



VILLAGE OF KEY BISCAYNE



Office of the Village Manager

MEMORANDUM

Village Council
Franklin H. Caplan, *Mayor*
Michael E. Kelly, *Vice Mayor*
Michael W. Davey
Enrique Garcia
Robert Gusman
Mayra P. Lindsay
James S. Taintor

DATE: October 23, 2012
TO: Honorable Mayor and Council Members
FROM: John C. Gilbert, Village Manager
RE: Ridgewood Drive: Gumbo Limbo Whitefly Update

Village Manager
John C. Gilbert

RECOMMENDATION

Based on the consultant findings and recommendations (attached), the Administration will continue our current programs to control the Whitefly infestation.

BACKGROUND

On September 4, 2012, the Village's efforts to control Whitefly were discussed with the Council. Our Consultants reported that we were achieving a higher rate of success in controlling this insect. However, some of our residents reported that the efforts of controlling the Whitefly on Gumbo Limbo Trees on the Ridgewood Road right-of-way have not been successful. Our contractor, TruGreen, advised that his company would re-inject the Gumbo Limbo trees on Ridgewood Rd. that met the below criteria:

- Advanced development or multiple life cycle stages of immature Whitefly present in significant numbers or throughout the tree.
- Fresh sticky honeydew or well developed sooty mold sticking to surfaces.
- New growth leaves infested with adult or immature whiteflies.
- If an absence of substantial sticky honeydew, flaking sooty mold falling off the tree or surroundings or visibly dead immature whiteflies no treatment was performed

He further advised that the results would be known in approximately 4-6 weeks. The Council subsequently requested that a status report would be provided to the Council at the October 23, 2012 meeting.

On October 10, 2012, Village Arborist John Sutton recommended (report attached) stopping the injections and starting a drenching program. On October 15, 2012, our entomologist Dr. Catharine Mannion found (report attached) that Whitefly populations have decreased in the Village. On Ridgewood Rd., she found that Whitefly infestation varies from low to high for a variety of reasons due to "...the high number of preferred trees, the severe pruning impacting insecticide application and stressing the trees and now the potential of a disease".



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Village of Key Biscayne
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Key Biscayne, FL 33149
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Date: October 10th, 2012

Re: Gumbo Limbos on Ridgewood Drive

There are some Gumbo Limbo trees on Ridgewood Dr. that appear to be doing better, however the overall health of the worst-affected Gumbo Limbo trees as of today is fair to poor. The trees are in a weakened state due to continuous defoliation from whitefly damage, and from expending a great deal of energy on subsequent regeneration of foliage. During my visits since the last insecticide application performed by TruGreen on September 9th, 2012, I have not observed a reduction in whitefly populations to non-damaging levels. Trees are still losing leaves and have heavy white residue on leaves (along with whiteflies).

The development of canker (cracks in the bark and oozing of sap) that was first noted about 3 weeks ago is getting worse, and was found today on an additional tree at 250 Ridgewood Rd. I collected samples today to send for disease analysis, and will follow up when the results are received. It is critical that nothing be done at this time to create added stress on the affected Gumbo Limbo trees. I do NOT recommend treatment by injection into vascular tissue due to the additional damage and stress that would be incurred from drilling more holes. Furthermore, we don't want to create additional entry points for fungal spores or bacteria that may be causing the canker. If there is pathogen involvement, it is unlikely that fungicide applications will provide a cure for the canker, however because weakened trees are more susceptible to invasion of opportunistic organisms, a protective fungicidal application should be made.

Recommendations are as follows:

1. Systemic fungicide (Cleary 3336) along with Macron 20-20-20 with micronutrients (John Deere Landscapes, formerly Lesco) to give the trees a boost of nutrients for new growth.

2. Systemic insecticide dinotefuran (Safari), which is in the same chemical class (neonicotinoids) as imidacloprid (Merit), however it is more soluble and is taken up quicker. This could be more effective since the stressed trees are not likely performing uptake and upward translocation as well as they normally would. Since it is now October and growth is slowing in all plants, this product will have the best chance of providing protection quickly.
3. All products recommended should be applied at label rates for root drench applications and applied in a sufficient volume to wet the first few inches of soil under the area of tree canopies (as opposed to root injection method).

Whitefly Project Update – October 15, 2012

Catharine Mannion, Ph.D.
Associate Professor and Extension Specialist
University of Florida, IFAS, Tropical Research and Education Center
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Brief Summary

1. Predatory beetles released at 17 locations – 2,390 released to date;
Parasitic wasps released at 7 locations – 320 released to date
2. One beetle predator and two parasitic wasps have become established, however, the impact on the whitefly infestations will take time
3. Beetle predators appear to be more negatively impacted by the insecticide used for whitefly control.
4. Overall, whitefly populations have decreased on Key Biscayne, but there still remains some hot spots with moderate to severe whitefly. These “hot spots” may also fluctuate.
5. Many of the insecticide treated locations show improvement
6. The situation on Ridgewood has been particularly difficult due to the high infestations, the high number of preferred trees, the severe pruning impacting insecticide application and stressing the trees, and now the potential of a disease. Results are variable on Ridgewood as there are trees that have little to no whitefly to trees that remain heavily infested.
7. Whitefly populations will naturally decline during the winter months due to cooler temperatures.
8. Evaluations will continue through May 2013.

Natural Enemy Release

The purpose of this project is to enhance the presence of natural enemies to control the Rugose spiraling whitefly through releases of known natural enemies and to ultimately determine the impact of these natural enemies on the whitefly infestation. As per the protocol, some of the releases would occur on trees that have been treated with an insecticide and others that have not. The purpose for this was to help determine if the insecticide used for control of the whitefly has a negative impact on the natural enemies. There have been releases of two natural enemies; a predatory beetle (*Nephaspis oculatus*) and a parasitic wasp (*Encarsia guadaloupe*).

The first release of the beetle occurred on May 29, 2012 followed by releases on eight subsequent dates through October 9. The total beetles released to date are 2,490 over 17

locations listed below (Table 1). The total parasitic wasps released to date are 320 (Table 2). The trees that are primarily targeted are gumbo limbo and palms and on occasion a few others have been included (i.e. Bird of Paradise, black olive).

To date, the predatory beetle has been established at half the release sites and one additional location where there was no release. All the locations that did not have an insecticide treatment (except two) had beetle establishment. There appears to be little to no establishment of predatory beetles on trees treated with insecticide. It is important to note that populations of beetles fluctuate greatly. Evidence of establishment is based on their presence over a period of time.

To date, parasitic wasps have established at all sites sampled which also includes some sites in which there were no releases. It appears that the parasitic wasps are less affected by the insecticide. Fewer wasps were released at fewer sites. The wasps were released at 7 sites but have been recovered from 17 sites indicating that they are spreading to new locations. Although the emphasis was on the release of one type of parasite, it is likely that a second parasite was also released. Both of these parasites have been established. Recently a third parasite has been recovered but not yet been identified. These are excellent results and a good indicator that these wasps are established and spreading to new areas of infestation.

Using predators and parasites for pest control can ultimately provide a long-term, biologically based solution. But it also requires patience. Thus far, the release of parasites and predators is successful in that there is establishment of one predator and two parasites. These populations should grow, but unfortunately it takes time for the populations to grow enough to show the impact they have on the pest population.

Table 1. Predatory Beetle Release

Location	No. Beetles Released	Location	No. Beetles Released
MM 2.2 Crandon Blvd.	100	599 W. Enid (I)	20
MM 2.0 Crandon Blvd.	135	261 Island Dr.	20
Church on Harbor Dr.	125	699 Glenridge	200
701 Harbor Lane (I)	210	CVS at Crandon & W. Wood	250
Cape FL Dr, black olive (I)	210	Library on Crandon	50
Vacant lot 741 Harbor Dr.	160	375 Redwood	50
724 Ridgewood (I)	120	240 Cypress (I)	75
773 Ridgewood (I)	345	Rickenbacher Beach	25
265 Ridgewood (I)	395		

Sites treated with an insecticide are marked with an (I).

Table 2. Parasitic Wasp Release

Location	No. Wasps Released	Location	No. Wasps Released
701 Harbor Lane (I)	50	724 Ridgewood (I)	50
Vacant lot 741 Harbor Dr.	25	773 Ridgewood (I)	50
599 W. Enid (I)	60	265 Ridgewood (I)	60
Harbor Plaza Median	25		

Sites treated with an insecticide are marked with an (I).

Whitefly Infestation

Although there has been periodic sampling and observation from May 25 to date, the most intensive evaluations were conducted on September 11, 25 and October 9. Select plants at each location were evaluated for level of infestation (0 = no infestation to 5 = severe infestation) (Table 3). On September 25, in addition to the ratings, a sample of 20 leaves were randomly collected from each tree and the total number of live whitefly immatures were counted under the microscope. The locations in which the infestation worsened are highlighted in pink. Slightly more than half of the locations continue to have moderate to heavy infestations of the whitefly. Most of the locations had moderate to heavy live whitefly (Table 3). All locations treated with insecticide (Table 3), except one, have low infestations and most of these had lower levels of live whitefly. It is not surprising that the locations that we are seeing establishment of predators and parasites still have moderate to high whitefly infestation because of the time it takes for these natural enemies to have impact. The locations with the highest percentage of parasitism were at 701 Harbor Lane, vacant lot at 41 Harbor Drive, and on the tropical almond tree at the library.

Although there have been several high infestation areas, **Ridgewood** has been one of the worst. We are not completely sure why this street in particular has been so bad. It is an area that likely became heavily infested before any action was taken. It also has many gumbo limbo trees which are one of the preferred hosts of the whitefly. This was complicated by severe pruning of the trees shortly after an insecticide application which likely removed most of the insecticide. Throughout this project we have seen improvement on some trees while others remain infested. We know that the predatory beetles are not establishing, however, the parasites are establishing. Many of the gumbo limbo trees have been retreated with insecticide. Another, newer, complication is the presence of canker. Additional stress such as this can potentially cause additional problems with the whitefly and its management. On October 1, we evaluated several locations on Ridgewood (676 to 797). Trees from 676 to 690 had heavy infestations while most other trees from 691 to 797 (with a few exceptions) had moderate to low infestations. The Ridgewood locations used in this project currently have little

to no whitefly. It is unclear why some trees that have received repeated insecticide application continue to have severe whitefly (i.e. 749). Although this situation does exist, it is not across the board for all the trees. In those situations, it is recommended that the Chemical Company, the Arborist and the University revisit those trees to consider potential options.

Table 3. Whitefly Infestation Rating

Location	Insecticide	Infestation Rating 9-11-12	Infestation Rating 9-2512	Infestation Rating 10-9-12	Total Live Whitefly (20 leaves)
mm 2.2 Crandon Blvd.		2	3	5	3086
mm 2.0 Crandon Blvd.		3	4	4	5545
church on Harbor Drive		5	5	5	4484
Harbor Plaza Median		1	1	0	1
701 Harbor Lane	Yes	4	4	4	2091
Cape Fla. Drive	Yes	2	1	1	304
vacant lot, 741 Harbor Dr		1	1	1	124
724 Ridgewood	Yes	1	1	1	553
773 Ridgewood	Yes	1	0	0	0
599 W. Enid	Yes	2	4	2	1336
261 Island Drive		1	1	-	0
265 Ridgewood	Yes	1	0	1	0
699 Glenridge		4	4	3	1032
CVS, Crandon Blvd		2	3	3	681
Library (gumbo limbo)		3	1	5	1114
Library (tropical almond)		1	3	1	143
375 Redwood		2	4	3	2422
240 Cypress Dr.	Yes	2	2	3	369

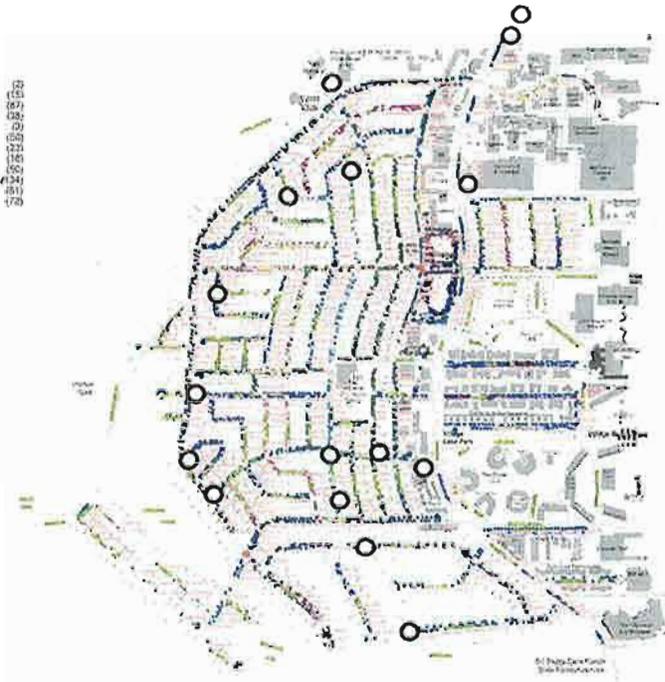
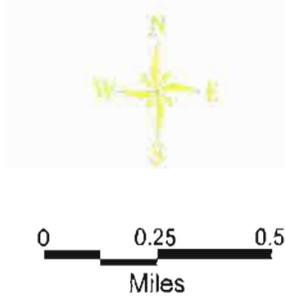
Future Expectations

Evaluations of whitefly infestations and presence of natural enemies will continue through May 2013. Whitefly infestations, in general, naturally go down during the winter as temperatures cool which will also impact the natural enemies. A key period will be next Spring when temperatures warm. At that time, it will be important to assess if and where any insecticide applications should be made and to determine the presence of natural enemies.

Release Sites of the Predatory Beetle

Trees by Type

11	Pithecellobium	22
25	Queen Palm	153
1847	Reclining Date Palm	67
432	Royal Palm	38
11	Royal Poinciana	20
170	Sabal Palm	50
2	Swain Leaf	23
440	Sea Grape	18
657	Silver Buttonwood	50
32	WILD TAMARIND	154
52	Yellow Poinciana	81
346	Yellow Tabebuia	170
124		



Release and Recovery Sites of the Parasitic Wasp

Trees by Type

11	Pithecellobium	22
25	Queen Palm	153
1847	Reclining Date Palm	67
432	Royal Palm	38
11	Royal Poinciana	20
170	Sabal Palm	50
2	Swain Leaf	23
440	Sea Grape	18
657	Silver Buttonwood	50
32	WILD TAMARIND	154
52	Yellow Poinciana	81
346	Yellow Tabebuia	170
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