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**CURRENT SITUATION OF THE SURAMERICAN FLY OF THE CUCURBITACEAS
Anastrepha grandis, IN THE REPUBLIC OF PANAMA.**

BACKGROUND:


The South American fly of the Cucurbitaceae, *Anastrepha grandis* is a highly restrictive pest for the international trade of cucurbit fruits (melons, watermelons, pumpkins and cucumbers), mainly for the North American market.

In Panama it was detected for the first time in the province of Darién and in the district of Tortí, district of Chepo in the province of Panama, in February 2009, through the Phytosanitary Surveillance System of the National Directorate of Plant Health (DNSV) of the Ministry of Agricultural Development (MIDA), which led to the international notification of the pest, taking into consideration the provisions of the International Standards for Phytosanitary Measures (ISPM) No. 17 "Notification of Pests" and ISPM No. 8 "Determination of the Situation of a Plague in an Area".

Faced with this contingency and as dictated by the global technical procedure, a Phytosanitary Emergency Plan was structured and applied, which included the application of phytosanitary measures such as: (i) Operation of internal quarantines in the communities of Agua Fría and Chepo, to restrict the movement of cucurbitaceous fruits in general and thus reduce the risk of dispersion of the pest to the rest of the country (ii) Repopulation with more official traps (used for detection in phytosanitary surveillance of the pest) in sites with positive captures (iii) Expansion and strengthening of the phytosanitary surveillance system for fruit flies at the national level (iv) Application of selective insecticides for pest control in the vicinity of official traps with positive captures (v) Fruit sampling for the detection of larval stages (vi) Training and dissemination.

During the period from 2009 to 2012, the phytosanitary measures developed focused specifically on the phytosanitary surveillance of the pest, the application of selective insecticides for fruit flies in sites and communities with positive catches of *A. grandis*; as well as the search of the reproduction site of the same, by means of intensive sampling of cucurbit fruits, to determine the host plant and thus direct or focus the control strategies.

The fruit sampling actions involved commercial crops, wild cucurbits, public markets, vegetable and fruit sales stalls, restaurants, landfills, among others; In

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addition to the application of surveys and interviews with producers, housewives, intermediaries and marketers of fruits and vegetables. Simultaneously, interceptions and seizures were made at the mobilization control posts of the Executive Directorate of Agricultural Quarantine (DECA).

It is estimated that the effort made during this period involved the revision of more than 12,000 kg of fruit, all with negative results in the presence of immature stages of the pest.

On March 8, 2012, after 3 years of searching, technicians of the National Fruit Flies Program (PNMF) detected in the community of El Tirao, Santa Fe district, Darién province, larvae of *A. grandis* in fruits of the wild plant *Fevillea cordifolia*, belonging to the cucurbitaceae family.


From the beginning, MIDA established and maintains strategic alliances with the Regional International Organization for Agricultural Health (OIRSA), the International Atomic Energy Agency (IAEA), the Department of Agriculture of the United States (APHIS-USDA), the Autonomous University and Mechanics of Florida and the Vice-rector of Research and Postgraduate of the University of Panama.

DEVELOPED ACTIONS AND TECHNICAL JUSTIFICATION

Based on the identification of *F. cordifolia*, as the host plant and breeding site of *A. grandis*, as of 2014 and within the framework of a MIDA-OIRSA project, a control strategy was structured and put into operation, which includes the search for *F. cordifolia* plants, taking as initial reference, 23 communities that, during the previous 7 years of work, reported positive catches of *A. grandis* in installed official traps.

Another criterion used was the plant-host relationship and its ecological niche, associated with the margins of rivers and streams; besides being a climbing plant that monopolizes one or more support trees, with altitudes that go from the ground level to more than 20 m. Tall. The phenology of the plant, characterized by two fruiting per year, was also taken into consideration. The first and most abundant during the months of April to June and the second fruiting during the months of October to January (Euceda, X. 2014).

Based on the above, a search was made in rivers and streams located in the province of Darién and in the district of Chepo; as well as in other provinces such

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as Chiriquí, Los Santos and Colón; where there were previous reports of the presence of the host plant, according to information provided by the Herbarium of the Faculty of Biology of the University of Panama.

An inventory of 180 geo-referenced sites with the presence of *F. cordifolia* was developed, in which several control measures have been applied, such as: installation of 720 permanent bait stations with Cera Trap®, systematic spraying of GF-120- NF-Naturalyte®-02%; both directed to adult control of *A. grandis*. In addition, the collection and periodic destruction of fruits for the elimination of eggs and larvae.

The control actions carried out at *A. grandis* breeding sites are considered effective, since the catches in the official traps have diminished markedly in comparison with previous years, as can be seen in the tables, graphs and images they are presented below.

Table No. 1: Historical summary of catches of *A grandis* in Chepo

Year	Traps in operation	Traps with positive captures	Total of captures	No. de communities	Communities involved
2009	269	8	36	6	Quebrada Cali, Río Seco, Partí, Río Rubén, Higuaronal Centro, San José
2010	273	0	0	0	No captures
2011	212	5	10	3	Piriatí, Quebrada Cali, Río Seco
2012	183	6	7	4	Quebrada Cali, Wuagandí, Tortí y Ipetí Choco
2013	207	8	9	1	Quebrada Cali
2014	184	0	0	0	No captures
2015	184	0	0	0	No captures
2016 *	184	0	0	0	No captures

(*)According to data corresponding to the period January - April 2016


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Table No. 2: Historical summary of catches of *A. grandis* in Darién

Year	Traps in operation	Traps with positive captures	Total of captures	No. de communities	Communities involved
2009	552	25	87	17	Agua Fría Nº 1, Agua Fría Nº 2, Arenal, Arretí, Canglón, Cupudo, El Tirao, Emberá Phuru, Entrada Palmira, La Cantera, La Moneda, Nuevo Progreso, Quebrada Cañazas, Quebrada Honda, Santa Fe, Vista Alegre, Zapallal.
2010	763	2	2	2	Agua Fría , Quintín
2011	808	31	54	15	Agua Fría, Agua Fría Nº 1, Agua Fría Nº 2, Chepigana, El Tirao, Emberá Phuru, Hacia Sabana, La Cantera, Quebrada Muerto, Quintín, Santa Fe, Setegantí, Vigía.
2012	514	31	153	14	Agua Fría, Agua Fría Nº 1, Agua Fría Nº 2, Arenal, Arimae, Bejucal, El Balsal, El Tirao, Emberá Phuru, Hacia Sabana, Pueblo Nuevo, Quebrada Cañazas, Santa Fe, Setegantí.
2013	520	22	104	10	Agua Fría, Agua Fría Nº 1, Agua Fría Nº 2, Arimae, El Tirao, Emberá Phuru, Hacia Sabana, Nuevo Progreso, Santa Fe, Punta Grande.
2014	459	29	89	16	Agua Fría, Altos del Cristo, Arimae, Arretí, Buenos Aires, Calle Larga, El Balsal, El Tirao, Emberá Phuru, La Lomita, Pueblo Nuevo, Quebrada Honda, Quebrada Muerto, Santa Fé, Vista Alegre, Zapallal.
2015	466	7	20	4	Agua Fría, Arimae, El Tirao, Emberá Phuru.
2016 *	466	0	0	0	Nocaptures

(*)According to data corresponding to the period January – April 2016



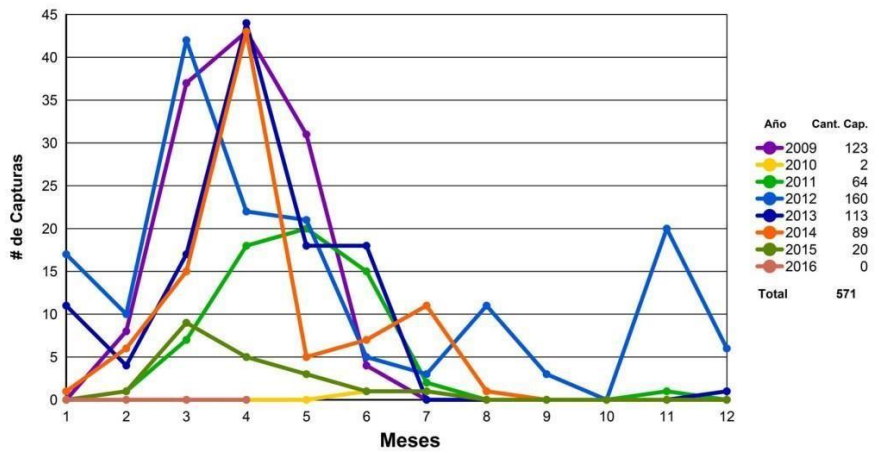
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History of Captures of Anastrepha grandis on Panamá

Historial de Capturas de Anastrepha grandis en Panamá

Desde el 2009 hasta abril 2016

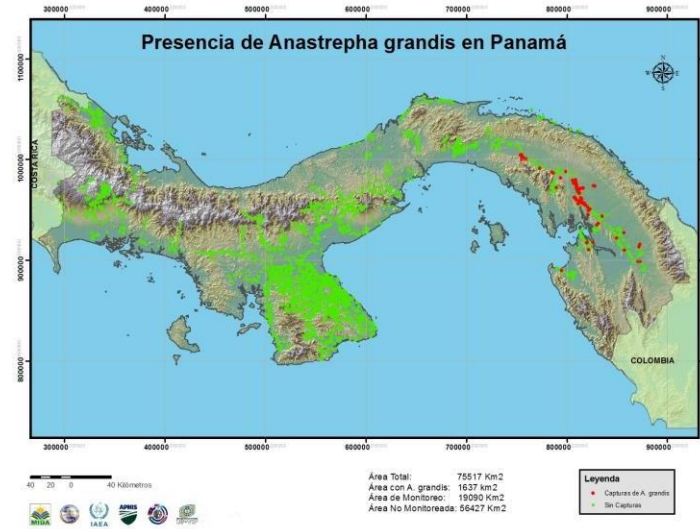


Programa Nacional Moscas de la Fruta

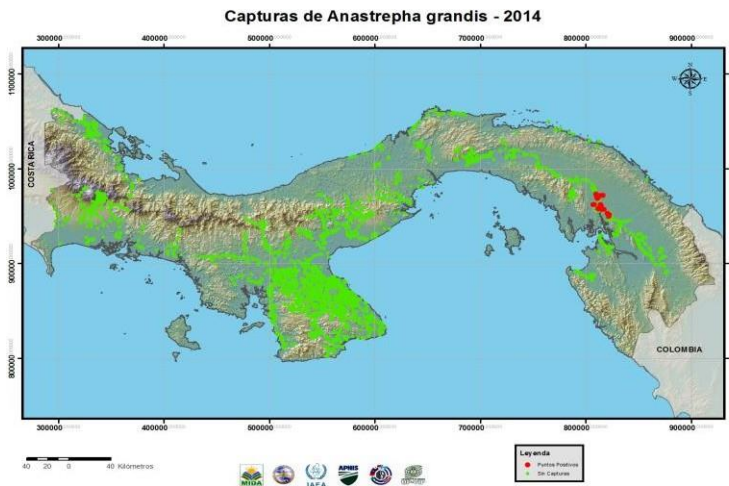


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Presence of *Anastrepha grandis* in Panamá



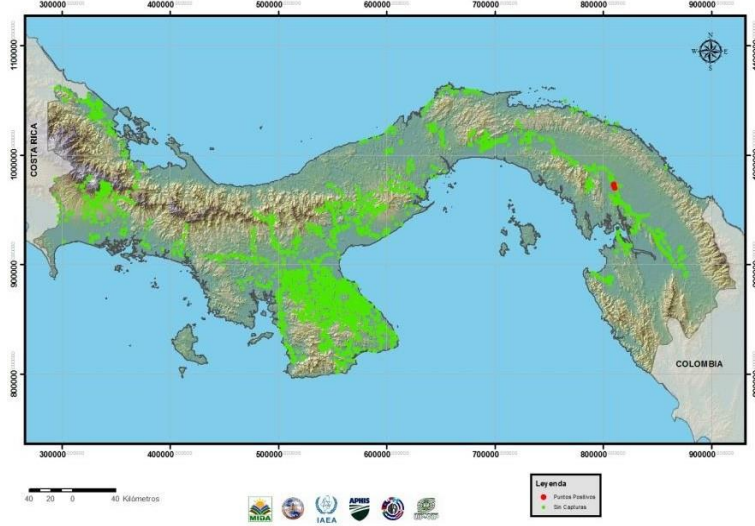
Captures of *Anastrepha grandis* - 2014



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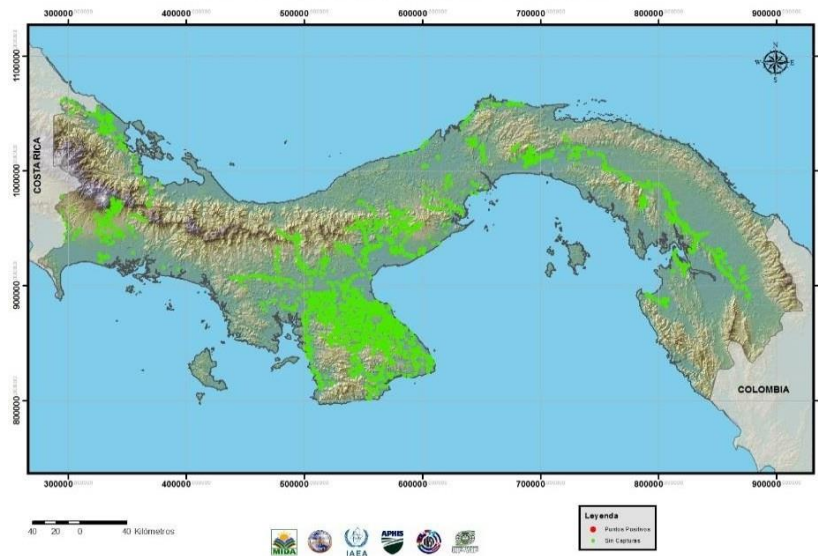
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Capturas de *Anastrepha grandis* - 2015




Captures of *Anastrepha grandis* - 2015

Capturas de *Anastrepha grandis* - Abril 2016



Captures of *Anastrepha grandis* - 2016


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Evidence shows that catches of *A. grandis* in official traps have declined markedly. However, in the bait stations with Cera Trap[®], (artisanal traps) installed and in permanent service as a control measure within the sites with *F. cordifolia*, the catches of *A. grandis* persist. This reinforces the criterion that *A. grandis* populations are closely related to their host plant and consequently it is being used as a trap plant, where control actions are carried out.

The above, coincides with the results of the research carried out by Euceda, X. 2014, who showed that by synchronizing the fruiting in plants of Zapallo (*Cucurbita maximum*) and *F. cordifolia* in natural conditions and exposing the fruits of both plants to wild populations of *A. grandis*, only infested the fruits of *F. cordifolia*.

In the aforementioned work the author concludes that: "The only host of *A. grandis* in the Darien and Eastern Panama area corresponds to the *F. cordifolia* wild plant"


Parallel to the control campaign carried out by the DNSV, in the framework of the MIDA-OIRSA Project for the containment in Panama of the South American fly of the Cucurbitaceae, in the internal quarantine posts of the DECA, the seizures have continued, review and destruction of cucurbitaceous fruits; with negative results to the presence of immature stages of the plague.

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CONCLUSION

Based on the foregoing, it was concluded that:

1. The results of the surveys of *F. cordifolia*, indicate that the plant is only present in the margins of some rivers and streams, from the province of Darién to the community of Quebrada Cali in the Corregimiento of Torti, district of Chepo.
2. The probability that *A. grandis* will spread to the free areas, through cultivated cucurbitaceae fruits, represents a very low risk.
3. The potential risk of dispersion of *A. grandis*, is the transfer of fruits of *F. cordifolia*. However, due to its status as wild fruit, with no commercial or nutritional value, its mobilization risk continues to be significantly low.
4. Sustainability in the control measures currently applied and the search and incorporation of new sites with *F. cordifolia* to such measures; they will contribute in the suppression of the populations of the plague, directly in their niche of reproduction and consequently the risk of dispersion will continue to diminish.

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ACTIONS DONE

1. The restriction measures included in Ministerial Resolution DAL-025- of May 4, 2009, are modified by an equivalent measure that allows the production of cucurbits through the phytosanitary surveillance scheme at the production sites or under the concept of "certified production" by the DNSV, according to a Work Plan, for risk mitigation, according to Resolved No. AOL-040-ADM- April 4, 2017.
2. The transfer of fruits of *F. cordifolia* from the areas of detection of the pest to the rest of the country is prohibited.
3. Phytosanitary surveillance is maintained in order to establish the status of the pest at the national level and inform interested parties.
4. To give sustainability and extension of the control actions in the breeding sites of *A. grandis*, to suppress the populations and consequently decrease the risk of dispersion of the same.
5. A training and dissemination program is structured and developed to sensitize the community in general, about the conservation of the ecological niche of *F. cordifolia*, so that it continues to be used as a trap plant where the controls of the populations of *A. grandis*, within the detection areas. In the same way, the sensitization to avoid the movement of fruits of this plant towards the free areas of the plague.
6. Strategic alliances are established with the government sector and NGOs linked to environmental issues, so that they support and contribute to *A. grandis* control campaigns and the conservation of gallery forests and sites with potential for the development of *F. Cordifolia*.

BIBLIOGRAPHIC REFERENCES.

- EUCEDA, X. 2014. Biological characteristics of *Anastrepha grandis* (Macquart, 1,846) in relation to its natural host, *Fevillea cordifolia* in Darién, Panama. Thesis. Master of Entomology. University of Panama, Panama 132 pag.
- ISPM 8. Determination of the location of a pest in an area. International Convention on Phytosanitary Protection. Rome Italy. 16 pag.