Plumeria Potpourri

The Plumeria Society of America, Inc.

Come to the January meeting!

Introduction of 2014 PSA Board of Directors

Winter Plumeria Care Q&A Session

Date and Time: *January 14, 2014, 7:30 p.m.*

Location: *Metropolitan Multi-Service Center, 1475 West Gray, Houston, Texas*

Anyone with an interest in plumeria is invited to attend!

Faces of *Corona Surprise*
(photos courtesy of Mike Atkinson)

In this issue ...

January 2014

President's Corner

by **Mark Wright, Texas**

Trying to write this right now is hard. Nostalgia has nothing to do with it. This may be my last "President's Corner," but staying warm is more important to me at this moment than thinking of my tropical plants. By the time you read this, there will be a new PSA President and Board of Directors.

Looking back over my four years as president, I feel as if we've moved forward in some areas. Using our new digital method, eleven new plumeria cultivars have been registered with more to follow soon.

A new website is coming around the first of the year. Many parts of the current website have not been operating, including the option to pay through *PayPal*™. The new site will address many of the problems and frustrations we have dealt with in the past.

My years as president have been challenging and rewarding. I have met many great people and have participated in functions I would not have otherwise. In all honesty, I have enjoyed the last four years. Having help with fulfilling your obligations is a reward not to be overlooked. I have had lots of help with all aspects of this job: articles for the newsletter, the newsletter itself, plant sales, yard tours, the general meetings, etc. Our board members and volunteers cannot be thanked enough for the hours they put in and the job they do.

I will continue to work behind the scenes for the PSA and care for my plumeria trees at home.

The current address for PSA meetings is
Metropolitan Multi-Service Center, 1475 West Gray, Houston, TX 77019

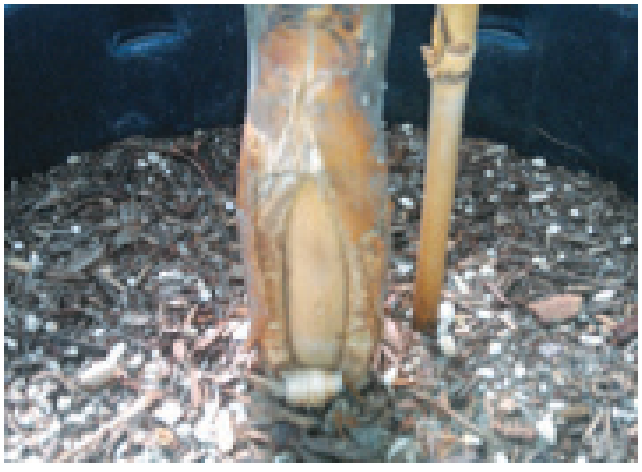
The location will change again when the new garden center at Hermann Park is completed.

Preventing Sunburn—Part 1

by **George Hadjigeorge, Texas**

Plumerias, especially cuttings, get sunburned sometimes. Typically, only a few out of many plumerias sitting next to each other get sunburned. In part 1 of this article, I will explain how radiation of heat works and what kinds of conditions are necessary for a plumeria to get sunburned. In part 2 of this article, I am going to explain how and why plumerias get sunburned at the base of the trunk, which is the most common place where plumerias get sunburned. I will show many examples from various geographical locations and explain why the plumerias got sunburned. In part 3 of this article, I am going to show examples of plumerias that were sunburned from reflection radiation from nearby objects, and I am going to explain why the plants got sunburned. I will also talk about sunburning of plumerias in greenhouses. Then I will give guidelines on what to do to avoid sunburning of plumeria plants and cuttings.

Usually, only the first few inches of the trunk next to the soil line and facing the sun get sunburned (picture below, provided by Mike



Atkinson of California). The back of the trunk (next picture) and the top of the cuttings rarely gets sunburned.

Plumeria tops might get sunburned in hotter desert areas and in greenhouses. Plumeria branches do not generally get sunburned (at least in the

Houston area), even though they are exposed to the sun all day. Clearly, sunburning of the trunk of cuttings and plumeria plants is not due to direct exposure to the sun alone; otherwise, both the top of cuttings and plumeria plants would get sunburned all the time too (they receive the same amount of radiation from the sun as the trunk bottom). For a plumeria trunk to get sunburned, it means that heat coming from somewhere else, in combination with direct heat by radiation from the sun, is overheating the bottom of the trunk. As I will show in this article, this something else is reflection radiation from nearby objects and from the soil surface.

In order to understand why plumerias get sunburned and what to do to avoid it, we need to understand the basics of what radiation is and how radiation of heat works. This is an extremely complex subject, and it is very difficult for non-technical people to understand. I am going to try to keep this subject as simple as possible so that the average person can understand it.

The sun via sunlight warms up the earth. Sunshine is a combination of bright light and radiant heat, which are part of the electromagnetic spectrum. Even though the core of the sun is extremely hot, the radiative surface of the sun (photosphere) has an average temperature of 5800 degrees K. The Inverse Square Law governs the amount of radiation intercepted by the various planets and stars. This law says that the intensity of radiation striking a planet decreases by the square of the distance between the sun and the particular planet. The total energy emitted by the sun at its surface is enormous, about 63 million watts per

square meter. Because of the Inverse Square Law, the amount of sun radiation that strikes the upper atmosphere of earth is only about 1,400 watts per square meter. Why am I explaining this? Because the Inverse Square Law also applies to radiation of heat involved in sunburning of plumerias, and it plays a major role on how plumerias get sunburned. It is the reason why plumerias get sunburned just very close to the soil line and not higher up. The whole plumeria plant would be scorched in direct sunlight all the time if this law of nature were different.

Another important factor to understand, which is a major factor of how plumerias get sunburned, is the difference between sunlight and thermal radiation. Both sunlight and thermal radiation consist of electromagnetic waves. However, sunlight consists of both light and heat, whereas thermal radiation consists only of heat. Thermal radiation is all in the invisible region (mainly infrared) and it is invisible to the human eye. For example, if you are standing next to a fire, you can feel the heat, and it makes you warm even though the air around you is cold. However, you cannot see it. Sunlight can go through a glass or clear plastic window and strike objects in a greenhouse. However, when sunlight reaches objects in a greenhouse, it changes character; it changes to thermal radiation. The reflected infrared radiation cannot go back out through the glass or clear plastic window because both glass and clear plastic are opaque to infrared radiation. As a result, the heat that comes into the greenhouse via sunlight is trapped in the greenhouse and cannot escape—then the contents of the greenhouse heat up. This is called the greenhouse effect and plays a major role as to why plumerias in greenhouses can get sunburned so easily.

Let us now try to understand how thermal radiation works. All objects in the universe that have a temperature above absolute zero emit thermal radiation all the time, day and night. In other words, the earth and all objects on it, emit thermal radiation into space all the time. However, the intensity of this thermal radiation is very low because of the low average earth temperature (about 300 degrees K). The radiation intensity depends on the absolute temperature of the emitting object to the fourth power. On the other hand, the sun's radiation intensity is orders of magnitude higher than that of the earth because the sun radiation-emitting surface is at 5800 degrees K, versus 300 degrees K for the earth. Whenever an object absorbs electromagnetic radiation such as sunlight, heat is transferred. The thermal energy that object emits has a much lower intensity than sunlight. This is how the sunlight that reaches the surface of the earth changes character. Sunlight comes in with high intensity and part of it is re-transmitted back as low intensity thermal radiation, mainly in the infrared region. So, with respect to plumerias, reflection radiation off various nearby objects has relatively low intensity and cannot by itself sunburn plumerias.

Thermal radiation exchange between two objects depends on the temperature difference between them. If both are at the same temperature there is no thermal radiation exchange between them.

The intensity of radiation is a big factor in how much damage to plant tissue it can do and on how long it will take to achieve it. As we have seen, reflected radiation has low intensity and by itself it cannot sunburn plumerias. However objects like mirrors and shinning metals, can deflect sunshine. Deflected radiation has high intensity-like sunlight and could be very damaging. If deflected or reflected radiation falls on the same spot as direct sunlight, the two become additive, even though their intensities could be very different. They will both contribute in raising the temperature of the area they fall on. As I will explain later, this effect is the main mechanism on how plumerias get sunburned.

Radiation can also be concentrated by using a lens or multiple mirrors. A lot of people think that a greenhouse concentrates radiation, and it is the main reason plumerias in a greenhouse get sunburned. A greenhouse traps heat inside, it does not concentrate it. Concentrating radiation involves taking radiation over a large area and concentrating it into a very small area. By doing this you could reach very high temperatures. A mirror does not change the character of sunlight into thermal radiation as most objects do. Putting plumerias close to mirrored things or polished metals could really fry them fast. Plumerias get sunburned by the combination of sunlight and reflected low intensity thermal radiation. Imagine how much damage two times high intensity sunlight will do to plumerias.

Another important factor about reflection heat radiation is the capacity of an object to store heat and its heat transfer properties. So objects near plumerias that have large mass and large capacity to store heat could be a factor in sunburning of plumerias. Other properties such as reflectivity and surface area are also important.

Now let us take a look at what happens with sunburning of plumerias. When two objects, at some distance apart, are at a different temperature, the object with the higher temperature will radiate heat onto the cooler object. The amount of radiation the cooler object receives is proportional to the absolute temperature (in degrees Rankine) of the hotter object to the fourth power minus the absolute temperature of the cooler object to the fourth power, divided by the square of the distance between the two objects. The angle of view between the two objects also has a large effect on the amount of radiation received by the cooler object. I will explain the angle effect shortly. Note that when two objects are at the same temperature, there is no exchange of radiation heat between them. So, when the sun starts shinning on the two objects, it takes a while to heat the objects to different temperatures to initiate radiation exchange between them. So, both the intensity of radiation as well as the duration of exposure matters.

In the case of reflection radiation, the temperature of an object reflecting heat is relatively low, in the range of 100–180 degrees F (like sand on the beach that gets hot from radiation from the sun). Because of the Inverse Square Law, the amount of reflection radiation that reaches the plumeria trunk is relatively small and drops fast with increasing distance. Let's say the trunk receives a certain amount of radiation from a nearby object at 1" distance. Had the trunk been at 2" distance, the trunk would have received ¼th (one over two square) the amount of radiation it receives at 1" distance. At 3" distance 1/9th and at 4" distance 1/16th the amount of radiation it receives at 1" distance. Practically, based on experience of how plumerias get sunburned, reflection radiation in combination with sunlight is not capable of doing much damage past a distance of 4" and definitely past 6" from the emitting object because of the Inverse Square Law effect and the relatively low temperatures involved. Also note that reflection radiation by itself is not capable of sunburning plumerias, because the amount and intensity of reflection radiation is much less than the amount of high intensity direct radiation from the sun. It is when reflection radiation and direct sun radiation combine (fall on the same spot at the same time) that sunburning occurs; the two are additive. In other words, the closer the reflecting object is to the trunk of the plumeria, the more likely the plumeria trunk will get sunburned. However, if the sun hits the surface of the object behind the trunk and reflects radiation onto the back of the trunk that is not receiving direct radiation from the sun, neither the front or the back of the trunk will get sunburn! Why? Because, the reflection radiation that hits the back of the trunk cannot by itself sunburn the back of the trunk, and the direct sun radiation that hits the front of the trunk does not generally sunburn the trunk (except maybe in

extreme desert climates). In order for the trunk to get sunburned, the sun has to shine on the trunk and the nearby object at such an angle that refection radiation from the object and direct sun radiation become additive (fall on the same spot on the trunk at the same time). So, conditions have to be just right for a plumeria trunk to get sunburned. This is why most plumerias do not get sunburned, just a few do.

So the angle of view between the two objects (trunk surface and a nearby object surface) is a very important variable and plays a major role. The angle effect is difficult to understand. In order to explain it let us look at an analogy. Say you are shooting arrows at a square target at some distance away. The target is placed in vertical orientation, and you have a good view of the target. Now let's suppose you tilt the target to be at 30 degrees to the horizontal line. Now you only are looking at a fraction of the original target (its projection to the vertical plane). It is much more difficult to hit it. Imagine now that you are the object radiating heat onto the target. Since the amount of radiation per square inch at the target distance is constant, a lot less radiation will reach the tilted target than the vertical target. Now let us tilt the target to the horizontal position. We no longer have a view of the target, and it is impossible to hit it with arrows. So, in the case of radiation, even though the amount of radiation at the target distance is constant, no radiation hits the target because we have no view of it (radiation travels in a straight line and all the radiation goes right by the target). So, not only the angle of view affects how much reflection radiation reaches the trunk, the angle of view also affects where on the trunk reflection radiation and direct sun radiation hit the same spot and become additive and cause sun burning.

To complicate matters even more, different materials both absorb and reflect radiation, but at different rates. A term called the "total emissivity" is a measure of how much radiation a material will absorb and will reflect. Soil has a total emissivity of 0.8, which means that it soaks up 80% of the heat that is radiated on it from the sun; as a result, the soil surface gets hot. The other 20% of the radiation is reflected onto nearby objects and into space. This is why the sand's surface on the beach gets so hot by the afternoon. Similarly, the soil surface can get very hot, especially if it is not windy and the soil does not lose much heat to the air by convection. For comparison, aluminum foil has a total emissivity of 0.09, which means it reflects just about all the radiation that falls on it (91% of it). For this reason it makes an excellent radiation shield. Aluminum foil in full sun stays relatively cool because the foil absorbs only 9% of the radiation that falls on it. So when the foil radiates 91% of the sun radiation heat that falls on it, the intensity of reflection radiation that falls on nearby objects is very small because of the relatively low temperature of the aluminum foil. On the other hand, the soil surface gets very hot because it absorbs 80% of the sun radiation that falls on it. When the soil surface reflects 20% of the sun radiation that falls on it, the intensity of the reflection radiation is significant because of the relatively high soil surface temperature.

In parts 2 and 3 of this article in future issues of *Plumeria Potpourri*, I am going to use the principles described here to explain why and how specific plumerias get sunburned and things to do to prevent sunburning of plumerias.


Tidadoi

Lemon Drop for the Mayor

by **Emerson Willis, Texas**

Nancy and I bought our first motor home in 1994, and we began traveling around this great nation of ours. I might mention in those very early years, I would carry copies of Jim Little's order blanks to give away. To my knowledge, there were very few plumeria sources available.

Later, my benign madness called "plumeria collecting" was producing a few extra cuttings for me. Also our Florida Keys trips were a fine source of tips.

Very fine plants I love to refer to as "collectibles"; these were being provided to us by a nice old fellow I met and would visit often in Southern California. Come to think of it, as I'm sitting here with my Lenovo at my feet in the year of 2013, maybe he wasn't so old after all.

While Nancy and I were visiting, he might receive telephone calls from people asking him to come chop on their plumeria which was growing through their bedroom window or could blow into their pool. Anyhow, you get the idea.

He would unbolt and remove the rear seat of his van (which weighed at least 1200 pounds), and we would be off to the rescue.

All this gathering made it that much easier for me to begin giving away even more rooted plants on our travels plus planting and placing fine cultivars in the Florida Keys. A typical occurrence: Motoring down the highway, people would see the huge *Mary Moragne* decal on the rear of our bus under which read "Nan and the Plumeria Man" in large print. At the next rest area, we might be asked, "What in the world is a plum-er-ree-ah?" You might guess the rest of this encounter.

As the years went by, more people would at least pronounce our beloved plants name correctly as I gave them a potted one.

Another result of years slipping by is that driving the old motor home isn't as much fun as it once was. We still take it to the Keys, but our annual West Coast trip is in our family auto. This means we can't carry the potted plumerias as we did in the past.

I reasoned that since we couldn't reach as many people in person, maybe we should try to do presentations to higher profile individuals.

I dictated a note to Nan for her honor, Anise Parker, the mayor of my hometown which is the fourth largest city, the second largest seaport in the country, and was the first word spoken from the surface of the moon—Houston. (Texans love to brag and Houstonians can be the worst.) Nan rewrote our note in her flowing cursive on beautiful floral stationary.

A short time later we received a call from City Hall giving us a date and 20 minutes for the presentation.

We caught a few eyes walking around downtown Houston carrying a beautiful blooming potted plumeria and the lei Nancy had strung.

Mayor Parker was so polite and very tolerant of all the information that I had condensed in less than 20 minutes on the PSA's history, plumeria culture, and Elizabeth Thornton's wonderful seedlings.

Of course, I made the lei presentation and had the honor of the traditional kiss.

Driving home we discussed the possibility of our governor, Rick Perry, as our next recipient. Nancy made it very clear she would be doing the lei presentation!

I would like to thank Kathy Huber, the *Houston Chronicle's* Garden Editor, who has helped the PSA for years and years, including the great article on this presentation to the mayor, along with a picture the morning of our Ft. Bend County Plumeria Show and Sale. Needless to say, we had a fine sale and a wonderful time.


Kaneohe Sunburst

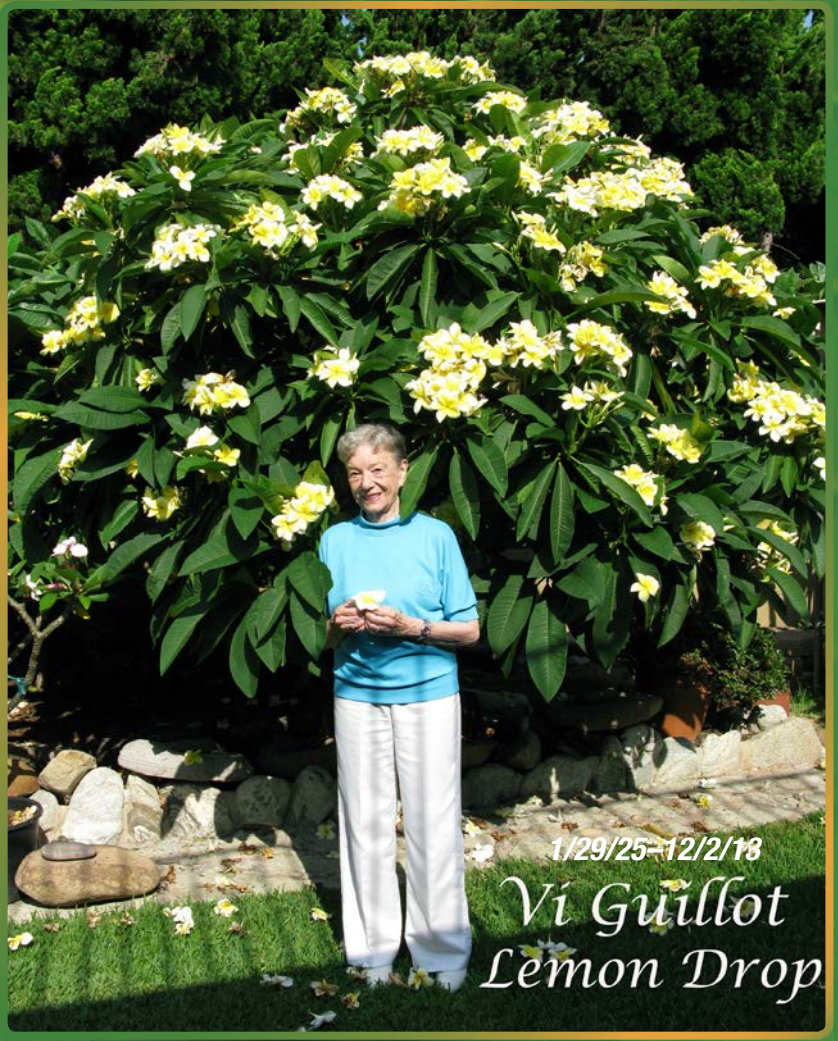

JL Hawaiian Rose


Seedling of Maverick


Dwarf Watermelon


Mango Beauty

In Memory of Viola Guillot



Viola Guillot passed away December 2, 2013. Vi and Bud Guillot were lifetime partners who lived, worked, and raised a family in Southern California.

Over the years, Vi helped Bud with his various plumeria interests. For instance, if a large branch broke off and required a block and tackle to lift it back in place in order to graft it with lag bolts to the parent tree, Vi was always there to work with Bud. When in Hawaii, Vi was along with Bud in finding varieties like Wildfire, Makaha Sunn, and others.

Vi loved plumerias in the natural landscape as they would appear in nature with rocks and driftwood around the base.

When it came to the size of plumeria blossoms, Vi always chose tiny blossoms. On a trip to the Big Island, Vi and Bud found a plumeria tree with a lovely pink two-inch flower, and Vi named it Sparky.

A few years ago, John Ingwersen from Jungle Jacks released a lovely violet-colored plumeria to honor Vi—named Viola G.

The Plumeria Society of America Website

Additional information concerning The Plumeria Society of America and culture of plumeria plants may be found on the World Wide Web at the following address:

JOIN US ON facebook

http://www.ThePlumeriaSociety.org

A listing of currently registered cultivars — Research Committee Bulletins — PSA By-Laws
Plumeria Care Bulletins — Photos from past events — Map links to meeting and sale sites
Photos of plumeria plants and flowers — past color insert pages in PDF format

Purpose of The Plumeria Society of America

(1) Promote interest in and increase knowledge of plumeria hybridization, propagation and culture of plumerias.

(2) Share this knowledge with hobbyists interested in plumerias.

(3) Provide a register for recording, identifying and classifying by name new types and varieties of plumerias.

(4) Encourage and unite plumeria enthusiasts around the globe, throughout America and across the seas.

PSA Calendar — 2014

January 14 ..... meeting

March 11 ..... meeting

May 13 ..... meeting

June 14 ..... Show & Sale I (Seabrook/Clear Lake)

July 8 ..... meeting

July 26 ..Show & Sale II (Fort Bend County Fairgrounds)

October 14 ..... meeting

TBD ..... Fall Social and Luau

- Currently, meetings are held at the Metropolitan Multi-Service Center, 1475 West Gray, Houston, TX 77019. Meetings begin at 7:30 p.m.; workshops begin at 6:45 p.m.
- Bring your blooms. Bring your friends.
- Bring plants, cuttings, etc. for door prizes! These can be anything, not just plumerias.
- Visitors are invited and encouraged to attend.

The Plumeria Society of America, Inc.
P.O. Box 22791
Houston, TX 77227-2791, USA
Dues are $25 per year

Copy this page for all your friends who love plumeria or just want to know more about them.

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Ruby Rainbow
Edi Moragne
My Valentine
Kelly Moragne
Grainy Moragne
Heart of Gold
Musk Rainbow
Champoo Bell