

Island
ENVIRONMENTAL
PEST CONTROL

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To: Richard Kahn c/o Jeffrey Epstein

From: John Schiller General Manager of Island Environmental Pest Control

We visited Little Saint James Island, USVI from 12/8/14 to 12/12/14 for the purpose of evaluating the conditions of the landscape plantings around the island. This report is to inform you of our observations and recommendations.

Our people met with Mr. Epstein a few times to discuss his concerns about the landscape plantings. He also asked for suggestions regarding plant material that provide more color and scent. There certainly are challenges with growing landscape plants on the island, namely constant high winds and aerosolized salt. Wild deer feeding on landscape plantings have also been a problem.

In general, the landscape looks very good. Areca palm and other plantings have very dark green leaves and good color which indicates the richness of the soil, in particular, with the minerals magnesium and Iron. Other than salt/wind burn in some areas, most all of the landscape plantings appear to be growing well and are irrigated with high quality fresh water through the reverse osmosis system used extensively throughout the Island.

Our people met several times with the island's landscape manager Chris to ask him about his cultural practices and get his perspective on what works and doesn't work on the island. He was very helpful regarding understanding the everyday variables of the Island.

One of the main problems discovered is an insect the islanders call whitefly but it is really a white colored scale insect commonly called Ensign Scale. We saw the Ensign Scale on a variety of different landscape plantings including bougainvillea, sea grapes and native trees. Chemical control of the scale is listed below along with rotation of chemicals which is always necessary so the insect doesn't build a resistance against any particular product.

Presently landscapers are spraying most of the landscape material with Malathion and Mallet which is a generic form of Imidicloprid. Chris the landscape supervisor is not permitted to treat the plant material when Mr. Epstein or other company is present due to the horrific smell of the Malathion. The combination of Malathion and Mallet is an effective combination however there are other very effective non-smelling products that can and should be used in a rotation. Using other combinations that don't smell would also solve the issue of spray schedule frequency. It is important to stay on a schedule to break insect cycles.

See below for products to rotate.

One of the best pesticides for scale insects is Safari plus Distance IGR. Safari is in the same chemical family as Mallet (imidacloprid) but is more effective on scale insects especially combined with Distance IGR. Distance Insect Growth Regulator disrupts insects hormones so insect eggs don't hatch and juvenile insects do not become adults. Distance IGR is very good on scale insects to help break their life cycle and reduce the re-infestation of treated landscape plantings.

It was noted by the main house and other scattered areas around the island that the Bougainvillea hedges are showing a large amount of caterpillar damage. Chemical control for caterpillars includes Talstar, Sevin, Acephate & Intrepid. Acephate does have a strong odor when sprayed but it dissipates quickly and a masking agent known as Abscents can be used to eliminate the smell as well. However Acephate's smell is not nearly as bad as Malathion and even Abscents won't mask the smell of Malathion.

We also highly recommend the use of Leaf wetting agents for the foliar applications to help spread the pesticides evenly over the leaf surface instead of the spray beading up and rolling off the waxy leaves. There are dozens of wetting agent adjuvants available but we use Helena Chemical Company's Induce & Cohere or Ad Spray 101. Better leaf coverage with leaf wetting agents will result in better insect control.

It is also recommended to mix your chosen systemic insecticides such as Mallet / Imidicloprid, Safari or Tristar with the chosen wetting agent, along with a water soluble nitrogen fertilizer such as 20-20-20 or Viva which is a 3-0-8 which allows for better overall absorption into landscape material.

We were informed that one of Mr. Epstein's concerns is the lack of blooming in the older purple Bougainvillea hedge that extends for over a hundred feet around the back of his quarters. This hedge is constantly sheared to keep a very formal appearance but there are no flowers. The constant trimming is cutting off the new growth that would produce blooms. There are blooms on smaller plants in the same hedge that were used to fill a few gaps because they are shorter and not being trimmed.

Suggest cutting back the hedge 18 to 24 inches and letting the new growth develop with only light periodic trimming. There are Bougainvillea Special dry fertilizers that help improve blooming like the Bougain 6-8-10 dry fertilizer and there is a liquid fertilizer from Helena Chemical Co. called Asset RTU 6-20-5 that has a rooting hormone in it that promotes blooming in bougainvilleas. Landscapers have good results with it in Florida when they drench bougainvillea roots once a month. Helena Chemical Company also has this product in one of their dry fertilizers, a 5-10-15 which also works well on bougainvillea and this would also be a good fertilizer for new coconuts and other landscape plantings.

I've had good results on my bougainvilleas with palm special type fertilizers like 13-3-13 or 8-2-12. Frequent light fertilizer applications may give better results if the bushes are irrigated frequently or it rains often. The Bougain 6-8-10 seems to only last about 8 weeks so it needs to be reapplied every other month but the Asset RTU 6-20-5 monthly drench along with the Bougain 6-8-10 is a great combination. The landscapers can continue to use 20-20-20 as well on the foliar applications.

There have been a large number of coconut palms planted on the island and more are currently being installed. Most of the coconuts that we saw coming in look good but there are few issues. Some of the coconuts have a lower leaf yellowing. This is common in Florida and is a symptom of low nutrient levels, in particular, magnesium. On LSJ Island the yellowing on the coconuts scattered about is due to feeding damage from Red Palm Mites not nutrient deficiency. Red Palm Mite are an invasive microscopic mite that has spread around the world and made its way into the Caribbean in 2004 and into Florida a couple of years later. These microscopic insects build up in huge numbers on the undersides of leaves / fronds and cause leaf yellowing when they feed on plant sap.

Red Palm Mites can be controlled with a combination of miticide foliar spray applications mixed with leaf wetting agent and applied to the affected palm leaves if they can be reached by foliar stream. There is no effective systemic miticide. In other words drenching roots with a systemic is not an option. Leaf wetting agent is critical for mite control as mites are so small that incomplete leaf coverage will result in reduced effectiveness. It normally takes more than one application for curative results and additional service should be 7 to 10 days apart. Of course the trade winds constant blowing makes high level spraying difficult.

Red Palm Mite damage is reduced when palms are well fertilized so that should be the first technique employed to reduce damage. Utilize a granular fertilizer such as an 8-2-12 or 13-3-13 quarterly to keep palms strong so damage is minimized from whatever attacks. We also recommend a liquid drench product called Elemax 0-28-26 phosphite, Hydrahume and Subdue for a quarterly application on every palm to keep them healthy and strong. Hydrahume helps with the uptake of nutrients and Elemax has vital phosphorous & potassium nutrients necessary and Subdue & T-Methyl is for root rot fungus and diseases because if the roots have fungus they will not take up water or nutrients.

Another issue noted with scattered coconuts is pencil-pointing which means the trunk is losing caliper as the palm grows.



There is reduced caliper in the trunk on this palm below the leaves which is not normal.

Pencil-pointing is the result of a lack of potassium in the palm. Lack of potassium can be the result of low potassium in the soil or it could be due to palm roots not functioning properly due to root damage from transplanting or fungus from excessively wet conditions. The pencil-pointing I observed seemed to be scattered but it was more prevalent in some of the turf irrigated areas like next to the library. Coconuts by the docks surrounded by pavement also are showing pencil-pointing.

Suggest fertilizer application frequency to be quarterly and consistent to all coconuts so to prevent these type of issues. Another good potassium source is 0-0-22 sulfate of potash-magnesia which is a mined potassium mineral that is used in fertilizer blends but is also favored by golf courses and Zoysia lawn caretakers to supply potassium and magnesium to greens. High potassium fertilizer sources are used in coastal areas if there are high amounts of sodium (salt) in the soil or water.

Suggest applying 2 lbs. of 8-2-12 or 13-3-13 Palm Special fertilizer every 90 days to palms or use 1 lb. of 0-0-22 every 90 days along with drenching Elemex 0-28-26 Phosphite, Hydrahume, and Subdue & T-Methyl at 7 gallons per Palm.

Some of the coconuts had black sooty mold on the trunks. This is the result of mealybug insect feeding on the flower stalks. The mealybugs like scale insects secrete large amounts of a sticky, sugary substance called honeydew. The honeydew sticks to the plant and then a fungus called black sooty mold grows on the honeydew. The sooty mold can be removed from the trunks with careful sprays with a pressure washer. Do not get tip too close to trunk and keep the spray moving across the trunk, do not spray the same spot for more than a few seconds. The black sooty mold can also be removed with a stiff brush and a mild soap or 10% household bleach solution followed by a fresh water rinse. Black sooty mold or algae on the trunks scrapped off easily.

There were a few Rugose spiraling whiteflies present on some of the coconuts in the landscape and the new ones shipped in. Spiraling whiteflies were a huge problem when they first appeared in our landscapes a few years ago but they have dropped in numbers and not much of a problem now. Spiraling whiteflies make white spiral patterns on the bottom of palm leaves and can produce large amounts of honeydew leading to black sooty mold coating surround plants but we didn't see any large numbers of Rugose spiraling whitefly on coconuts. Monitor them is all that is recommended. If they increase we have a formula to control them that only has to be applied once per year in a Basil Drench.

A few of the Pacific fan palms behind the Australian Pines on the SW side of the owner's drive had large amounts of spiraling whiteflies where two leaves were close together shielding the whiteflies from the wind. Trimming the Pacific Fan Palms would remove infested leaves and then a spray with imidacloprid plus Distance IGR would further reduce problem.

There is another issue with the new coconuts planted on the site of the old concrete plant near the maintenance sheds and garage. One coconut trunk collapsed just below the head on the first day of our visit. We dug down to inspect the root ball and found that the soil was a very sticky wet clay. The coconuts are planted a little deep to eliminate the need to stake them. The combination of a wet clay soil plus deep planting can lead to root suffocation and root rot. I found nothing but dead roots on the coconut that collapsed. There is no irrigation in this area and it had rained the week before. The soil was still very wet. A few of the other coconuts in this area look like they are failing.

Coconut roots can be sensitive to poorly drained soils that do not allow air into the root zone. They grow best in coarse sandy soil like what is located on the beach. I suggest that upon planting the hole be enlarged and deepened and beach sand be added to 50% of the backfill around and below the root ball so the new roots have a much better chance to break out and get established. One of the gardeners noted that the coconuts temporarily planted in the beach sand holding area often had new roots growing out of the root ball after a couple of weeks in the beach sand. After planting apply a fungicide drench with Subdue & T-Methyl plus a root-starter fertilizer such as Elemex and Axilo 5 to stimulate positive growth. Compacted ground and old cement in some areas may also be causing problems.

As for the Coconuts already planted that maybe struggling from heavy wet clay soil and planting depth we suggest removing some of the soil on top of the coconut root balls to help the roots breath better and become established. Replacing some of the clay soil with beach sand around the outside perimeter of the root balls should help with new root formation and establishment. Then drench with the Elemex, Axilo 5, Hydrahume, Subdue & T-Methyl at 15 gallons per Palm for initial treatment then stay with the overall recommended Coconut Palm Program.

Oleanders in beds near the main residence had snow scale insects coating the stems. This is a damaging insect that will kill oleanders. Suggest sprays with Mallet (Imidicloprid) & Distance IGR would help. This scale insect is common on oleanders and seems to be more prevalent on bushes kept on the wet side.

Hibiscus beds by the back of the kitchen area have Pink Hibiscus Mealybug which is another pest that has spread around the world. The Pink Hibiscus Mealybug causes distorted new growth on Hibiscus plants called 'bunchy top' when it injects toxins while feeding on plant sap. It is very common in the Caribbean and now Florida. Sprays with Safari or imidacloprid (Mallet) plus Distance IGR work well but damaged tips should be trimmed off as they can be slow to recover normal growth when the toxin is present. Hibiscuses are heavy feeders that should be fertilized monthly to promote best growth. Recommend 21-7-7 acidifier and Ferlene 6 Iron water soluble fertilizer drench. These are products we purchase from Helena Chemical Company. I do believe they do ship to the Islands.

Zoysia Empire turf was located in several areas such as around the main pool and guest cottages. The turf is mowed with string trimmers and it has some thatch build up. The turf doesn't look too bad but it is uneven and spongy. Heavy thatch build up can lead to disease problems during periods of wet weather or cool weather which may not be an issue here.

We usually try to verticut Zoysias in the summer rainy season here in Florida. Empire lawns can be lightly verticut or scalped with a mower set on very low height. Scalped lawns are fertilized with Asset RTU, Axilo 5, Viva & Subdue and treated weekly for 3 weeks after the dead grass is raked up and removed. Water is run a 2 times a day for the next couple of weeks to prevent the turf and soil from drying out as the turf establishes itself.

We believe the Zoysia would look a little neater if it was cut lower with a rotary mower on a regular basis but the windy dry conditions may make it tricky to maintain this way. There were no concerns about the turf expressed to us during our visit. Six applications per year of gypsum (calcium sulfate) can be good for Zoysia lawns in salty conditions. It can be applied at 25 to 50 lbs. per 1000 sq. ft.

There was one bed of Dwarf Ixora in a planter next to the dental office/library building that had yellowing plants. Alkalinity from the concrete used to construct the planter appears to be raising

the soil pH in this bed causing iron and manganese deficiency. Use 21-0-0 ammonium sulfate water soluble and Axilo 5 minor nutrients and Ferlene 6 chelated Iron 12 times per year as a liquid drench fertilizer application. This should help lower pH level and restore color to the ixoras.

Agaves in pots by the gym have some white mealybugs on them. Suggest spray and drench with Mallet and Distance IGR.

Frangipanis are planted in some of the grass areas near the pool house. They are looking dormant now with few leaves. I noticed quite a bit of string trimmer damage to the thin bark on the base of these plants. The gardeners need to use care when cutting grass with string trimmers not to damage the trunks on other plantings. Extra fertilizer may help with blooming on frangipanis. Asset RTU and Axilo 5 monthly drenches are recommended.

A group of Phoenix Sylvestris palms were recently planted in the raised circular bed in the crossroads area near the gas pumps. The upwind sides of the Sylvester palms have salt burn on the leaves. Sylvester palms do not tolerant salt wind well in my experience. Sylvester palms planted near the ocean in coastal Palm Beach county show large amounts of salt and wind damage. The Sylvester palms planted in the bed will get more salt wind exposure as they get taller and will constantly look burned. We would suggest considering moving the Sylvester palms to a more protected area on the island.

Phoenix Dactylifera (edible date) palms by the pool area have been there for years and they handle salt wind quite well. We would suggest considering small Dactylifera palms to replace the Sylvester palms. Another highly salt resistant palm is Seashore Palm, *Allagoptera arenaria* which grows on windy dunes in Brazil. It is a low mounding type palm with silver feather leaves. A few nurseries in Homestead would have this palm which we highly recommend be tried on the island. Palms with silver undersides to leaves look especially good when lit up at night.

Another palm that would do well in the windy salty conditions is Latan palm, *Latania loddigesii*. It is a slow growing silver fan palm similar but smaller than the large Bismarckia fan palms common in landscapes. Latan palms went through the hurricanes in Florida years ago with absolutely no damage from wind or flooding salt water.

Another palm that would do well is the Haitian Cherry Palm, *Pseudophoenix vinifera* or the Florida Buccaneer Palm, *Pseudophoenix sargentii*. Slow growing Caribbean seaside palms with silvery feather leaves, the heads are thinner in growth similar to spindle palms.

There are 4 large Old Man Palms on the east side of Mr. Epstein's residence that are doing well. Some smaller ones could be installed in other areas as interesting specimen palms. There are other Caribbean fan palms in the genus *Coccothrinax* that would grow well here also; one of them is *Coccothrinax alta* which is the only native palm on the Virgin Islands. Many of these have silver undersides.

CHEMICALS THAT CAN BE USED AND ROTATED IN PLACE OF MALATHION:

- 1) Talstar / Bifen
- 2) Sevin
- 3) Acephate (use Abscents a odor masking agent)
- 4) Distance IGR to be added to any of the above 3 products

CHEMICALS THAT CAN BE USED AND ROTATED WITH MALLET:

- 1) Imidicloprid / Mallet
- 2) Safari
- 3) Tristar
- 4) Distance IGR to be added to any of the above 3 products