GREATER LAS VEGAS ORCHID SOCIETY

SUNDAY, MARCH 6, 2005 2 PM

THE MEETING WILL BE HELD IN THE USUAL PLACE, THE NEVADGARDEN CLUB BUILDING, WASHINGTON AND TWIN LAKES. THE BUILDING WILL BE OPEN AT 1PM.

Carol Siegel, Newsletter Editor

CAROL SIEGEL- PRESIDENT
CLARICE DEAN -VICE-PRESIDENT
EILEEN MCKYTON- SECRETARY
DIANA SMITH- TREASURER

AND...

Dan Mumau, Michael Lawless, Marsha Hawley - Membership Hospitality Chairmen
Eileen McKyton and Dan Hawley- Welcome Desk
Lillian Patterson- Photographer and Historian
Dan Mumau and Tony Billitere- Raffle Chairmen
Phyllis Bond, Leslie Doyle, Shelly North and Eileen McKyton- Special Events Chairmen
Jeri Lee and Tony Billitere- Community Liaison
Alex McKyton -Building Chairmen and Webmaster
Tex Severance and Mike Levin- Show and Tell Gurus
Tex and Gidget Severance- Judging Chairmen
Scotty Nogaim- Election Chairman, Raffle Lady
Steve Ninemire Library Chairman Clarice Dean, Assistant Librarian
Clarice Dean- Trip Chairman
John Haydukavitch-Video Chief
Shelly North-Classy Club Apparel Chairlady

March 6, 2005 Jerry Fischer "The Orchids of Borneo"
March 25-27, 2005 Easter Show at the Cal
April 2, 2005 Spring Flower Show
April 3, 2005 Mike Glikbarg, Orchids of Los Osos "Odontoglossum &Oncidinae"
May 1, 2005 Dr. Joseph Arditti "Techniques Orchids Use to Survive in the Wild"

June 5, 2005	Sue Fordyce, "Sophronitis and Her Sisters/Orchid Sign Language"
July 10, 2005	SECOND SUNDAY Sheldon Takasaki, Carmela's Orchids, "Cattleyas"
August 7, 2005	Barbecue
September 11,2005	Doug Conkin, "Planning and Developing An Orchid Collection"
October 2, 2005	Virtual Greenhouse Tour
November 6, 2005	"The Adventures of Dennis D'Allesandro in Bolivia"
December 4, 2005	Sixth Annual Holiday Party
Sometime 2006	Fred Clarke, "Cycnoches, Mormodes, And Catasetum"
March 5, 2006	Doug Conkin, "Integrated Pest Management"
April 2, 2006	John Salventi, "How to Grow Award Winning Plants"
May 7, 2006	Harry Phillips, Andy's Orchids, "Tiny Treasures" (the Pleurothallidinae)
August 6, 2006	Barbecue in Mt. Charleston
November 5, 2006	Bill Bergstrom, "The Orchids of Mexico"
December 3, 2006	Seventh Annual Holiday Party

++

Time to pay 2005 DUES- $25 for an individual, $35 for a couple. Pay at the February meeting, or mail your check made out to GLVOS to: Carol Siegel, 8601 Robinson Ridge Drive, Las Vegas, NV 89117. Don't know if you paid? Look at your address label-05 after your name means you're paid, 04 means you are not paid yet, and an * means you have never paid and were a guest. Many thanks to LESLIE DOYLE for designing and providing very beautiful 2005 membership cards. Congratulations to Leslie, too, on being named editor of the SILVER STATE GARDENER, the Nevada Garden Club Publication. They are so lucky to have this talented lady!

We had great fun at our February meeting, another gathering of the clan for a day of fun, food, flowers and friendship. Every one of our speakers has marveled at our warm and caring group—and what a good time we have. Proving once again that orchids are even more fascinating than football, we had a big crowd- even on Super Bowl Sunday. We welcomed new members Jean Moriki, Felicia and Vincent Gassen, Marilyn Short, Carolyn Jones, Sally Pollock and Tuyet Vu. We are pleased to have you! We were really glad to see Roland Hui again after his successful surgery last year. A special thank you to Dan Hawley who handled the rush at the front desk as new and old members arrived and to Diana Smith who kept all the money straight. Marsha Hawley did a great job selling plants, and Eileen McKyton cleaning out the back storage room while everything else was going on!

VALENTINE GIFTS

As a special Valentine present, the club distributed adorable sample bags of Aussie Gold, complete with ribbons and heart-shaped lollipops. The lollipops are to eat, and the Aussie Gold potting mix is for your orchids. Want some more? The club will be selling this wonderful potting mix at the meeting.

GORGEOUS ORCHIDS

Daniel Vong, our angel, was kind enough to let us sell his orchids since he couldn't make it to the meeting. We made $150, and we thank him, once again, for his kindness to us. Our raffle table was overflowing with lovely plants from our speaker, potting mix I donated, plants from Diana, and extra samples of Aussie Gold. We made $100 profit on the raffle table. In addition, Mike Levin sold some of his special paphs. Tex Severance and Mike presented our tables of beautiful blooming orchids. Thanks to everyone for the great support.

FOOD ANGELS

We thank Jackie Braverman, Eldine Stevens, Becky Biondi, and Pat Holland for the great food for the meeting- delicious lasagne with adorable table decorations. We thank Carol Spencer, Melissa Knight, Shelly North, and Marsha Hawley in advance for their kindness in preparing next month's food. We still need two angels to volunteer for April and three for May. Men are allowed, too!

SPECIES OF THE MONTH

Clarice Dean presented our Species of the Month, *Cattleya harrisoniana* and sold plants. This easy bifoliate species (It has two leaves!) can grow to 20 inches tall and bear 2-3 inch rose-colored flowers that are yellow and violet at the tip. Growing in swampy areas in Rio de Janeiro, they like warm temperatures, bright lights, and high humidity. Give them less water in winters and make sure to pot only AFTER new roots appear.

ORCHID SHOWS

There are some really good shows coming up. We will be participating in the Easter Show at the Cal, March 25-27 with the Torrance Cymbidium Society, our wonderful sister society, at the California Hotel. We will be having a display and AOS judging. We hope you will participate. We won three AOS awards last year, and you can, too, by bringing your plants down. We will also be putting in a display at the Spring Flower Show at the Garden Club Building on Saturday, April 2. Please sign up at the meeting to help with these fun events.

The Santa Barbara Orchid Show will be held March 4-6 and is also a wonderful event (www.sborchidshow.com). Shows are great places to hear lectures, buy orchids, see displays, and have a lot of fun.

UPCOMING SPEAKERS

Take a look at our speakers for 2005- and unbelievably for 2006. (I can't help it... I am very compulsive...) I have just gotten Fred Clarke to agree to speak in 2006 on cycnoches, mormodes, and catasetum, a fascinating group. John Salventi of Parkside Orchids will return with a culture talk on how to grow award-winning plants. Doug Conkin will speak twice in the next year or so, once on integrated pest management and once on how to develop an orchid collection. Harry Phillips, the great speaker who taught us how to mount orchids, will return with a talk on the tiny treasures that Andy's Orchids specializes in, all those great plants that take up no space. Sue Fordyce will speak on sophronitis and her sisters, and Sheldon Takasaki will teach us to grow cattleyas. Dennis D'allesdro will take us on an adventure into the world of Bolivian orchids, and next month's speaker, Jerry Fischer, owner of Orchids Limited (THE place to buy weird and unusual and beautiful orchids) will fly in to speak on the great orchids of Borneo AND bring his great plants. AND there's more...

ALAN KOCH AND ORCHID GROWING FOR DUMMIES (&US, TOO!)
Our February speaker Alan Koch of Gold Country Orchids grows charming mini-cattleyas in a dry area of Central Valley, California had controversial- but interesting- cultural suggestions. He uses only New Zealand sphagnum moss, which he prefer "to the cheap Chinese kind..." He puts a loose collar of moss just around the top one inch of the mini-catt in a clay pot, leaving the rest of the roots to dangle free in air in the pot. That's right!! THEN, he pours 3% hydrogen peroxide straight from the bottle through the recently repotted orchid. He only does this at the time of repotting. He says that the orchid itself produces 5% hydrogen peroxide at the junction where a leaf has fallen off to prevent infection of the plant. If something has a bacterial or fungus problem, he waters it THREE times with the peroxide.

He is also most fond of foliar feeding, meaning he sprays micronutrients on the orchid leaves rather than macronutrients at the roots. Many plants, he claims, have sensitive roots that don't like salts and do better with fertilizer through the leaves. He likes to spray seaweed extract on the underside of the leaves in the solution recommended. One time he adds a little ironite and the next time adds a little CMS from Hydrofarm, which has calcium and magnesium. He believes the iron prevents scale.He foliar feeds (sprays leaves) three times for every one time he gives regular fertilzer to the roots. (Dr. Koopowitz thinks orchids absorb just as well through the tops of their leaves so disagrees about the need to water the BOTTOM of the leaves only.) Alan believes when watering the roots that it is essential to use a non-urea source of nitrogen (it says on the packages..). Interestingly, he says that his phals do well in baskets or mounts with their leaves hanging down to prevent crown rot and that growing these plants in the house with reduced humidity seems to prevent diseae. He believes that nutrient absorption occurs in the first twenty minutes, and that plants can be hosed off after that to prevent root and leaf tip burn. He is fond of spraying diluted rootone to the underside of the leaves of distressed plants to encourage growth.

Following the newsletter are THREE items. One is an article I wrote called "In Praise of Phalaenopsis." The other is a poem reprinted with kind permission of our June speaker, Sue Fordyce. The last, written with kind permission of Doug Conkin, is part IV of his article on Integrated Pest Management (ORCHID DIGEST, OCT 1997, PP.198-202) Enjoy!! See you in March. Stay safe and keep blooming!
Love, Carol 254-4168 growlove@cox.net

In Praise of Phalaenopsis

by Carol Siegel

Have I got an orchid for you... Gorgeous, cheap, reliable and undemanding, phalaenopsis are an ideal plant for the desert grower. I sing the praises of phalaenopsis.. Standing in my greenhouse garage this morning, I was surrounded by dozens and dozens of phalaenopsis, spikes elongating, flowers opening in a riot of color. If you don't grow phalaenopsis, you are missing out on a lot of pleasure. If you can't flower anything else, you probably will be able to flower phalaenopsis.

THE STAR OF THE ORCHID TRADE

Phalaenopsis have quickly become America's favorite orchid. In 2002, as much as 90 percent of the $250 million retail sales of orchids sold in the United States were phalaenopsis, and it is obvious why. Sold in every supermarket and hardware store, phals are inexpensive, beautiful, and long lasting. They require very little light and will thrive in a windowsill or under fluorescent lights. They come in a variety of colors and can easily be re-bloomed in a variety of environments with minimal care. Their reasonable price makes them more affordable than cut flowers, and, although many throw them out after blooming, a little attention will keep them blooming for years. Growers love them, too, since they can often be brought from flask to bloom in just 18 months.

For us, phals are a lot of fun. From the time the spike emerges, three exciting months pass as the flowers form. From the time the first flower opens, the spike remains open for the next two to three months. Then, if you cut the spike above the first, second or third "node" or dormant bud (the rings around the stem), it may often bloom again, a whole new spike to repeat the process. It is a plant that loves to bloom, and we love to buy and grow it.

WHERE PHALAENOPSIS COMES FROM

Phalaenopsis grow in a semi-triangle from Sri Lanka to Northern India, across Southern China to Taiwan, then south to the northern Cape York point of Queensland, Australia, and back northwest across Java and Sumatrana. They are epiphytes growing on mossy tree branches in warm humid jungles. Want to make a phalaenopsis happy in your home or greenhouse? Give them what they had long ago when they were growing in nature- warmth, humidity, dappled light.

WHAT CULTURAL CONDITIONS PHALS LIKE

Phalaenopsis orchids like the same kind of conditions people like. If you feel comfortable in a room, your phals will probably feel that way, too. Give them gentle breezes and moderate, moist air, and they will be happy. These orchids prefer the 50-70% humidity we can provide with misters, misting, humidifiers, foggers although they can be happy in a windowsill sitting on a wet pebble tray. They like to grow on the warm side and prefer not to be much below 60 degrees, even in winter. They don't need a lot of light and do well under fluorescents or in a window-sill that's not too bright- 1000 to 2000 footcandles. Bob Gordon recommends fertilizing them with a balanced fertilizer (20-20-20) at one-quarter strength at every watering although everyone has his own opinion on this subject.

POTTING PHALS

You can pot phals in many mixes. Bob Gordon suggests repotting your orchid once a year in fir bark. Norman Fang of Norman's Orchids recommends New Zealand sphagnum moss, changed every 9 months or so. George Vasquez of Zuma Canyon Orchids recommends inexpensive Chilean moss, while many people love coconut chunks, which have been rinsed three times before potting to remove salts. Lately, Aussie Gold, a diatomite mix, has proven very successful for me, a great choice if you don't like to pot or water too often.

WATERING PHALS

Because they have no pseudobulbs and can only store a little water in their few succulent leaves, phalaenopsis orchids don't like to dry out completely. In nature, they receive night dew, day mist, and plenty of rain in season. Match your frequency of watering to your medium. Bark, especially new bark, needs to be watered every few days, while Aussie Gold and sphagnum moss can go a week or more between watering because they are very water-retentive.

Good drainage is essential. Bob Gordon recommends adding drainage holes with a soldering gun or sharp object. Four-inch pots should have drainage holes that total at least one square inch in area. Six-inch pots should have at least two square inches of drainage holes.

INITIATING FLOWER SPIKES

Although phalaenopsis can bloom at any time, they are in their glory right now. In the fall, in order to initiate blooming, phalaenopsis need to be chilled by 10-20 degrees at night. If you grow in a greenhouse, nature will take care of this change in temperature. If you grow in the house or under lights, a door or window left a crack open will do the trick. A minimum-maximum thermometer, available at such places as Charley's Greenhouse (www.charleysgreenhouse.com), will tell you how cold it got at night. You don't want it to get much below 60 degrees since phalaenopsis are warm-growing flowers, even if they do like a colder time in the fall. George Vasquez of Zuma Canyon Orchids recommends getting the area down to only 60 degrees, but Bob Gordon says to lower temperatures to 55 degrees in the cooling period. Initiating three weeks of cooler temperatures in October will cause nearly 100% of your plants to spike in the weeks afterwards. This temperature drop is essential for reliable blooming. Bob Gordon also recommends an increase in light at this time, too, but I usually decrease my artificial lights at this time, and I have had very good success, too. The lesson? Experiment and see what works for you.

It is common wisdom to give Epsom Salts or magnesium and high phosphorous or blossom-boosting fertilizer in the fall to initiate flower spikes. However, an article in ORCHIDS magazine in August 2004 by Yin-Tung Wang concludes, "There is no need to apply an elevated level of phosphorous to a well-grown healthy phalaenopsis in the autumn for improved flowering... It is clear that applying magnesium at these levels in early-and mid-September did not promote spiking..." It did not seem to do any harm so you can do it if your experience is different from Dr. Wang's. It is always interesting to see if common wisdom meshes with scientific inquiry.

STURDY-FLOWERED PHALS

Every television interview show has a pot of white or pink phals with long arching sprays on the desk. Luckily, we have many other choices today- many more sturdy-flowered orchids with bright colors, bars, and spots. Today, breeding of species and hybrids has produced improved shape and flower count, especially from Taiwanese firms such as Brother Orchid Nursery and Sogo Orchid Nursery. You might like to have a collection with these hybrids—or just collect the species that are their parents. *P. amboinensis* and *P. sumatrana* have jadelike substance and waxy texture. *P. gigantea*, available from Norman's Orchids for $500 (!!), has enormous leaves but a compact inflorescence. *P. cornucervi* and *P. lueddemanniana* frequently produce keikis that can be removed to start whole new plants. They are adorable and very special.

MINIATURE PHALS

Although many phals can get spikes that are several feet high, there are also charming miniature species and hybrids. All phals take up very little space, but these darlings are really space-saving Producing pretty clusters of $\frac{1}{2}$-2 inch flowers, miniatures can flower in 2-4 inch pots. Those tiny hybrids which have *Phalaenopsis*

equestris in their backgrounds are especially suited to growing in bright warm windows or under fluorescent lights. You can grow a dozen of these beauties in the space it takes to grow one big cattleya. They even are said to not require the cool autumn period that most phalaenopsis require. In addition to *Phalaenopsis equestris*, other species that produce charming miniature plants and hybrids are *Phalaenopsis lindenii* (striped flowers with pendent spikes), *Phalaenopsis mannii* (waxy brown and yellow) and *Phalaenopsis amboinensis* (slight larger with brown stripes and waxy texture).

FRAGRANT PHALS

There are even phals that smell good, too. Many of these are hybrids based on *Phalaenopsis violacea*, (also know as *P bellina* lately) an orchid from Malaysia that is so sweetly scented that natives can locate it in the jungle by following its perfume trail. Although the fragrance is not always inherited from its parent, hybrids are often so fragrant that one flower can perfume a whole greenhouse. In a monograph, Eric Christenson says, "*Phalaenopsis bellina* is probably the most fragrant of all species in the genus. If I were to coin a common name for this species, it would be the 'Fruit loop orchid' after the popular breakfast cereal whose fragrance it shares."

Several other phal species are also fragrant and used in hybridizing. *P. leuddemanniana*, known for its waxy cream and dark pink barred flowers, is fragrant on warm mornings, flowering for several years on the same inflorescence. *P. schilleriana*, from Luzon and other islands near the Philippines has a delicate perfume much like roses. Both these can give their delightful fragrances to their offspring.

If you want to buy a fragrant orchid, Norman's Orchids has a website (www.orchids.com) which offers lots of fragrant phals.

Choose "phalaenopsis" and then choose "fragrant-yes" and you will have pages and pages of choices. In August of 2004, Norman even offered a fragrance collection in ORCHIDS magazine.

SPECIES

Some growers prefer a collection with only species. A species represents a population made up of individuals that share a common gene pool. I think of them as the orchids as they grew in the wild. Today, commercially desirable and spectacular plants are bred by crossing species and their hybrids over many generations. Successful crosses have also been made between genera- between *Phalaenopsis* and *Ascocentrum, Neofinetia, Renanthera, Sarcochilus, Vanda or Eurychone.*

Growing species can be more demanding than growing hybrids. Hybrids are usually selected for the marketplace becase of their rapid growth, prolific blooming, ease of culture, and beauty. Species, on the other hand, have been adapted to survive in their native habitat, qualities which sometimes makes them difficult to grow in your home or greenhouse. However, they can be very rewarding and fun to grow, and I have enjoyed watching these natural beauties in my own little environment.

There is much to know about phal species. They are divided in Subgenus and Section with special requirements. The ORCHID DIGEST of Ocober 2002 had an excellent issue all about phalaenopsis species. Make sure you get it from our library or the Orchid Digest (www.orchiddigest.com) if you want to grow species.

For example, phal species in the Subgenus Pashisianae like *P. lobbii* need a dry winter rest with much less water and may even drop some of their leaves. People have thrown this plant our because they thought it was dead or drying. This group produces multiple new

growths from the base of the plant which can be removed to start new plants.

Phal species in the subgenus Polychilos, Section Amboinenses like *P. amboinensis, P. bellina, P.gigantea, P. javanica, P.luteola and others* rebloom year after year off the old flower spikes. Do not cut off the old spike as it will bloom again!! The important lesson is that you must read about the specific plant you buy to have real success with species.

When I first started growing orchids five years ago, I was not impressed with phalaenopsis. They were too common. They weren't drop-dead gorgeous like cattleyas, and they weren't exotic like vandas. Now, sadder but wiser, I adore the phalaenopsis. It's common because it is a terrific plant for the imperfect grower. Undemanding, dependable, pretty and rewarding, phalaenopsis is a wonderful plant to grow. I sing the praises of phalaenopsis—and you will, too!

BIBLIOGRAPHY

Fitch, Charles Marden, "Miniature Phalaenopsis," ORCHIDS, January 2003, pp.26-27.
Fitch, Charles Marden, "Perfumed Phalaenopsis," ORCHIDS, August 2004, pp.580-585.
Fitch, Charles Marden, "Sturdy-Flowered Phalaenopsis," ORCHIDS, October 2003, pp. 744-747.
Gordon, Bob. CULTURE OF THE PHALAENOPSIS ORCHID. Laid Back Publications, Rialto, Ca., 1990.
Tuskes, Paul and Ann, "Culture of Phalaenopsis Species," ORCHID DIGEST, October, November, December 2002, pp. 165-193.
Wang, Yin-Tung, "Flowering Phalaenopsis," ORCHIDS, August 2004, pp.602-605.

BIRDS OF A FEATHER

Susan Fordyce, Fordyce Orchids

Orchid Folk are very quirky
With their own set of mismatched gears-
I've observed quite a few of the "Orchid Flock"
Throughout these many years.

There is that plumed ***Broad-Beamed Aisle Waddler***
With giant handbag lugged in tow-
Her plumage may be pretty wild
But her progress is very slow.

In her wake- Oh what a mess!
Broken pots and bark everywhere-
You can tell she's barreled through the place
Breaking spikes without a care.

Among my very favorite fowl
Is the ***3 Toed Dodo Bird-***
His feathers are plain and somewhat sparse
And, well... he looks somewhat absurd.

His bumpy, balding pate is the result
Of searching under tables-
'cause his orchid tags seem to disappear-
and he's lost almost ALL his gosh darn labels!

And here's a bird with a natty crest
And a puffed up sense of pride-
The ***Triple Crested Bud-Boaster***
He's NOT shy, I must confide!

In fact, he's known to goose-step after
(and bore to death)
The long-suffering Orchid Flock-
His crowing can be heard both far and wide-
(But most of it's a crock...).

Another judgmental turkey
That gets my pin-feathers in a twist
Is the ***Bobble-Headed Nit Picker***
He REALLY gets me.... (madder than
a wet hen)

For years I've coddled and I've nutured
My favorite, lovely orchid gem-
And he pecks apart it's many virtues-
And I'd like to HEN PECK HIM!

Have you spied the ***Toe-Tapping Spiteful Snippet?***
(I think she's related to the Grumpy Grouse)-
Under her feathers lie sharp dorsal spurs
Which she digs into her orchid shopping
spouse.

There is a sparrow of a little bird
A ***Red-Eyed Wing Wringer-*** *all fluff*
and flitter-
Who frets and fondles over every leaf
And each spot or wrinkle causes her to twitter.

The ***Pot-Bellied Nuthatch*** *is a slow*
witted, beleaguered fowl
Who can never make up her mind-
Don't shop with this wishy-washy bird brain
Or you'll ***always*** *be behind!*

She's a lot like the ***Tight-Toed Greenback Hoarder***
Who looks and looks and looks some more-
And she'd be in Birdie Heaven if she
could roost
At the Orchid "Dollar Store"!

I have to mention this one large bird
Who is as sharp-eyed as an eagle-
The ***Tufted-Earred Species Spotter*** *snatches*
up his ***PRIZE****-his* ***PREY-***
(and finds out later it was illegal...)

Yes, my fine, feathered friends, the orchid flock
Are a quirky bunch, it's true-
And I'd like to know, my little dove-
Which rare Orchid Bird are ***YOU****?*

INTEGRATED PEST MANAGEMENT FOR THE ORCHID HOUSE—PART III

DOUGLAS E. CONKIN

When All Else Fails...

Next, let's take a look at the subject you have all been waiting for, **insecticides.** I have purposely held off on this subject for all this time because I wanted everyone to realize that there are many things we can do before we get out the heavy hitters. I also wanted to get everyone to think about prevention first. Prevention is always easier than cure.

In this segment, we will talk about some definitions, proper procedures for application, and finally, some recommendations for natural/organic pesticides, along with specific instructions about the use of each where it is needed.

Definitions

What do we mean when we say that an insecticide is natural or "organic"? I personally think a lot of thought needs to go into these terms. We should keep in mind that the word "organic" in the true meaning of the word simply means that the product was, at one time at least, alive or contains the element carbon. So, by that definition, crude oil is organic; gasoline is organic; organophosphates such as **malathion** are "organic." As you can see, this definition is far too broad for our purposes.

"Natural" is another problematic word, although it may be somewhat better. It carries the same problems that "organic" does. Perhaps the best terms for our purposes are **botanical, mineral** and **chemical** pesticides. These are more specific and speak directly to the source of the pesticide we are talking about. I think it is a good idea to go over the key definitions at this time.

Botanical—a botanical pesticide is one whose sources are directly from a plant. The stems, roots or flowers may be the actual source of the poison. The plant is processed only insofar as is necessary to extract the poisonous material; this may be done by drying and grinding the stems into a powder, making a tincture, or by extraction. Examples of botanical pesticides are pyrethrin, rotenone and sabadilla.

Mineral—as the name implies, the source of this group of pesticides is mineral. This is a fairly broad term as it includes (to my thinking) soaps and horticultural oils. In this case the raw minerals are ground into a powder, dissolved and mixed into a liquid form, or sometimes mixed with other products into a liquid form. Examples in this class would be sulfur dust, copper, diatomaceous earth and horticultural oils.

Chemical—this class of poisons is chemically manufactured products. In this case the poison is made by combining a group of ingredients, produced artificially, into a final mixture. Although the original model for these chemicals may occur in nature, these products are not "natural." They are made by finding the active part of the naturally-occurring substance, submitting it to chemical analysis to discover its precise chemical nature and then reconstructing it using the pure chemical equivalents. As an example, think about penicillin. Penicillin is derived from a mold, but we do not take tablets full of mold spores. Rather the active ingredient that kills bacteria was isolated and a chemical synthetic made of it. It is this chemical synthetic we take when we are sick. This process results in a much stronger poison that will remain effective for a longer time. It also means that the poison is harder to get rid of in the environment. Examples of pesticides in this class would include Malathion, Orthene and Cygon.

Procedures For Applying Pesticides

While the procedures for using various pesticides will vary from product to product, there are some general guidelines I will include here. First and foremost, I want to stress that these products, regardless of their source, are **poisons.** Just because they are obtained from plants and minerals does not make them any less dangerous and does not mean that you can take their use lightly. Botanical and mineral pesticides are preferable to chemical poisons because they are generally not as strong and are more selective in their killing action. For the most part, they will not kill beneficial insects. Botanical and mineral poisons also do not remain in the environment for a long time, making them more environmentally friendly. They generally degrade very rapidly and therefore will not collect in groundwater, soils and body tissues. Also, most of them will not kill your pet, should your favorite animal accidentally ingest them. However, you must use the same cautions when using them as you would if you were using a chemical poison.

1. Know your enemy. Before you do anything else, make sure you have identified the pest you are about to kill. You should not do some kind of random spraying, hoping you have used the right poison to address the problem. I realize that some pests, such as mites, are extremely small, and that you may have a hard time finding them, but do the best you can. A small handheld jeweler's loop (16×) will help a great deal. There are many books that are well illustrated and will help you with any problems you have with identifying your problem. Every home library should have at least one such book.

2. Plan your application program. Take some time and plan out your approach. Think about what kind of insect you are dealing with. Each insect will have a particular pesticide that will work best for it. You should also know the life cycle of the pest you're dealing with. Consult your reference books to find out how quickly the pest reaches adulthood, the various stages the insect goes through before adulthood, etc. This will help you plan how closely to repeat your applications. Remember, just one application of **any** pesticide will not do the job. You will have to apply all pesticides three to five times depending on the pest. You should not use the same pesticide more than five times in any given application program. Generally, plan to change to another product after the third application or the next time you need to use a pesticide. Using the same product over and over will lead to insecticide resistance on the part of the insect. At the risk of repeating myself, knowing the life cycle of the pest will really help you win the battle. Consult those books and pamphlets often. Now that you have identified the pest and know something about its life cycle, sit down and think about the pesticides available to you and which one you think will work best for you. Plan when you will make your first application, when to reapply and when to stop. Once you have made your decisions, it is a good idea to write them down. If you already keep a greenhouse calendar, write your plans on it. As you complete each task, you can cross it off on the calendar.

3. Read the instructions! I know this may seem silly, but we all get careless from time to time, and our memories are just not as good as they used to be (the older I get, the more I find this to be true. It makes me wonder what my mind will be like when I'm eighty!) No matter how long you have been using a product or one similar to it, you should always re-read the instructions. Misapplication of a product could result in damage to your plants or injury to yourself. Be careful and wise, always read the instructions **in their entirety** and follow them to the letter. Mix and use the product exactly as indicated on the label. Never make a "witches' brew" of insecticides. It is always better to be safe than sorry.

4. Wear the proper clothing. When you are applying a spray or dust, be sure to wear long-sleeved shirts, long pants and good solid shoes. Also wear rubber gloves, not cloth. Don't go out to spray wearing a T-shirt, shorts and sandals. Many products can be absorbed through the skin. A dust mask should be worn; this will prevent you from inhaling the poison. If you need to wear a respirator, that advice will be in the caution section of the instructions. Follow that advice. Goggles are always a good idea, as the tissues of the eyes can absorb the insecticide quickly and easily. You should always wear them when applying a insecticide.

5. Check your equipment. Be sure all the nozzles and stems are clear and pump mechanisms are functioning properly **before** you fill the reservoir with the pesticide.

6. Mix carefully and mix only what you will need. Take your time, measure carefully and mix well. Use tepid water (about 72°F to 78°F) to mix with unless directed otherwise. The manufacturer's tests on the products are usually done with room temperature water, and the instructions are geared to those conditions. Using hot water or very cold water may change the chemical structure of the insecticide and interfere with its action. Also, you should use the minimum amount of pesticide listed in the instructions. You can always increase the strength to the maximum amount later if need be. Keep in mind that many of these products may not have been tested on many types of orchids, if they are tested on orchids at all. Almost certainly they will not have been tested on plants such as lycastes, catasetums, etc. These thin-leaved plants burn very easily, so be very careful when you use any type of pesticides on these types of orchids.

7. Apply pesticides in the early morning when it is cool. It is not a good idea to spray anything—even water—directly upon a very warm leaf. This practice can cause tissue collapse and shock. You should always use pesticides in the cool of the morning or in the cool of the evening. Never apply any pesticide in full sun in the middle of the day or when the temperature is over 85°F. That is asking for trouble of a major kind. Before you begin to use a spray or powder, turn the fans in the greenhouse off. If you are treating an outside area, wait until it is calm. There should be as little breeze as possible. This is to prevent the insecticide from blowing where you may not want it and to keep it from blowing back in your face.

8. Be thorough when you spray. Make sure you cover the affected area well. Be sure to spray the underside of the leaves as well as the top of the leaves. Cover the base of the plant also. When using a powder such as sabadilla, be sure the powder gets on the underside of the leaves as well. If you have chosen a powder, it will help if you mist the plants **lightly** before applying the powder. This will help the powder to stick.

9. Make only as much as you will need for that use. If you have left over, you should pour it into a bucket and dilute it with water. Most liquid botanical and mineral pesticides will degrade rapidly in full sun. Place the bucket in full sun out of the reach of children and animals. Let it stand a couple of days, then dump the solution on the ground, well away from any water source. Do not pour it down the drain or sewer!

10. Wash and change your clothes. After you have finished your work, a complete shower is a good idea.

For the gentlemen who have a beard or mustache be sure to shampoo them thoroughly. Rinse well.

Now that we have this out of the way, let's go on to the list of botanical and mineral pesticides available to you.

Oil Sprays

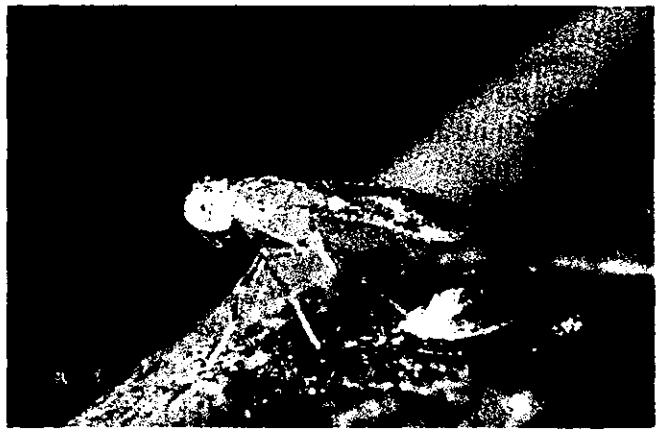
Once known as dormant oils, these products are descendants of the old oils used on fruit trees. These older types of oils were heavy petroleum oils and were used in the early spring before trees leafed out to kill insects and their overwintering forms before the season began. The new light oils such as SunSpray Ultra-Fine Oil have been developed for year-round use and show very little, if any, phytotoxicity. They kill insects by suffocating them with a fine layer of oil. Oils have the added benefit of killing insect eggs and larvae also, something most other insecticides will not do. These oils are sold as superior or ultra-fine oils and **must** contain at least 92 percent unsulfonated residues and no more than 8 percent sulfonated aromatics or impurities. If you are in doubt about whether or not the product you are considering meets this guideline, read the label. The contents will be listed on the label. These oils will control aphids, mealybug, mites and **scale.**

Precautions: While these ultra-fine oils are tremendous products, like all pesticides, they are not without their problems. Oils should never be used on dry or water-stressed plants. Always water the plants well the day before you plan to use the oil. Always spray in the cool of the morning or evening. **Never, never** apply these products in the middle of the day or when temperatures in the growing area are expected to go over 85°F. When used in the heat of the day they will cause damage to leaves, buds and flowers. Used properly, they will not damage the plants. Never mix with products that contain sulfur; if you use sulfur dust to control fungal infections, do not use oils within one month before or after the application of sulfur. Use caution when spraying spikes and buds; do not spray buds of vandas, ascocendas or their hybrids. In my experience the only damage to buds or emerging flower spikes I have ever had was on ascocendas, but I would use caution on any buds.

How to use: Prepare the concentrate at the lowest concentration listed. Mix well. The mixture should be shaken or stirred several times during the application. For best results, put the required amount of oil in the container first, **then** add the water. This product is one of two exceptions you can use hot water to mix with. Hot water will give you a smoother, more complete mixture. Thoroughly coat all leaf surfaces, including the undersides, until solution drips off the leaf. When you are using oils on thin-leaved orchids such as lycastes, be sure to test the oil by spraying one or two leaves. Wait a day or two to see if the leaves will be damaged. You will notice small, dark, somewhat oily looking spots on the leaves. This is **not** oil damage. These are places where mites or other sucking insects have penetrated the leaf surfaces. The oil will penetrate through this minute hole, causing this slight darkening. The type of damage we are looking for will be dry patches on the leaf edges, spreading into the leaf, or patches that look like sunburn. You should have no problems if the instructions regarding the time of day for application are followed. Do be careful with new growths on lycastes, catasetums and the like. As you probably know, the new growth on these plants is very delicate and sensitive to any type of insecticide/fungicide. It is probably best to shield them somehow during the application.

Pyrethrin

This is a botanical poison made from the flowers of *Chrysanthemum cinerariifolium* and *C. coccineum.* It may



Max Badgley/Biological Photography

Aphytis melinus—scale predator

be purchased in several forms: the dried and crushed flower heads are called **pyrethrum;** the extract is **pyrethrin.** The synthetic version, **pyrethroids** are a no-no for our purposes. Pyrethrin is a broad-spectrum nerve poison; it kills by destroying the nervous system of the insect. It is effective against aphids, mites, whitefly and many types of worms and beetles.

Precautions: This product is moderately toxic to mammals, and it is deadly to ladybugs. People with allergies to chrysanthemums should use caution when using pyrethrin in any form. Pyrethrin is most effective when temperatures are below 80°F. Consequently, it should also be applied in the early morning.

How to use: Mix according to the instructions. Again, be sure to coat all leaf surfaces thoroughly with the spray. The product is available in liquid and powder form, both alone and in combination with insecticidal soaps and rotenone.

Rotenone

Made from Peruvian cubé or Brazilian tembo plants, rotenone was once widely used in organic gardening as it was considered safer than chemical controls. However, because of its highly toxic nature, it has

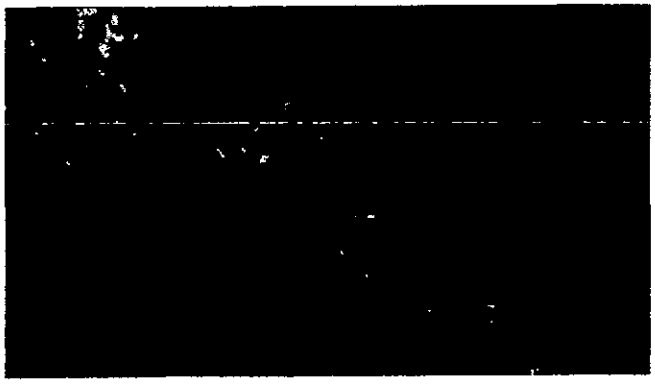
been supplanted by less toxic substances. It does have excellent "knock down" capabilities and may be very useful for heavy infestations. It is most effective against insects with chewing mouth parts, such as beetles, less so against sucking insects. Rotenone is available alone as a powder and in a very effective combination spray with pyrethrins.

Precautions: Not to be redundant, but rotenone is highly toxic! It will kill most beneficial insects, so be careful with it. If you have spent a season building up a beneficial program, don't use rotenone. Rotenone is also very toxic to birds, fish and swine. Never dispose of it in waterways or ponds. If you keep birds or encourage them in your garden area, be very careful not to get any of the spray in baths, food containers or drinking receptacles. Fishponds should be watched carefully and covered if necessary. Pot-bellied or any other pigs should be protected. Humans should be sure to wear goggles, gloves and thick clothing. A respirator is also a good idea, but a dust mask will suffice.

How to use: Clearly, from the above precautions, you should be very careful with this substance and use it only when you must. It should be prepared and used according to the instructions, always starting with the lowest dose. I have never used the dust form, preferring the liquid combination with pyrethrins. I never use it as a general spray for the whole collection, only as a spot spray within a problem area. Since I use lots of beneficial insects, I am not crazy about this product. It is certain death for mites, however.

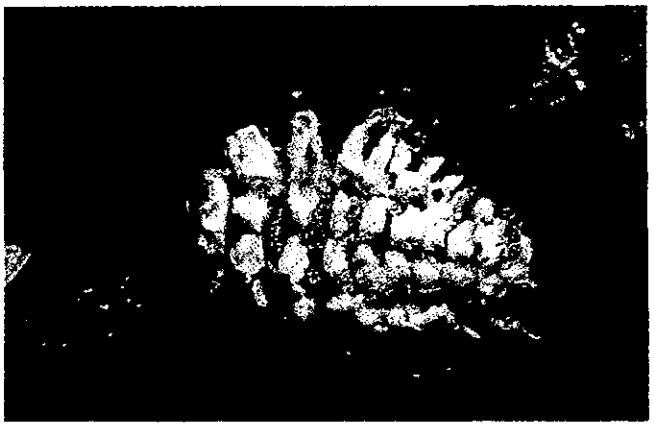
Sabadilla

This botanical poison is derived from the seeds of *Schoenocaulon officinale*, a lily-like plant from Venezuela. It is an alkaloid poison which affects the digestive tract of the insects. Sabadilla is effective against aphids, thrips, mealybugs, beetles, several species of moths and worms. When other botanicals fail, sabadilla will often do the job.



Metyphycus helvolas—soft scale predator

Precautions: Sabadilla is moderately toxic to mammals, and can cause violent allergic reactions in susceptible people. It will not harm most beneficial insects. Ladybugs are the exception, as they are



Max Badgley/Biological Photography

Cryptolaemus montrauzieri—larvae
(note close resemblance to mealybug)

members of the beetle family. Sabadilla will also kill honeybees. Any application of this product should be made when honeybees are least active. When sabadilla is kept in a dry, dark storage area, it becomes stronger with age. It will break down quickly in sunlight.

How to use: Sabadilla may be used as a dust or mixed with water to make a spray. Prepare the spray according to package directions. Sabadilla must be screened through a very fine mesh strainer, gardener's cheesecloth, or a nylon stocking to prevent the hulls from clogging the sprayer. Agitate the liquid frequently to keep the substance in suspension. In this case, mixing with insecticidal soaps is allowed. The soap is a great wetting agent and will help keep the sabadilla in suspension. As always, spray thoroughly. Don't forget the undersides of the leaves.

Neem

These are the various products made from the neem tree, *Azadirachta indica*. The active ingredient in these products is azadirachtin; it is extracted from the seeds of these trees and acts as a growth regulator. neem stops the insects' growth cycle and kills the larval and pupal stages. After the insect eats neem it stops feeding and dies shortly thereafter. The products made from neem are very broad spectrum, being registered for control of whiteflies, mealybugs, thrips, leaf miners, caterpillars, aphids, gypsy moths, leaf beetles, weevils, leafhoppers, woolly aphids and webworms. No resistance or tolerance has been observed, even with years of continual use. There is no delay in re-entry after spraying. You may go back into the greenhouse as soon as the product dries. The products containing neem currently on the market are **Azatin EC, Margosan-O** and **Safer Bioneem.** Azatin EC contains 3 percent azadirachtin and 97 percent inerts, Margosan-O contains 0.3 percent azadirachtin and 99.7 percent inerts, Safer Bioneem, as might be expected, has the lowest concentration of azadirachtin, only .09 percent with 99.91 percent inerts. Azatin EC and Margosan-O are both expensive ($160.00 and $54.99 per quart respectively), although a little goes a long way. Safer Bioneem is considerably

less expensive, although at $9.99 for eight ounces, it still is not cheap. Given the broad spectrum of insects killed by the products, I expect demand will increase as word gets around. This may make it more affordable. If these products are as effective as claimed, they could be the only pesticide you would ever need to use. According to Harmony Farm Supply in Grass Valley, California, the Safer product should be sufficient for home greenhouse use. I have heard (personal correspondence) that neem products will kill scale and mites; however, note that they are not registered as effective on these pests. In theory, if a product kills mealybug, it should kill scale as they are closely related. However, this is only theory and they are very different bugs.

Precautions: Neem is amazingly safe, especially for such a broad spectrum pesticide. Since it works as a growth regulator, there are no direct poisons in action. I will say that I was rather disappointed in the Safer Bioneem. There are now a number of products made from neem. I would suggest using one of the other products with a higher concentration of azadirachtin. In contrast to most of the synthetic growth regulators, I do feel very comfortable using neem. It rapidly degrades in the environment, unlike its synthetic counterparts. So far, I have not read or heard of any build-up in tissues.

How to use: There are no special tricks in using these products. As usual, be sure to follow the directions to the letter.

Soaps

Insecticidal soaps are some of the oldest pesticides known to man. From very humble beginnings, these very useful products are made today from fatty acids. Soaps kill by penetrating the insect's waxy outer coverings, causing their cell membranes to collapse and leak, leading finally to dehydration. Soaps will control soft-bodied insects such as aphids, mealybugs and whiteflies. It may also be effective on mites, scale and thrips, although you may need to use one of the special soaps specifically formulated for these pests.

Precautions: All soaps may damage buds and new growths of thin-leaved orchids. When in doubt, test first and come back with a full application later.

Although soaps are very safe for the environment and non-toxic to humans and other higher animals, they will kill some beneficial insects as well as pests.

How to use: Soap sprays are simple to use. Prepare them according to the directions on the container. As with oils, place the soap in the container first, then add water for a better mix; you may also use hot water with soaps for a better mixture. You should also be aware that soaps work best with soft, neutral or slightly acid water (6.8 to 7.0 pH). If you have problem water, you might want to use bottled distilled water. Since a two gallon pump sprayer is the main piece of equipment most of us use, it won't be too great an expense. If you use RO or de-ionized water for your orchids, you should use that water to mix with. These products are widely available both by themselves and in combination with other insecticides. You will have no trouble finding one to meet your needs.

Growth Regulators

Growth regulators represent one of the newest and most promising means of pest control developed in many years. These hormones interfere with the growth cycle of the insect and keep them from reproducing or from growing up. Growth regulators are not poisons in the traditional sense of the word. Most are, however, synthetic reproductions of naturally occurring hormones, and therefore, may not be acceptable to those who wish to maintain a pure "organic" approach. There are many different formulas produced for various pests. These will control fungus gnats, thrips, mites, beetles, etc. I have had direct experience with only one type of this control. I was very satisfied with it, but probably will not use it on a regular basis for the reasons listed below. You should read the product descriptions carefully and choose the one which best meets your needs.

Precautions: Insects and humans have very different biological processes, and growth regulators present no real direct threats to humans. They do not irritate the eyes or the skin. As the insects they control must eat the hormone and they are generally pest-specific, they do not present a very great threat to beneficial insects. That being said, it should be pointed out once again that these products are synthetic hormones. A good deal of research is being carried out at the present time on ambient hormone levels in the environment and their negative effects on animal life (including man). For example, studies worldwide are drawing attention to elevated levels of estrogen in the environment. Estrogen is used in a surprising number of products for a wide variety of uses. It has had a profound effect on the reproductive behavior of many diverse animals, including alligators in the Florida Everglades, big cats in the tropics and wolves in Russia. As research continues, it would not surprise me if these products were eventually banned. I think we should examine our goals and consciences carefully before using these products. Personally, I have made the decision to use them only if I am faced with a particularly cantankerous pest such as Boisduval scale and only when all other avenues have been exhausted. I think they are better than Orthene or Cygon, but I am not comfortable with their possible long term effects.

How to use: As I stated above, I have had little experience with these products, so I cannot offer much solid help about their use. Suffice it to say, you should always follow the directions to the letter.

There are many other products available and I would encourage you to try them. All are reliable and will certainly go a long way towards reducing the toxic load our planet must bear.❖

Douglas E. Conkin
2264 East Glenoaks Boulevard
Glendale, CA 91206