12th workshop of the AMRQC

Mediterranean fruit fly

Review of Eight fruit fly Emergence and Release Facilities

Pedro Rendon*

Mexican fruit fly

Symposium on: SIT applications and other uses of irradiation technology.

*R&D Moscamed Program Guatemala

Expert Review Panel Members:

Pedro Rendon, Chairperson
Jorge Hendrichs
Aldo Malavasi
Ed Gersabeck
Wayne Burnett
Bill Macheel
John Stewart
Pablo Montoya

USE OF STERILE FRUIT FLIES IN PREVENTATIVE (PRP) AND CONTROL ACTIVITIES

- Potential for natural spread from infested areas
- High approach rate of fruit fly host material at ports of entry
- Prevailing climatic conditions that are favorable to establishment of reproducing populations
- Availability of host fruits and vegetables

Eight fruit fly ERFs supported by APHIS and its cooperators in the United States, México, and Guatemala

- Medfly Preventive Release Programs in Los Alamitos, California, and Sarasota, Florida
- Lower Rio Grande Valley Mexfly Eradication Program in Reynosa, Tamaulipas, México and Edinburg (Mission) and Harlingen, Texas
- Mexfly SIT Suppression Program in Tijuana, Baja California, México
- Moscamed (Medfly) Program in Tapachula, Chiapas, México and Retalhuleu, Retalhuleu Guatemala

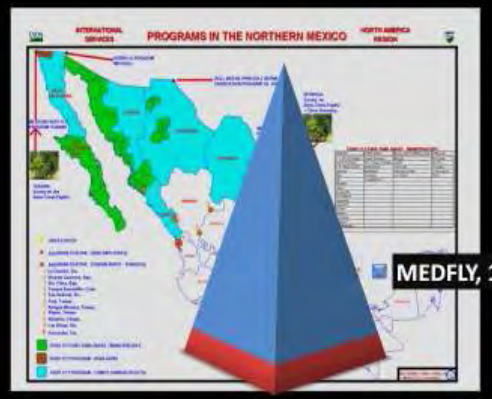
Recommendations in this review were based on

(FAO/IAEA/USDA 2003)

(FAO/IAEA 2007)

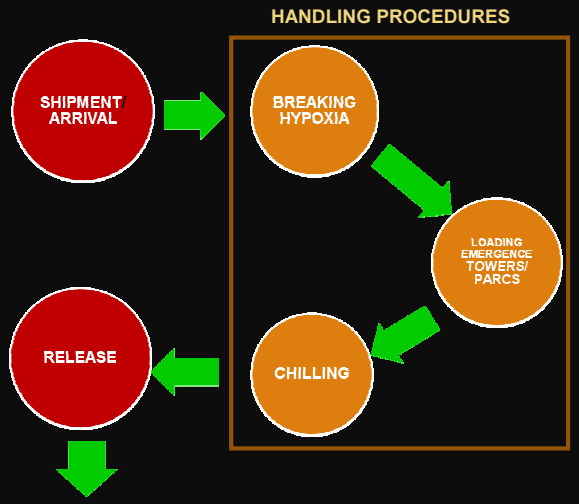
A total of 103 recommendations were put forth by the expert panel

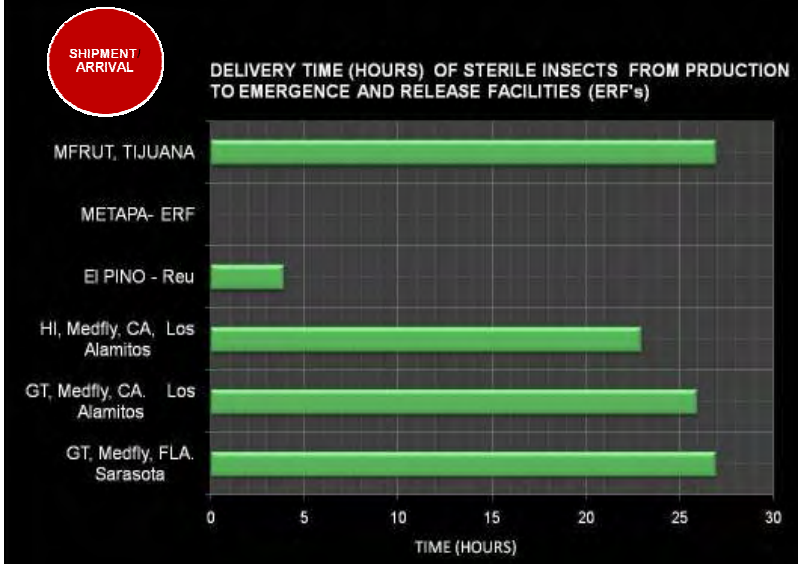
TOTAL AMOUNT OF FLIES: MILLIONS RELEASED/WEEKLY BY EMERGENCE AND RELEASE FACILITIES



- SIT FOR 2 SPECIES OF FRUIT FLIES
- OTHER SIT PROGRAMS – e.g. PINKBOLL WORM
- LARGE AREA = FRUIT PRODUCTION

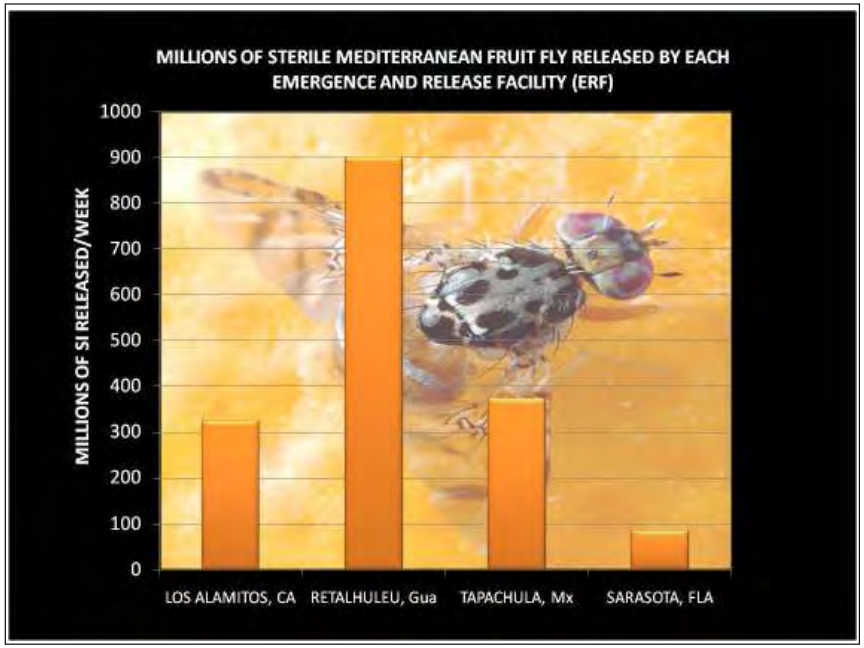
GENERAL PROCESS

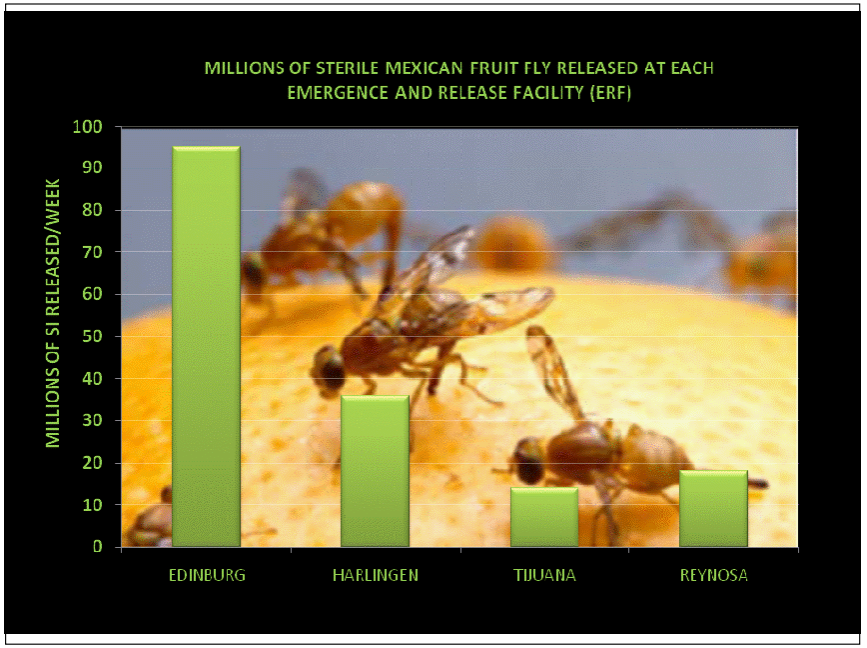




HANDLING PROCEDURES

RELEASE






INTERNATIONAL SERVICES
PROGRAMS IN THE NORTHERN MEXICO
NORTH AMERICA REGION
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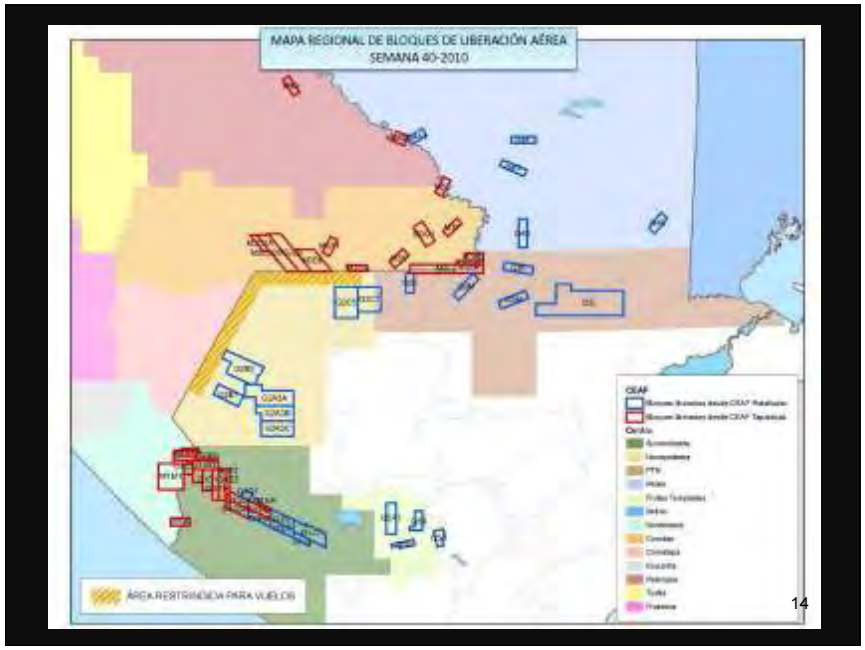
MAPA REGIONAL DE BLOQUES DE LIBERACIÓN AÉREA
SEMANA 40-2010
ÁREA RESTRINGIDA PARA VUELOS
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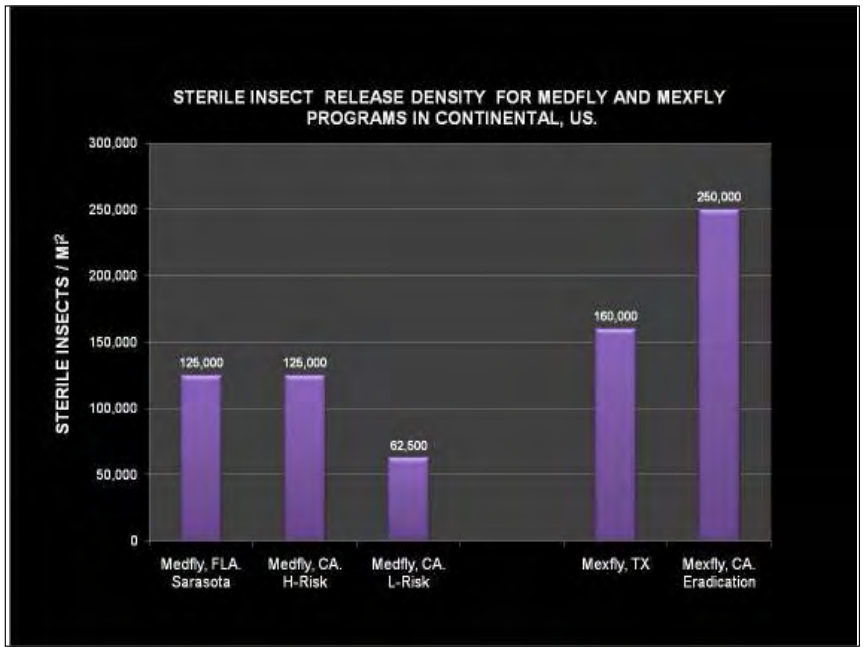
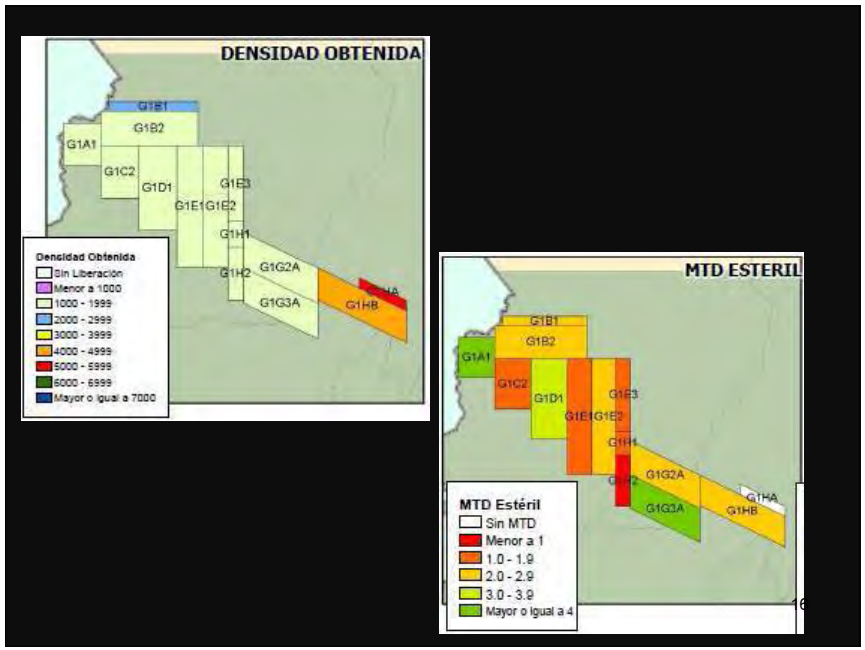

STERILE INSECT RELEASE DENSITY FOR MEDFLY AND MEXFLY PROGRAMS IN CONTINENTAL, US.
STERILE INSECTS / M²
300,000
250,000
200,000
150,000
100,000
50,000
0
125,000
125,000
62,500
160,000
250,000
Medfly, FLA. Sarasota
Medfly, CA. H-Risk
Medfly, CA. L-Risk
Mexfly, TX
Mexfly, CA. Eradication


DENSIDAD OBTENIDA
G1B1
G1B2
G1A1
G1C2
G1D1
G1E3
G1E1
G1E2
G1H1
G1H2
G1G2A
G1G3A
G1HB
Densidad Obtenida
Sin Liberación
Menor a 1000
1000 - 1999
2000 - 2999
3000 - 3999
4000 - 4999
5000 - 5999
6000 - 6999
Mayor o Igual a 7000
MTD ESTERIL
MTD Estéril
Sin MTD
Menor a 1
1.0 - 1.9
2.0 - 2.9
3.0 - 3.9
Mayor o Igual a 4
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SOME OF THE DIFFERENCES FOUND

TABLE 5: Diet units and feeding surfaces provided to sterile flies in the different ERFs in relation to pupal density and feeding days.

	Reu[1,2]	Los Al[1]	Sar[1]	Tap[1,2]	Han[93]	Edn[3]	Rey[3]	Tij[3]
Diet Unit length (Inch)	8 (P) (T)	4 (T)	6 (T)	18 (P) (T)	3 (T)	3 (T)	4 (T)	6 (P)
Diet Unit width (Inch)	7.5	3	4	9.6[4]	1.5	1.5	2	4
Diet Unit height (Inch)	1	1	0.75		0.75	0.75	1	1
Diet Unit number	1	2	1	2 (T) 4 (P)	2	2	2	1
Total Feeding Surface (Inch^2)	1 x 151= 151	2 x 38 = 76	1 x 63 = 63	2x173=346 (T) 4x173=692 (P)	2x15.75 = 31.5	2x15.75= 31.5	2 x 28 = 56	1 x 28 = 28
Pupae / Tray or PARC Box (x 1,000)	38.5 (P) 25 (T)	21(T)	25 (T)	60 (P) 21.4 (T)	13 (T)	13 (T)	10.52 (T)	30 (P)
Days Feeding before Release	3	2	3-4	3	3-5	3-5	3-5	2
Surface/Day/ 1000 Pupae	1.31 (P) 2.01 (T)	1.81	0.84 (3d) 0.63 (4d)	3.84 (P) 2.69 (T)	0.81 (3d) 0.48 (5d)	0.81 (3d) 0.48 (5d)	1.77 (3d) 1.06 (5d)	0.47

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Quality Control

- Daily Testing for:
- Adult emergence
- Flight ability
- Longevity
- All QC data is posted on website

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TABLE 2: Routine quality control data for Medfly and Mexfly reported by each ERF

QC at arrival	Unit	Reu[1]	Tap[1]	Los Al[1]		Star[1]	Rey[2]	Han[2]	Edn[2]	Tij[2]
Hypoxia	Hours	4	0.5	26a	23b	27-33	2-3	3	2	29-33
Irradiation dose	Gy	100	120	145	145	145	80	80	80	-
Day of sampling/wk	Days	4	7	7	7	4	4	4	7	2
Size of sample/d	Thousands	225	140	17	17	6	18	15	10.7	1100
Size of sample/wk	Thousands	900	980	119	119	24	74	60	75	2200
Pupal weight	milligrams	7.82	7.2	7.7	7.7	7.3	16	17	17	18
Fly emergence	%	81.1	85.5	76.2	85.7	78	76	85	85	88
Flight ability	%	74.8	75.9	68.4	80.1	79	84	81	81	86
Longevity (48h[1];72h[2])	%	34.5	73	46	63	36	70	60	60	N/A
QC pre-chilling										
Day of sampling/wk	Days	5	7	N/A	N/A	4	4	N/A	N/A	2
Size of sample/d	Thousands	500	60	N/A	N/A	1	50.9	N/A	N/A	90
Size of sample/wk	Thousands	2500	420	N/A	N/A	4	211	N/A	N/A	180
Flight ability	%	71	75.9	N/A	N/A	70.3	85	N/A	N/A	89
QC post-chilling								N/A	N/A	
Day of sampling/wk	Days	5	7	7	7	4	4	N/A	N/A	2
Size of sample/d	Thousands	38.5	60	4	4	1	50	N/A	N/A	90
Size of sample/wk	Thousands	192.5	420	28	28	4	211	N/A	N/A	180
Flight ability	%	95	73.1	60	74.5	N/A	83.3	N/A	N/A	85
QC post-release										
Holding time										
Fly emergence (50%) time	Hours	70	48	48	48	N/A	50	48-72	48-72	55
Fly age at release	Hours	71	72	48	48	72	100	3-5d	3-5d	55

1 Data correspond to *C. capitata*; a= pupa from Guatemala, b = pupa from Hawaii

2 Data correspond to *A. ludens*

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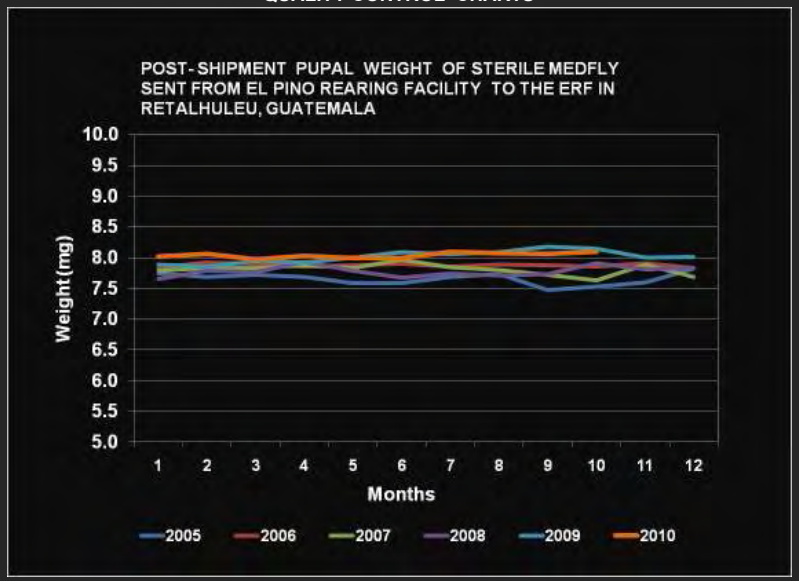
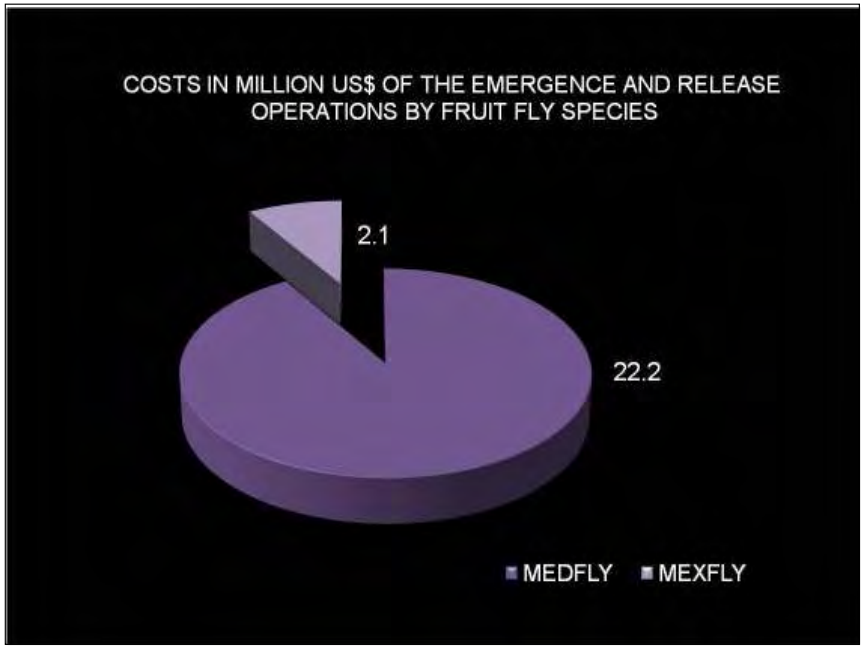
QUALITY CONTROL CHARTS





Emergence and release facilities require the following:

Modernization to implement new technologies, efficiencies, and worker safety.

Standardization of operating procedures and quality control assessments.

Periodic review by an independent international panel for quality assurance.

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Modernization to implement new technologies, efficiencies, and worker safety.

Improve operational efficiencies with more permanent modular structures

Consider ISO certification for all ERFs.

Expand current "FFSIT Quick Place" Internet site as an information dissemination tool to include standard quality control data and other critical information from all production facilities and ERFs. Data should be managed so that comparisions can be made among ERFs.

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Standardization of operating procedures and quality control assessments.

Increase the amount of food provided.

Establish QC protocols at all ERFs to evaluate absolute flyers and longevity with water but without food after the emergence, feeding, chilling and release process.

Increase the age of release

Compare the effects of different emergence systems, including varying the size (volume) of the containers and resulting fly density, on sterile male performance in the field.

Evaluations of the cost-effectiveness and operational use of protein in the adult diet, in conjunction with both hormonal and semiochemical supplements still needs to be conducted in fly emergence centres.

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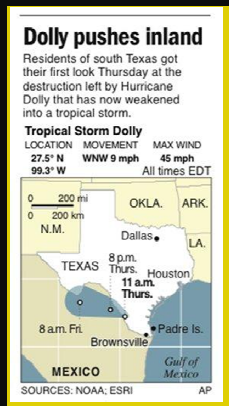
Periodic review by an independent international panel for quality assurance.



UPDATES storm path; graphic shows the projected path of Tropical Storm Dolly; 1c x 3 1/4 inches; 46.5 mm x 82.6 mm

The Gazette
gazetteonline.com

Homes sit under floodwaters after Hurricane Dolly hit the area in Matamoros, Mexico, Thursday, July 24, 2008. Power was restored to large parts of Matamoros and floodwaters were dropping Thursday, a day after Hurricane Dolly hit. Officials said a man was electrocuted from a downed power line in this border city, the only death reported in Mexico from Dolly, which struck land just north of the border in Texas. (AP Photo)Image 7 of 20

ACKNOWLEDMENTS

REVIEW TEAM

PROGRAM PERSONNEL

PROGRAM REYNOSA - FF. ILLUSTRATIONS

THANKS!!!