Challenges of using Biological Control in cut Gerbera production in San Diego County

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Topics

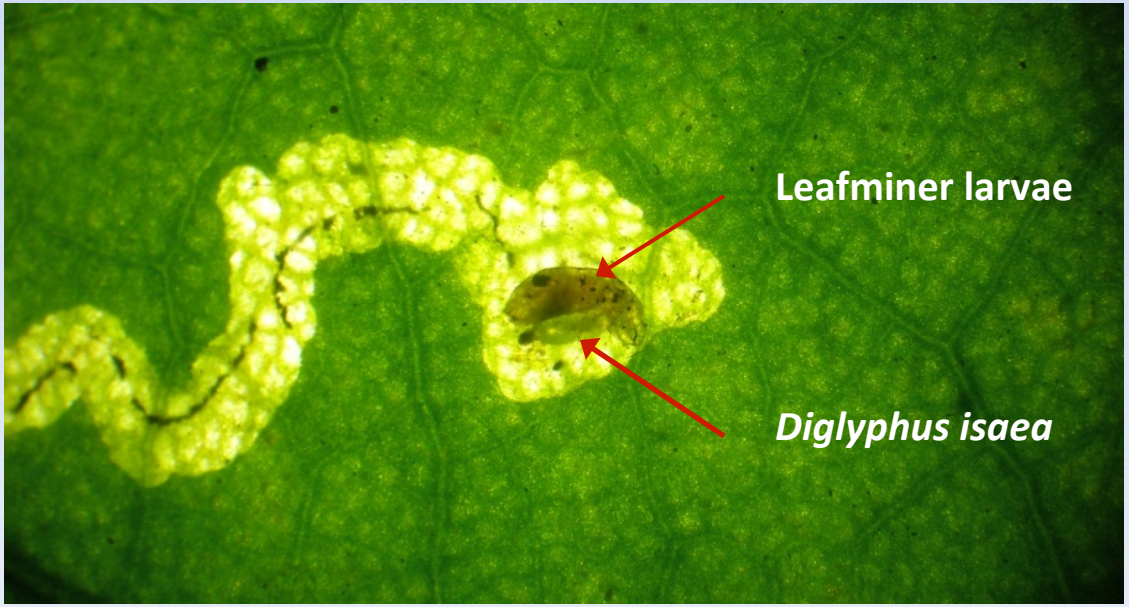
- Gerberas: Pests and Diseases
- Scouting
- Early detection of pests
- Pesticide Use
- Considerations: decision making and associated costs
- Benefits and challenges of running a bio program
- Lygus
- New Developments

In the Beginning

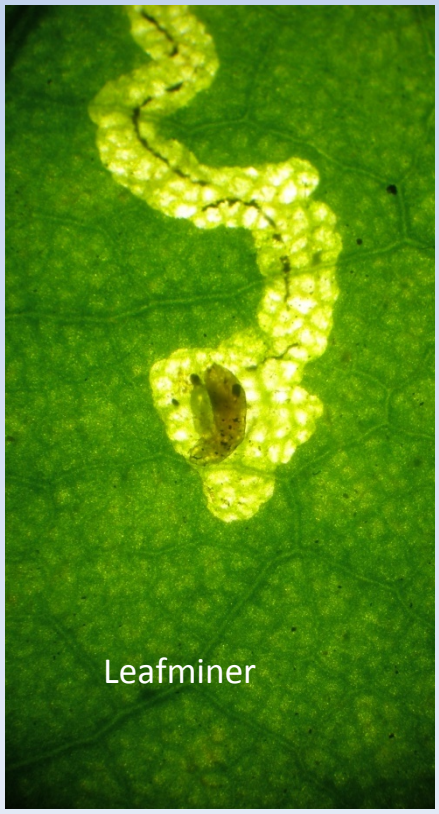
Why did we start using beneficials?

Existing pesticides were not effective in controlling leafminer

This was 10 years ago – it is still the case today



Insect Pests



Leafminer

Spidermite

Thrips

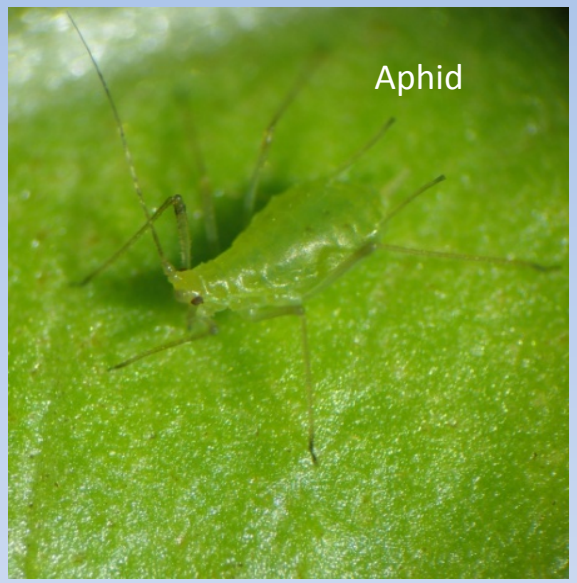
Aphids

Cyclamen mite

Broad mite

Whitefly

Lygus bug



Diseases

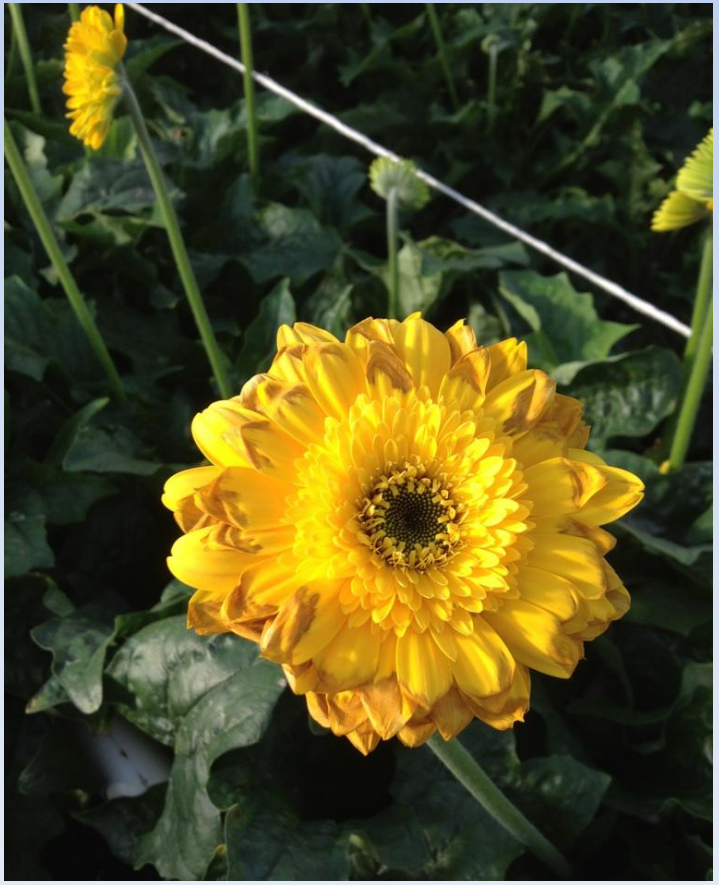
Powdery Mildew

Botrytis

Pythium

Fusarium

Sugar Rot



Methods of Control for Disease and Pest Pressure

Beneficial Insects

Pesticides

Fungicides

Cleaning/Killing by hand
-lygus bug

Irrigation Management

Climate Control

Scouting

Good training is the key to scouting – **training never stops**

-seminars, internet, research, Koppert reps, word of mouth

Good scouting requires **diligence** and **time**

-walking crop and checking plants

-check insect populations with sticky cards

Scouting tools:

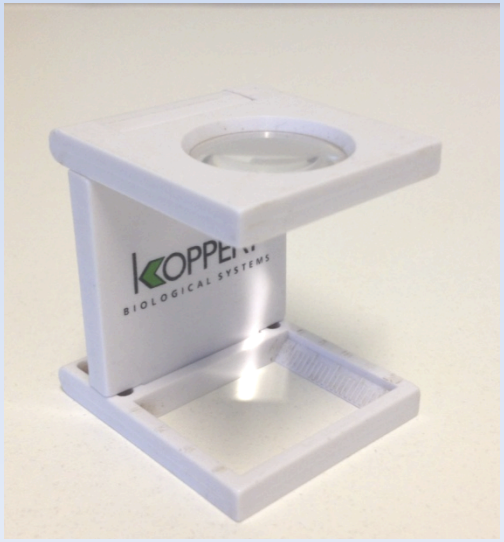
-loupe

-microscope

-magnified visors

-flags

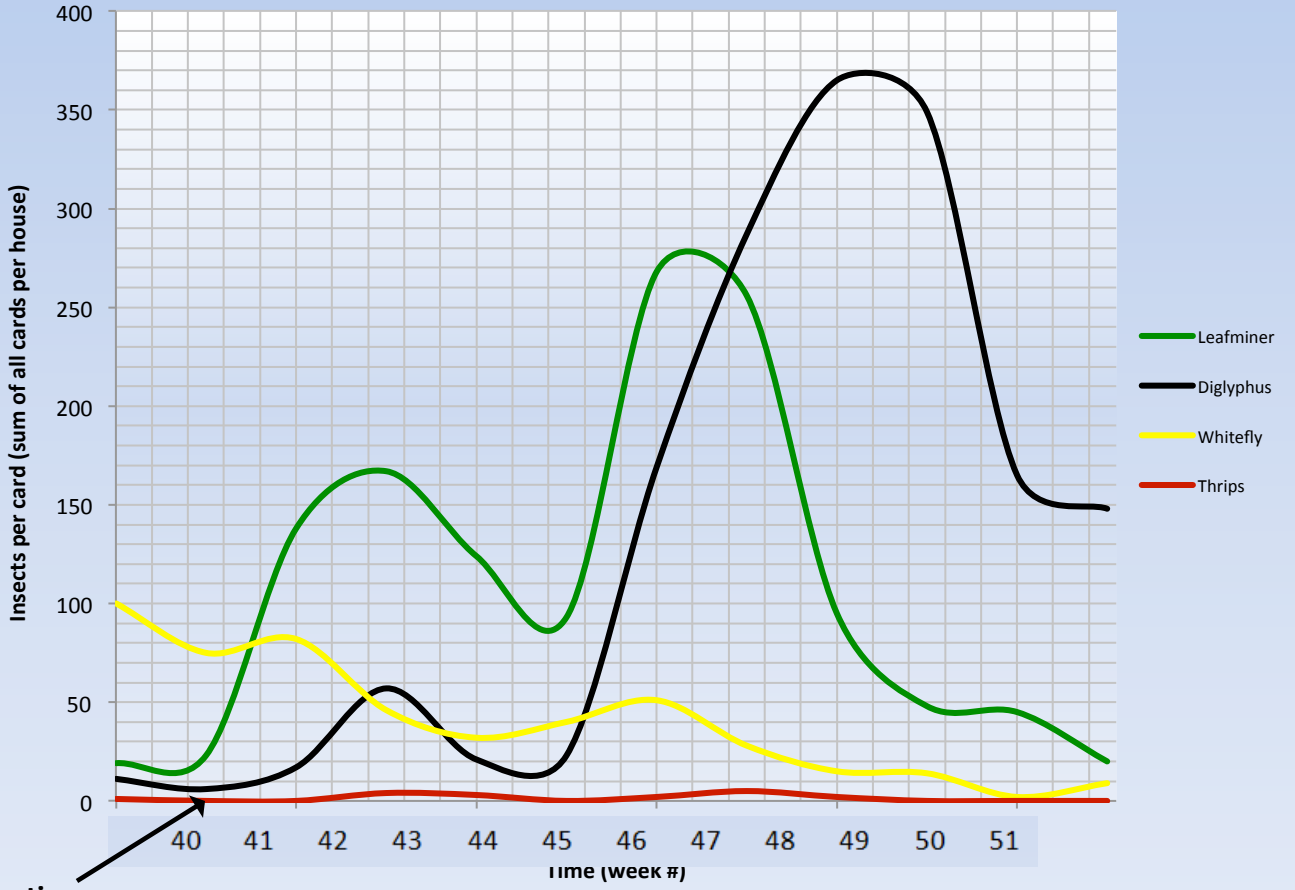
-sticky cards



Sticky Card Data

Sticky Card Counts

Week #	Leafminer	Diglyphus	Whitefly	Thrips
40	19	11	100	1
41	23	6	75	0
42	138	17	82	0
43	167	57	46	4
44	124	21	32	3
45	93	23	40	0
46	268	169	51	2
47	256	287	28	5
48	95	365	15	2
49	48	349	14	0
50	45	165	2	0
51	20	148	9	0



Early Detection of Pests

Preventative biological introductions are generally more effective and financially advantageous when compared to doing corrective introductions or sprays.

Early Detection of Pests

1. Recognize pest presence (or disease infection)

2. Determine pest **population level**
   -sticky card counts
   -visual recognition of pest population in crop

3. Make **informative** decisions
   -biological introduction
   -chemical correction

Pesticide Use

Chemical choice is important for three main reasons:

-choose a chemical that will have effect on **multiple pests**

-consider the effect on invested **beneficial population(s)**

-consider **resistance**

Softer chemicals that are compatible with beneficials are often limited spectrum.

Secondary pests like Lygus and Broadmite are not as easily controlled by using the softer pesticides.

Benefits of Using Biological Control

No re-entry period

No negative effect on plants

Long term control

Improve your bottom line

Fewer sprays result in less resistance (when a spray is necessary)
and fewer labor hours spent spraying

Challenges to Consider when Using Biological Control

Investment is up front in order to get a healthy beneficial population established

Intense scouting is necessary in order to catch pest populations at levels where beneficials can effectively control them

Biologicals are the most effective as a preventative measure, or when insect pressure is light to moderate

A biological program will require additional time and maintenance

Secondary pests like Lygus require heavier sprays which can reduce the biological populations

Lygus

No natural enemy is commercially available at this moment

Substantial damage to flowers

#1 threat to a successful beneficial program.

Constant spray program has a negative effect on the beneficials

Peristenus digoneutis

Lygus kills per week 2011

Week	Section 1, 3, 5	Section 2, 4	Secion 9, 11	Section 11, 13	Section 15	Section 16	Total per week
31	3300	2035	2822	2105	0	0	**10262**
32	973	701	1597	1624	0	0	**4895**
33	970	419	1069	726	59	50	**3293**
34	2833	870	2289	1301	63	23	**7379**
35	1537	1780	3025	2332	65	26	**8765**
36	1262	659	1527	937	38	12	**4435**
37	937	145	348	267	9	26	**1732**
38	1079	159	639	247	0	0	**2124**
39	968	333	422	184	0	0	**1907**
40	486	98	376	208	0	0	**1168**
41	854	58	0	0	0	0	**912**
42	518	85	0	181	0	0	**784**
43	730	128	101	0	0	0	**959**
44	236	67	85	0	0	0	**388**
45	179	50	45	0	0	0	**274**
46	152	193	85	0	0	3	**433**
47	322	214	0	0	5	0	**541**
48	1039	1630	0	357	0	0	**3026**
49	1330	355	159	225	0	0	**2069**
50	1699	488	329	168	0	0	**2684**
51	1398	339	0	81	0	0	**1818**
52	171	87	189	0	0	0	**447**
Totals	**22973**	**10893**	**15107**	**10943**	**239**	**140**	**60295**

Per Acre Beneficial Program

Set price per acre

Communication between pest manager/scout and Koppert

Work together to make decisions

Make as many beneficial introductions as necessary to maintain a clean crop

Final Thoughts…

There is no single recipe for success using beneficial organisms. Finding an effective balance between beneficial/chemical is a complicated delicate process that we are still trying to master.