BIOLOGICAL GROWING
at Pioneer Gardens, Inc.

ROGER MCGAUGHEY

SENIOR HEAD GROWER

PIONEER GARDENS, INC.

Pioneer Gardens, Inc. Fall 2018

AT PIONEER GARDENS WE GROW AND PROVIDE OUR CUSTOMER BASE WITH A NATURAL, HABITAT-FRIENDLY PLANT PRODUCT. THIS GIVES OUR CUSTOMERS A JUMP-START FOR THEIR OWN BIOLOGICAL GROWING PROGRAM, WHICH WE ARE ATTEMPTING TO PROMOTE.

WE HAVE BEEN GROWING YOUNG PLANTS BIOLOGICALLY FOR OUR CUSTOMERS FOR 6 YEARS.

ROOTSHIELD PLUS APPLICATION

RootShield Plus applications provide our cuttings and transplants with an enhanced rooting environment, producing white healthy root systems.

The aim of this is to avoid the use of any chemical root protectant fungicides later in the production process.

RootShield Plus is applied to all plants grown at Pioneer Gardens.

The following slide shows the method of application of RootShield Plus.

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ROOTSHIELD PLUS APPLICATION

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ATHETA, HYPOASPIS AND AMBLYSEIUS CUCUMERIS

These Biological control agents (BCA'S) are introduced on a weekly basis in propagation.

They are also applied to newly transplanted material with the object of achieving fungus gnat and Thrips control.

These are self-perpetuating BCA's reproducing on site, and can be found in finished product as it leaves the nursery, which is a biological benefit for the receiving finishing grower.

We also apply a mixture of Citation, Pageant and Uptake weekly in propagation. Recently we have been rotating with Citation, Mural and Verdanta OFE.

ATHETA, HYPOASPIS AND AMBLYSEIUS CUCUMERIS

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POTATO WEDGES

This is a simple way of checking for Fungus gnat larvae populations. We consider this our control card for fungus gnat scouting.

Potato wedges also help us see if we have confirmation of a Hypoaspis population.

We don’t need to use this method often as cards in prop are generally clean.

POTATO WEDGES

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YELLOW CARDS: (NOT SOCCER :-)

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HUNTER FLIES

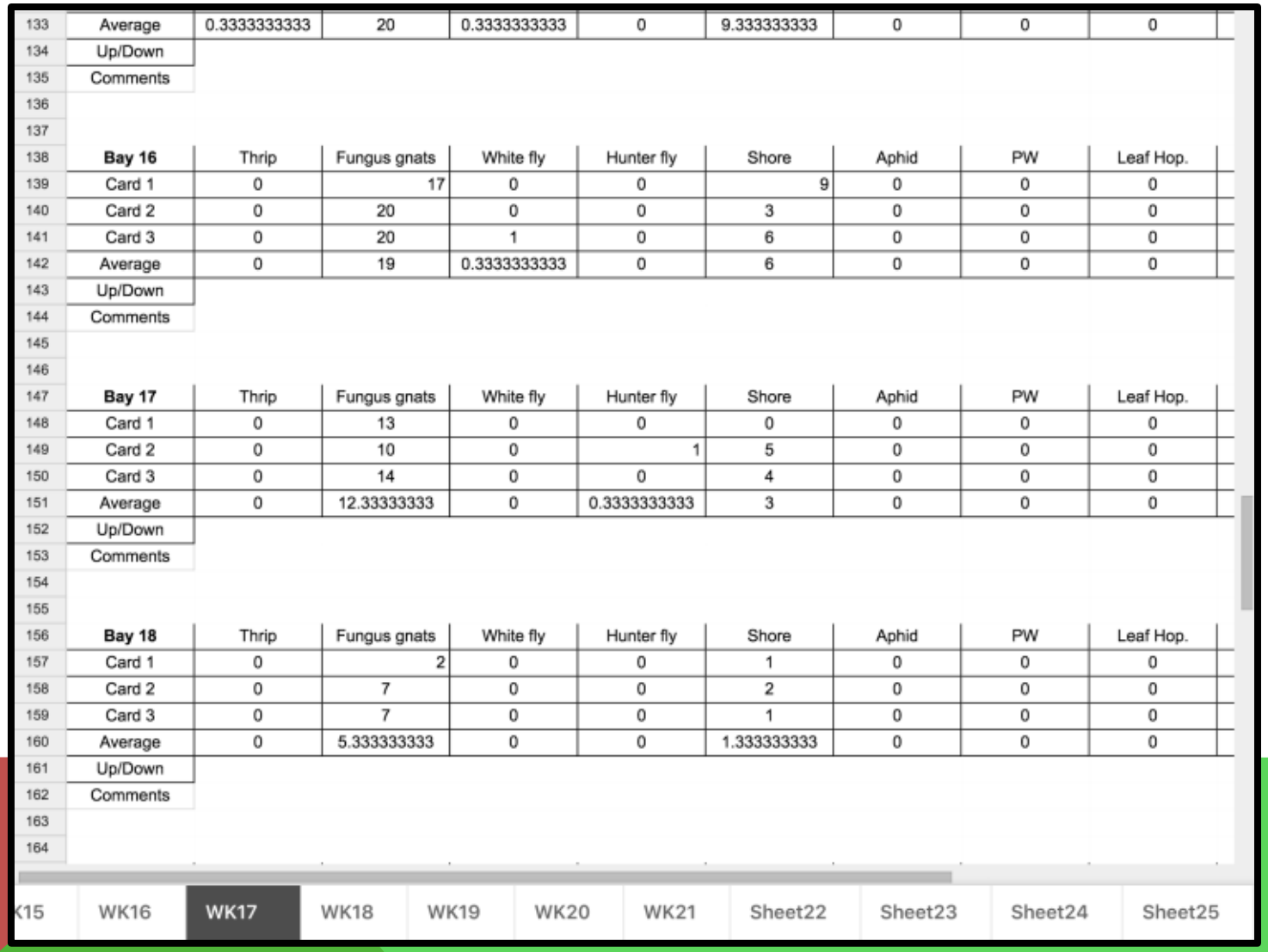
These flies appear naturally in spring when you are not spraying nasty pesticides.

They are known to catch adult fungus gnats even in flight.

WEEKLY SCOUTING

This is extremely important and is used to monitor the effectiveness of a BCA program.

SCOUTING RECORD KEEPING



133	Average	0.3333333333	20	0.3333333333	0	9.333333333	0	0	0
134	Up/Down								
135	Comments								
136									
137									
138	**Bay 16**	Thrip	Fungus gnats	White fly	Hunter fly	Shore	Aphid	PW	Leaf Hop.
139	Card 1	0	17	0	0	9	0	0	0
140	Card 2	0	20	0	0	3	0	0	0
141	Card 3	0	20	1	0	6	0	0	0
142	Average	0	19	0.3333333333	0	6	0	0	0
143	Up/Down								
144	Comments								
145									
146									
147	**Bay 17**	Thrip	Fungus gnats	White fly	Hunter fly	Shore	Aphid	PW	Leaf Hop.
148	Card 1	0	13	0	0	0	0	0	0
149	Card 2	0	10	0	1	5	0	0	0
150	Card 3	0	14	0	0	4	0	0	0
151	Average	0	12.33333333	0	0.3333333333	3	0	0	0
152	Up/Down								
153	Comments								
154									
155									
156	**Bay 18**	Thrip	Fungus gnats	White fly	Hunter fly	Shore	Aphid	PW	Leaf Hop.
157	Card 1	0	2	0	0	1	0	0	0
158	Card 2	0	7	0	0	2	0	0	0
159	Card 3	0	7	0	0	1	0	0	0
160	Average	0	5.333333333	0	0	1.333333333	0	0	0
161	Up/Down								
162	Comments								
163									
164									

K15 | WK16 | **WK17** | WK18 | WK19 | WK20 | WK21 | Sheet22 | Sheet23 | Sheet24 | Sheet25

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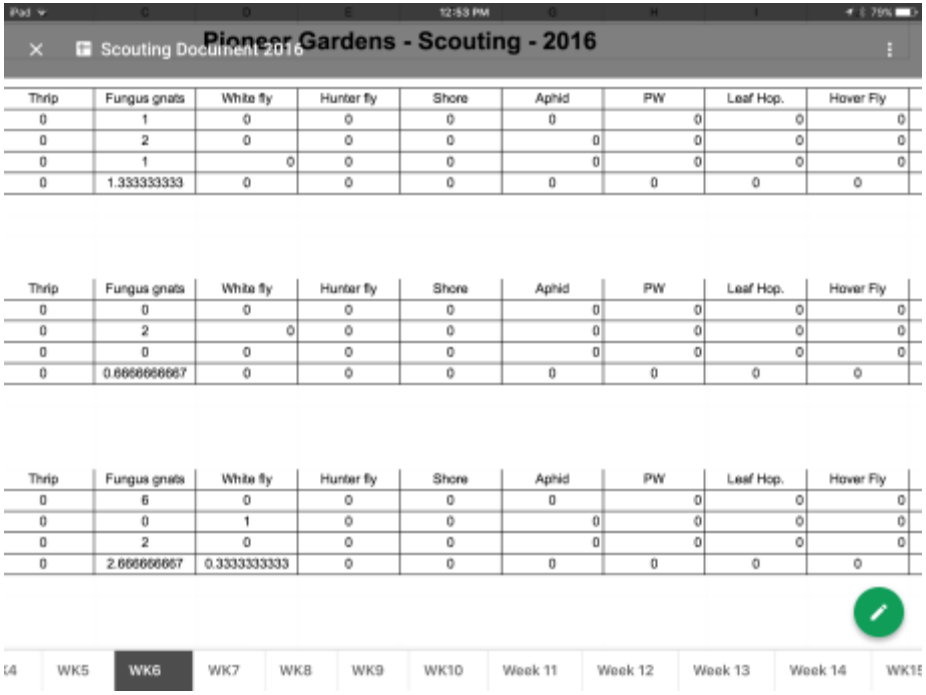
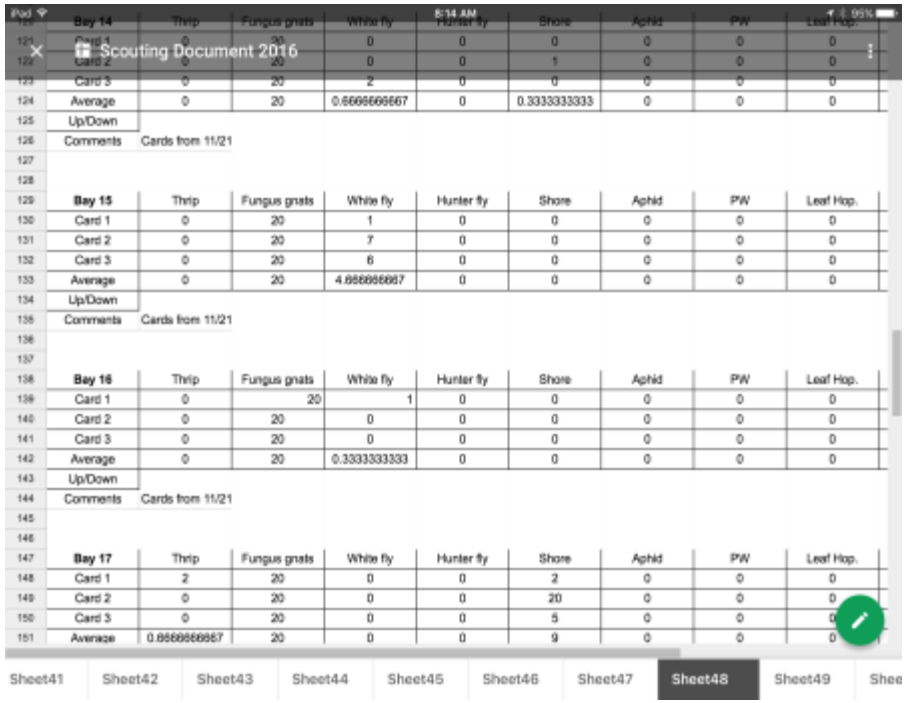
IPAD AND GOOGLE DRIVE USAGE



Thrip	Fungus gnats	White fly	Hunter fly	Shore	Aphid	PW	Leaf Hop.	Hover Fly
0	1	0	0	0	0	0	0	0
0	2	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0
0	1.333333333	0	0	0	0	0	0	0

Thrip	Fungus gnats	White fly	Hunter fly	Shore	Aphid	PW	Leaf Hop.	Hover Fly
0	0	0	0	0	0	0	0	0
0	2	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0.666666667	0	0	0	0	0	0	0

Thrip	Fungus gnats	White fly	Hunter fly	Shore	Aphid	PW	Leaf Hop.	Hover Fly
0	6	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0
0	2	0	0	0	0	0	0	0
0	2.666666667	0.3333333333	0	0	0	0	0	0



Bay 14	Thrip	Fungus gnats	White fly	Hunter fly	Shore	Aphid	PW	Leaf Hop.
Card 1	0	20	0	0	0	0	0	0
Card 2	0	20	0	0	1	0	0	0
Card 3	0	20	2	0	0	0	0	0
Average	0	20	0.666666667	0	0.3333333333	0	0	0
Up/Down								
Comments	Cards from 11/21							

Bay 15	Thrip	Fungus gnats	White fly	Hunter fly	Shore	Aphid	PW	Leaf Hop.
Card 1	0	20	1	0	0	0	0	0
Card 2	0	20	7	0	0	0	0	0
Card 3	0	20	6	0	0	0	0	0
Average	0	20	4.666666667	0	0	0	0	0
Up/Down								
Comments	Cards from 11/21							

Bay 16	Thrip	Fungus gnats	White fly	Hunter fly	Shore	Aphid	PW	Leaf Hop.
Card 1	0	20	1	0	0	0	0	0
Card 2	0	20	0	0	0	0	0	0
Card 3	0	20	0	0	0	0	0	0
Average	0	20	0.3333333333	0	0	0	0	0
Up/Down								
Comments	Cards from 11/21							

Bay 17	Thrip	Fungus gnats	White fly	Hunter fly	Shore	Aphid	PW	Leaf Hop.
Card 1	2	20	0	0	2	0	0	0
Card 2	0	20	0	0	20	0	0	0
Card 3	0	20	0	0	5	0	0	0
Average	0.666666667	20	0	0	9	0	0	0

Using these tools we can record weekly pest levels from year to year.

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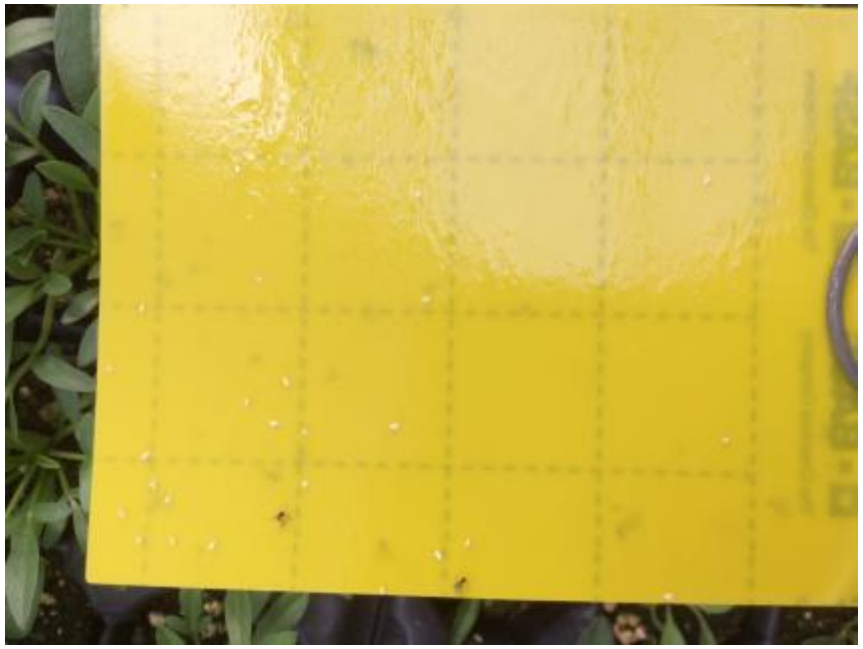
OTHER PESTS



Whitefly can also be trapped on yellow cards.

Encarsia formosa and Eretmocerus eremicus can be used for Whitefly control.

NEMATODES

Weekly spray applications of beneficial nematodes will guarantee a cost-effective, successful reduction of damaging Thrips populations to a very manageable level.

Nematodes also help reduce any fungus gnat population that may be present.

Nematodes have a zero REI (Re-Entry Interval) requirement, which means employees can immediately enter the working area. Most conventional chemicals have more than a 4-hour REI, causing compliance issues such as PPE (Personal Protective Equipment). With BCA's we have ZERO workplace interruption.

There are milder chemicals (Neonic-free) that can be used in conjunction with BCA's and invariably these can be applied along with nematodes.

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NEMATODES

Packets can be stored in a refrigerator for up to 4 weeks.

When mixing, keep water temperature above 50° and below 80°

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SPRAYING NEMATODES INSIDE AND OUTSIDE

Application conditions are important. Turn off any horizontal airflow fans, remove sprayer filters and keep application pressure below 300psi.

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APPLICATION TIMING AND VIABILITY

In summertime, get up early and use the tray the nematodes come in to catch some of your spray solution and check that the nematodes are curly.

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FOLIAR FEEDING

Foliar feeds can be added to the nematode mixture. Always add a spreader sticker.

Blue dye can also be added

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COMPATIBLE CHEMICALS

Some biologically safe pesticides and fungicides are also compatible with nematodes.

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APHID BANKER PLANTS

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APHID MUMMIES AND APHIDIUS

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PEPPER BANKERS AND APHID CONTROL

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PEPPER BANKER PLANTS

Grown under LED lights for happy customers.

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Aphidoletes

Aphidoletes Love Shack

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SPIDER MITES

There are a range of BCA's which can help control spider mite infestations.

This also means that REI requiring chemicals can be avoided.

We also apply Phytoseiulus to potential spider sensitive crops in the propagation area.

Bean plants can be used within the crops as damaging insect indicators.

SPIDER BCA'S

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BEAN BANKER PLANTS

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BEAN BANKER PLANTS

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NATURAL THRIPS CONTROL

Pepper banker plants can be used as a natural reproductive habitat for Orius which is a naturally occurring outdoor Thrips predator.

With the cultivation of pepper, lobularia and other pollen producing plant material, we are inviting the natural predator Orius to come into the production houses and help with Thrips control.

We also introduce Orius to start the in-house process of Thrips control.

PEPPER BANKER PLANTS

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PEPPER BANKER PLANTS (ORIUS)

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ORIUS

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GENERAL COLLECTION OF BANKER PLANTS

A collection of different banker plants provides a natural habitat for most of the BCA's required for biological control of damaging insects in the production process.

When properly implementing a BCA program, applications of harsh chemicals, especially 'Neonics', are not needed.

Selling plants in retail stores that have a possible BCA supply can only be good for the consumers home garden environment.

LOBULARIA BANKER PLANTS

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OTHER BANKER PLANTS

LARGE BANKER PLANTS

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FIELD BANKER BEDS

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FIELD BANKERS EARLY DAYS

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FIELD LOBULARIA BANKERS 2017

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LOBULARIA & NATURAL CROP BANKERS 2017

Inter-crop plantings.

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FIELD LOBULARIA BANKERS 2018

Orius introduction

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THRIP INFESTED DAY LILIES 2017

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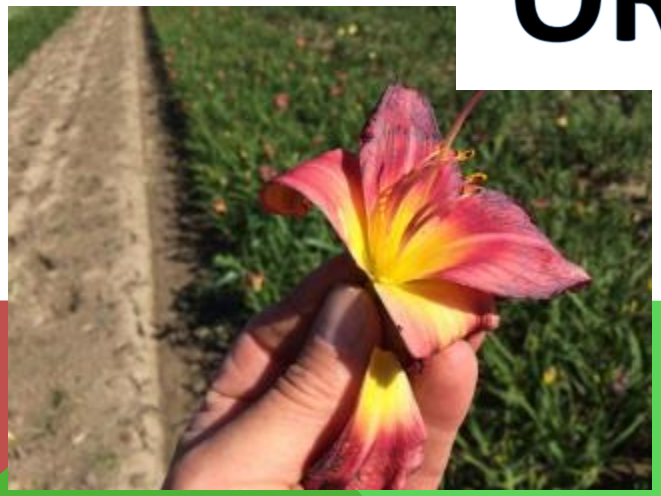
CLEAN DAY LILIES 2018

ORIUS



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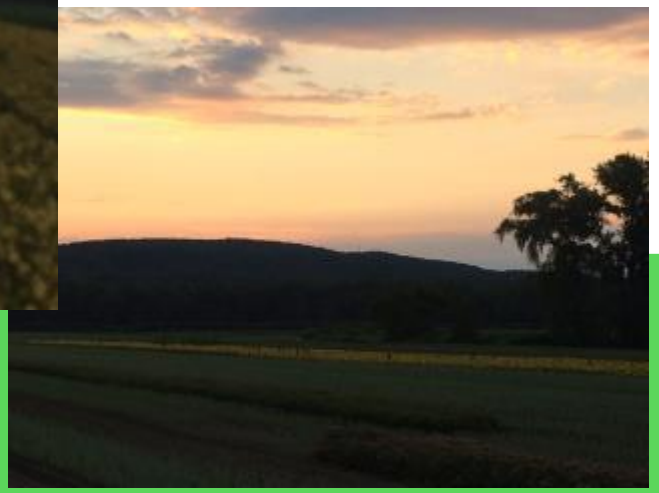
SCOUTING AT SUNSET



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FINAL COMMENTS

Biological control does work when done properly.

The initial investment may be more expensive than conventional chemical control methods, but considering pest resistance and new compliance standards for worker protection, in the long term a BCA program is definitely more environmentally friendly and cost-effective.

At Pioneer Gardens we have implemented and maintained a full 100% biological control program since September of 2012.

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Thank you for your interest in Pioneer's

BIOLOGICAL PERENNIAL PRODUCTION

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