Municipal sewer system has avoided the dispersion of cockroaches to alternative sewer system habitats (i.e. municipal or private subterranean infrastructures, etc.). (D) *Periplaneta americana* is the cockroach species with higher growth potential, therefore a strategic proactive plan to control and avoid the colonization of new areas must be designed and implemented as soon as they are detected or suspected. In this respect, the cooperation between municipal administrations and private property and pest control companies are entirely crucial.

