

BONSAI POTTING MIXES or The Real Dirt by Don Waitkus,
from the Lake Charels Bonsai Soccity Bonsai News, January 1996

PART 1

This has been written for the benefit of those who have little or no knowledge of bonsai potting mixes. It started out as a relatively simple presentation, but after compiling information from numerous sources, it turned out that bonsai soil mixtures were not such a simple thing to explain. The experts neither agreed nor provided any logical reason for what they were doing, until now. As a result, this got to be a rather long presentation and will require more than one installment in the newsletter.

While researching, I discovered some very interesting things which were instrumental in changing my thinking about the preparation of potting mixes. Don't get me wrong. I am far from an expert in the matter of soils and have had at least 200 different mixes in the past thirty years. Each one was just a little better than the last, but just not quite right. I've had lots of people tell me what the mix should be, and that's how I got to 200 and thoroughly confused. I've continued to "improve(?)" my blends over the years, but without a good logi-

cal reason for making those changes, except for what someone else offered as the ultimate answer to potting mixes.

What follows is somewhat different, maybe even interesting information on mixes, along with the reasoning for doing it this way. I know that the old hands have their own blends with which they have had some measure of success, and even though they may be unwilling to change, perhaps some of this may prove informative. Much of what follows has been gleaned from the more informative bonsai texts and personal experiences.

POTTING SOIL? This article has been purposely entitled **BONSAI POTTING MIXES** to get the word "soil" out of your mind. "Soil" is what you plant your tomatoes and corn in and where nematodes and mole crickets live. Bonsai potting mixes do not remotely resemble soil. Bonsai potting mixes are typically unique blends of organic and inorganic substances which are formulated to provide the best growth and health environments for plants which will live their entire lives in relatively small containers.

BACKGROUND INFORMATION. Useful information about bonsai mixes is not easy to come by. Most enthusiasts have their own little "secret" and may be somewhat reluctant to share it. Others share too easily; still others expound on fancy theories which only tend to confuse the hobbyist. Some folks will even tell you that you will eventually develop a blend of your own. These folks may be well intentioned, but are afraid of any difficulty which might ensue, if what they've told you does not result in success.

This lack of "informative" information is especially true of most bonsai texts. It becomes readily apparent that each author has his own particular way of dealing or not dealing with the mix issue. They give you a formula that can only be

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EDITORIAL by Jules Koetsch

While in the process of getting organized, I had cause to browse through other bonsai organizations' publications in order to clear out as many as possible. In so doing, I ran across an article in the July 1995 issue of Lake Charles Bonsai Society (LCBS) monthly Bonsai News. They had done me the honor of reprinting in that issue an article I wrote for the May '95 issue of PBA Clippings entitled "Soil Musings." That article contained some thoughts on soil mixes I'd been trying and concluded with the statement, "I'll let you know if anything comes of it." The time has come to do just that, so here goes.

In essence, one of the new soil mixes mentioned was one which Roy Nagotoshi had developed over a 13-year period. The basic ingredients are mentioned in Roy's letter which is reprinted from the above issue of PBA Clippings. Since then, I've been using Roy's mix on some of my bonsai and they seem to be doing quite well. Before converting the bonsai soil for all my bonsai to Roy's mix (volcanic cinder and organic compost instead of the old mix of Turface, Gran-I-Grits, and organic matter), I became acquainted with Warren Hill's thoughts on soil mixes at a Brookside Bonsai Club (BBC) meeting in the winter before last.

There seems to be a distinct common denominator between Roy's mix and Warren's mix. A Warren Hill mix mentioned in the magazine "Bonsai Clubs International" issue of Jan/Feb '97 is "...50% ground Redwood bark or peat moss, 25% fine sand, 25% pumice or perlite (1/8)". After much research into soil types suitable for bonsai culture, I selected this growing medium because it provides a textural quality very close to a sandy loam without the problems that having clay in the mix would create. It provides moisture retention, aeration, and mineral and nutrient retention." At the BBC meeting, Warren stressed that the soil mix should not contain any matter which retains salts (i.e., no clay such as Turface). Considering that requirement, it seems that both Roy's mix and Warren's mix meet it. Last year I started using a soil mix consisting of perlite, Gran-I-Grits, and either peat moss or pine bark mulch, materials which are easy to obtain in this area and which seem to best mirror those in the above two mixes.

My 1995 article also mentioned trying some Kanuma soil for my azaleas. Kanuma soil is found in Japan as the name may lead you to suspect. So far I've not noticed any dramatic growth of the roots of my azaleas. They say that azaleas can tolerate and even prefer shade which my bonsai benches get plenty of. However, the Kanuma soil and the azalea root balls seem to always be damp; and root growth at most seems sparse. Maybe I should revert to doing with my azaleas what Jim Sullivan (Bowie Bonsai Club) did as a test case with one of his - plant it exclusively in sphagnum moss. Before going any further, it is necessary to distinguish between two kinds of sphagnum moss that are marketed. One kind is usually found in those large, 2.2 cubic feet plastic bales (usually

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Calendar of Events

May

June

Meeting location and club contact number for additional information is as listed unless otherwise noted in calendar listing. A member of any one club is eligible to participate in any PBA or PBA member club event.

- Baltimore Bonsai Club
Cylburn Arboretum, Baltimore, MD.
3rd Sunday, 1 PM
(410) 668-1868
- Bowie Bonsai Club
Bowie Community Center, Bowie, MD
Last Monday, 7 PM
(301) 350-3586
(202) 667-1016
- Brookside Bonsai Society
North Chevy Chase Recreation Center,
Chevy Chase, MD
3rd Thursday, 7:30 PM
(301) 365-7621
- Chesapeake Bonsai Society
Call for meeting time and location
(410) 263-2748
- Greater Philadelphia Bonsai Society
Pennypack Watershed, Willow Grove,
PA
4th Thursday, eve.
(215) 663-1678
- Kiyomizu Bonsai Club
Clearwater Nature Center, Clinton, MD
4th Sunday, 2 PM
(301) 839-2471
- Lancaster Bonsai Society
Manheim Twp. Park, Stauffer Mansion
Lancaster, PA
2nd Thursday, 7 PM
(717) 872-5941
- Mei-Hwa Penjing Society
(Chinese language spoken)
Bowie Community Center, Bowie, MD
2nd Sunday, 1 PM
(301) 390-6687
- Northern Virginia Bonsai Society
Greenspring Horticultural Center,
Annandale, VA
2nd Saturday, 10 AM
(703) 575-5616
- Rappahanock Bonsai Society
Call for meeting time and location
(540) 775-4912
- Richmond Bonsai Society
Imperial Plaza, 1717 Bellevue Ave.,
Richmond, VA
4th Monday, 7 PM
(804) 527-4000 Ext. 4621
- Washington Bonsai Club
U. S. National Arboretum, Washington,
D.C.
3rd Saturday, 2 PM
(202) 543-7433

Organizations sponsoring regular events of interest to PBA members:

U.S. Botanical Gardens
(202) 226-4082

U.S. National Arboretum
(202) 245-2726

Northern Virginia Bonsai Society
Saturday 9
9 am - 12 pm Japanese Black Pine Care and Styling lecture/demonstration by Jim Barrett.
12 pm - 4 pm Barrett Black Pine workshop. Call Chuck Croft for details.

Brookside Bonsai Society
Sunday 10
12 pm - 4 pm BBS Show at McCrillis Gardens in Bethesda.

Kiyomizu Bonsai Club
Sunday 24
2 pm Maple pruning and wiring seminar-bring trees.

Northern Virginia
Saturday 13
9:00 am - 10:00 am Tree Critiques (BYOT). 10:00 - 12:00 Mountain Laurel Styling and Care.

Kiyomizu Bonsai Club
Saturday 27
Trip to Black Pine Nursery (Baltimore)

July
Kiyomizu Bonsai Club
Sunday 26
2 pm Slab making at R. Davis' home (members only)

August
Kiyomizu Bonsai Club
Sunday 23
2 pm Open discussion.

1998 Upcoming Events

May:

NVBS: On the 9th Jim Barrett from California will Lecture/Demo on Japanese Black Pine. There will be a workshop to follow. This will be held at the National Wildlife Federation. Call Chuck Croft 703-978-6841 for more information.

National Arboretum:

May 10: Jim Barrett from California will be giving a Lecture/Demo in Administration Building from 1:00 pm to 4:00.

May 16: Choice Natives for Small Gardens. Horticulturist Martha Eden leads a tour through the Yamaguchi North American Garden.

Editorial, continued

dark brown in color and with varying particulate sizes, even down to a fine powder). It often goes by the names "peat moss" or "sphagnum peat moss" and consists of dead products dug from the earth. The sphagnum moss which should be used in place of a potting soil mix is that harvested from perennial live plants. This sphagnum moss is light brown in color, fibrous, and very dry when purchased. This technique is one practiced by Brian Batchelder

of South Florida and is explained in the article in this issue of Clippings, "Bonsai Potting Mixes or The Real Dirt," by Don Waitkus, a member of the LCBS, Louisiana. I checked with Jeff Stephanic (NVBS), the only other person I know of who has successfully tried Batchelder's method on a bonsai.

The article in the November '97 issue of the LCBS Bonsai News titled "Bark in Soil Mix" gives the following post from the Internet by

MAY MONTHLY CARE TIPS

The following tips have been compiled from 4 Japanese bonsai magazines and Yuji Yoshimura's book. One of the Japanese magazines shows for each tree the monthly chores for five climate zones covering the Japanese islands from the coldest zone in the north (the island of Hokkaido) to the most temperate in the south (the island of Kyushu). The climate zone for which the following tasks were given in the Japanese magazine is the one which includes Tokyo, where the annual temperatures vary much as they do in the region around Washington, D.C.

The below listed tips should be used as a guide and provide a checklist of things to do. Please tailor your chores to match your experience.

CONIFERS

Black pine: Wiring and repotting can be done up to the 10th of May. (Note: Repot every 4 to 5 years.) Apply new fertilizer balls during first 10 days of May. During the last 10 days of May, begin watering as much as three times per day, which procedure is continued up the last ten days of June.

Cryptomeria: Wiring can continue up to the 10th of the month. After 20th of month, begin wiring again (wiring can be done up to Oct. 10th) and one can also repot up to end of June. Trim every sprout from now through September. Begin watering twice per day. Replace fertilizer balls put on in March.

Hemlock: Begin pruning sprouts. Replace last month's fer-

tilizer balls. Water when top of soil dries out.

Hinoki: Regulate the watering throughout the year so that soil does not dry out. Repot every 3 years. (Note: Hinoki cypress can be repotted anytime during the year.) Wire. Replace last month's fertilizer balls. Pinch back new growth.

Larch: Water when top portion of soil appears dry. During last 10 days of May, renew fertilizer balls and pinch back new growth.

Needle juniper: Repot once every 3 years anytime during May; wire anytime through September; begin watering twice a day. Thoroughly wash foliage to deter any spread of mites.

Sawara cypress: Push back new growth; apply new set of fertilizer balls.

Shimpaku (Sargent juniper): Last month to wire; in last 10 days of month start pinching back new growth and remove unwanted old growth. In mid-month start watering twice a day and at the same time wet the foliage.

Spruce: Repot every 3 years; wire; apply fertilizer balls in last ten days of month; water twice per day; pinch back new sprouts so that one third of the new growth remains.

White pine: Replace fertilizer balls during last 10 days of month.

Yew: Repot during first 10 days of the month (repot every 3 years); in mid-month fertilize; during last 10 days of the month reduce new growth so that branch foliage is in shape of arrowhead when viewed from above.

DECIDUOUS:

(Non-fruiting/non flowering)

Beech: Repot before 20th - once every 3 years at this time. Remove wire left on during winter; pluck dead leaves that do not fall off in the fall/winter time frame (dead leaves on a beech should have been left on through the winter). Water twice daily.

Chinese elm: Replace fertilizer balls during first 10 days of month. Pluck sprouts after 5 leaf pairs appeared leaving 2 leaf nodes on branches; prune.

Ginkgo: Replace fertilizer balls during mid-month. Remove unwanted branching during last 10 days of month.

Hornbeam: Prune new growth and remove unwanted branches. Replace fertilizer balls during mid-month.

Japanese maple: Prune unwanted lengths of branches.

Trident maple: Prune unwanted lengths of branches and push back new growth. Replace fertilizer balls in mid-month.

Weeping willow: Replace fertilizer balls during first 10 days of month. Prune during first 10 days of month. Apply insecticide during last ten days of month.

Winged Euonymous: Replace fertilizer balls during last 20 days of month; and during same time frame push back new growth and prune branches.

Flowering/fruiting Plants

Crab apple: Replace fertilizer balls during mid-month. Begin wiring after 10th of month.

May Tips Continued

Gardenia: Apply insecticide during first 10 days of the month. Wire during the middle of the month. Apply fertilizer balls during last 10 days of month.

Holly: During first 10 days of month apply insecticide. Start wiring from start of month. Apply fertilizer balls during mid-month. From 10th of month, start removing unwanted branches and prune back new growth so that 3 leaves remain.

Pyracantha: Blossom during first 10 days of month; remove unwanted branches and chase back new growth after blossoms fade. During mid-month, apply insecticide. Replace fertilizer balls during last 20 days of month.

Quince: Replace fertilizer balls during first 10 days of month. After the 20th of the month, wire and chase back new growth and also begin watering two to three times per day.

Ume: Apply insecticide during first 10 days of the month. Replace fertilizer balls during mid-month. After the 10th of the month wire and chase back new growth. After the 20th, start watering three times per day.

Wisteria: Wire during first 10 days of month. In middle of month, apply fertilizer balls and apply insecticide.

ROY NAGATOSHI'S BONSAI MEDIUM

To bonsai enthusiasts,

It was about 13 years ago when I first experimented with the use of volcanic cinder in my then bonsai soil mix. I broke 1-inch size chunks of volcanic cinder into 1/4 in. to 1/8 in. particles and mixed them with the soil mix. Adding volcanic cinder did lessen the compacting of my former soil mix which was the mixture of sandy-loam soil, organic compost, and sand. For the last 8 years or so, I have been gradually eliminating sandy-loam soil and sand from the mixture. Now, the majority of my quality bonsai are planted in the medium that is composed of just volcanic cinder, organic compost, and nutrient supplements. Paying careful attention to how my bonsai have been growing in this medium for the last 4 years or so, I have been very happy and satisfied with the results. Therefore, I am now confident enough to recommend this product to those bonsai owners who seek optimum provisions for their prized bonsai.

The characteristic of my current bonsai medium: 1. excellent water drainage 2. excellent (not excessive) moisture retention 3. excellent penetration of fertilizers to the root system 4. no compaction 5. better penetration and retention of solar heat at the root system 6. allows new roots to grow directly into all parts of the medium. 7. Less breakdown of mixture components between the repotting duration.

No special step is necessary other than the basic technique for repotting when using this medium. Once the medium is worked well into the root system with chopsticks, firmly press the entire surface to secure the bonsai in place; mixture will not become compacted. This particular potting mix is excellent for pines and juniper bonsai. For deciduous tree bonsai, add an additional 20% to 25% (by volume) more organic compost to the mixture.

In the near future, I plan to refine the mixture and introduce 3 or 4 types of products. I appreciate you trying my product. Please write me with any comments or suggestions. This is the beginning, and I am open to any improvement or refinement.

Sincerely, Roy Nagatoshi 14810 Ararat Street Sylmar, Ca. 91342 (818) 362-5476 (818) 362-3877 fax

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reproduced in their locality, give you "doublespeak," or tell you nothing of material value. For example, in a book prepared by a most auspicious Japanese authority on bonsai, you are told what to look for in the color and character of soils. Information is provided about the strainer grid sizes which should be used. From this you would gather that these masters only use particles ranging from 1/4 inch to inch in size when potting their plants. They thought it was more important to explain how to lay out the material for drying and straining, rather than provide any information about what constitutes a good mix. From extensive analysis of numerous bonsai texts, I am sorry to report that there is no "one great book." Although individually not superior as potting mix reference texts, there are three which can be recommended. These books are *BONSAI FOR AMERICANS* by George Hull, *BONSAI TECHNIQUES* by John Naka, and *THE BONSAI WORKSHOP* by Herb Gustafson. Be aware that the Naka and Hull books are not considered current for potting methodology.

POTTING METHODOLOGY: Homogeneous vs. Striation/Stratification

Recent research has shown that the old method of using striated (layered) potting mix or adding extra gravel to the bottom of the pot for drainage may be doing the plant more harm than good. Many bonsai masters and Florida Horticulture Extension Agents are agreeing that a homogeneous mix from top to bottom, with no change in particle

size and without interfaces between mix media will provide the best drainage.

ORGANIC AND INORGANIC MATERIALS: The Beginning

Most of us think of a mix as combinations of soil, sand, gravel, humus, etc. However, it is more elemental than that. We need to consider the nature of these materials. By doing that, we can get a better understanding of how a bonsai potting mix, or for that matter, any potting mix evolves. It is important to keep in mind, in every potting mix regardless of combinations, all the materials are either inorganic and/or organic in nature.

Inorganic materials such as sand, pumice, solite, gravel, etc., are composed of matter other than plant or animal. These materials have never been alive. They are mineral in nature and, as such, are usually high in mineral content and pH. High pH is interpreted to mean that it is only a relative condition, and by that definition, probably would not exceed 8.0. It is another of those innocuous statements made by a bonsai author that should be taken to its final conclusion, but is typically left to the reader to try to determine what is really meant.

Organic materials such as loam, peat, oak leaf mold, manure, bonemeal, charcoal, compost, humus, etc., are composed of, related to, or derived from living organisms. Fertilizers of plant or animal origin and not chemically manufactured are considered organic.

Older bonsai texts related the need for loam, sand, and humus

which were incorporated in varying proportions usually dependent on the type of plant being potted. The terms organic and inorganic were more often reserved for fertilizer discussion.

CONSIDERATIONS FOR DEVELOPING A BONSAI MIX:

THE BONSAI WORKSHOP describes certain "considerations" which represent a more scientific determination for formulation of a potting mix for a particular plant. While there may be some disagreement concerning their relevance, these "considerations" should be looked upon as tools by which we can provide a better environment for our plants. These "considerations" or anything resembling such an approach, have not been included as a topic in any other text, and for that reason alone, they need to be discussed.

There are five considerations in the makeup of bonsai potting mixes: particle size, texture, soil composition, micro-organisms, and aesthetics. Some folks may have thought about the influences of one or more of these attributes during the preparation of potting mixes. However, our discussion covering these topics in the next part will definitely help you make better decisions about the makeup of the mixes you use to pot your bonsai.

PART 2 -

CONSIDERATION 1: PARTICLE SIZE

Particle size is important, because it has not really been fully understood before. It is now being considered as the most important characteristic of a mix. Because of

Soil, continued

the surface tension properties of liquids, when potting mix particles are so close together (small) that the surface tension of water creates a capillary effect, the water will tend to rise against gravity or cling to the particles. A pot filled with such a mix might not allow roots to grow. The interstitial (area between particles) spaces would be occupied by water and not air. Evaporation might briefly dry out the plant, allowing some oxygen flow, but the plant would soon be struggling for water. The roots would perform poorly, new buds would be small,

discolored and weak. It would be very difficult to get the soil wet once it was dry. The water would tend to roll off the top of the mix, and it would be very difficult for the mix to dry out once it was wet. Some roots would rot every winter, and eventually, the plant would die. Sound familiar? How can this problem be prevented? Human nature, being what it is, has us watering our plants whether they need it or not. I'm sure you'll agree that more plants die from this over-kindness than for any other reason. So, the problem may not be capable of complete resolution. However....

STRAINING THE POTTING MATERIALS HELPS YOUR PLANTS!

You can alleviate some of the problems by straining/sieving your bonsai mix materials. Particles less than 3/32 inch and greater than 1/8 inch should be strained out of each component of the mix, with the exception of the fertilizers and certain soil amendments. I've heard that 3/16 inches should be the maximum size, but apparently that thinking has recently changed.

TO BE CONTINUED

Bonsai—A Bitter Fruit? by Peter Abresch

Peter Abresch, president of PBA in 1976 and a member of Kiyomizu, will be at the PBA Spring Bonsai Festival to sell and autograph his new novel, "Bloody Bonsai."

A 3-foot bald cypress (*taxodium distichum*) styled in a jin ("peeled end pointed like a spear") becomes a murder instrument as Peter Abresch stirs in bonsai, romance, and an Elderhostel adventure into the "Bloody Bonsai" mystery.

When everyone pushed James Dandy into going on an Elderhostel, romance was the last thing on his mind. No. The last thing was to find a busboy with a tree sticking out of his chest. No. The last thing

was to be read his rights for killing the sleazy little man. And it didn't help that his new romance, Dodee Swisher, wanted them to track down the real killer themselves. Then again, maybe it did.

"Bloody Bonsai" is a fun book to read, especially if you know something about bonsai, and fun even if you don't. The story is a nice mix of excellent bonsai information, factual comments concerning Elderhostels and interesting detective work mixing blood, bonsai and romance." - Tom Zane, founding president of Kawa Bonsai Society and Past President of the Bonsai Societies of Florida, Editor of the 4th edition of the ABS publication:

Bonsai Manual for Appreciating, Judging and Buying Bonsai.

"As a bonsai person, I find Peter Abresch's book, "Bloody Bonsai," intriguing. His excellent use of people involved in the study of bonsai, in relationship to a crime, is well done. Once I started the book, I didn't want to put it down. I had to find out who did it, and why." Chase Rosade of Rosade Bonsai Studio, New Hope, PA.

"Bloody Bonsai," ISBN: 1-885173-34-2, by Peter Abresch, Write Way, 10555 E. Darthmouth, Ste. 210, Aurora, Co 80014, 239p, \$21.95

Web-sight for Bloody Bonsai - <http://www.writewaypub.com/bonsai.html>

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PBA ANNUAL AUCTION

It is time for the PBA Annual Auction once again, and with it the opportunity to thin out your stock and turn them into hard cash or add to your collection at possible bargain prices!

Each seller will be given an individual registration sheet with seven numbered lines for a written description of each item to be sold: Where and when acquired; Common and botanical name; Age; Minimum bid, if any. In addition, there will be tags, with corresponding numbers, to be tied on each auction item.

Schedule: 8:00 am

Nursery opens.

9:00 - 10:00 am

Bidder registration.

Delivery of items for auction.

10:00 am

Auction begins.

Noon

End of auction.

The auction will be held rain or shine. The location is in the Dawn Rose Building, second floor. Guide signs will be posted. The Behnke's Nursery is located at 11300 Baltimore Avenue (U.S. 1), 2 miles north of Capitol Beltway Exit 25A, Beltsville, Maryland. Once again, PBA is grateful for the generosity of Behnke's Nurseries in offering, at no charge, their facilities for this auction. ●●●

Anton Nijhuis: "In my own experiments I have witnessed phenomenal root growth with Mt. Hemlocks in straight bark mulch. No magic hormones, no Superthrive and no fertilizers. Just mulch and water. Hormones and Superthrive do not make roots grow. A rooting hormone can only stimulate the plant that this is where a root should grow, but if you do not have the properly aerated growing medium, root growth is limited. Compaction of the soil is the number one killer of plants."

Concerning the above all-sphagnum-moss approach, one wonders about the amount of gas or open space in such a soil mix after it has been thoroughly watered? Root rot is one of the consequences of having a soil mixture without the proper balance between the amounts of solid, liquid, and gas (all by volume) existing in a fully watered soil. Everyone has heard the comment that a bonsai soil must be a well-draining soil, which is probably another way of telling if there is enough gas space. An article, "Root Rot and Its Control," by Zachary Smith which appeared in "BONSAI: Journal of the American Bonsai Society," covers what he has gleaned from reading and discussing the subject with knowledgeable people. The author points out that root rot is an insidious disease that no one can see is occurring until the visible portions of the tree suddenly start dying, and it is irreversible. The author indicates that the best defense against root rot is the following: "Experience has shown that proper bonsai soils should be 50% solid, 25% li-

uid and 25% gas (by volume). When this ratio is maintained, root rot is extremely unlikely."

How does one know if one's soil mix meets the above proportions of solid, liquid, and gas? In a previous issue of PBA Clippings, Harvey Everett showed how to measure the amount of solid, liquid and gas in a soil mix and recommended that one try this for one's own soil mixes. Harvey's method, along with a table of his results for different mixes, is included in this issue of Clippings. Since neither of the mixes mentioned above, Warren Hill's or Roy Nagatoshi's, had been evaluated by Harvey,

The results varied depending on the sizes and proportions of the constituents, which is an indicator that you should do your own Harvey Everett tests on your soil mixes if you want to make certain of the amounts of gas to liquid by volume.

One can spend a lot of time and energy experimenting with soil mixes, as is apparent from all that has been said and done concerning the "ideal" soil mix for a specific plant. If you have mixes which are working for you, stick with them; but it's a lot of fun to try a new approach. It seems that the consensus of opinion is that there must be enough voids for a gas space in the mix, some organic material must be present, and any clay materials which tend to retain salts should be avoided. It's an endless tale.

Still, we have not addressed the subjects of pH and watering. More next month.

Soil Survey by Harvey Everett

By coincidence most of our bonsai media have about 50% solids. The variation is in the distribution of liquids and gases. In th eopinion of this author, bonsai solids should be selected so that the liquids and soil gases each range 15% and 30% depending on specific plant needs.

This proposed approach for choosing soil ingredients from the measurement of solid, liquid, and gas percentages is a more positive way to select a soil medium than conventional approaches especially when the soil material does not have qualitycontrol or we established properties.

1) Tape identical scales from 0.0,0.1, 0.2 ...1.0 on identical glass jars of about one pint capacity.

2) Fill both jars to the 1.0 mark- one with absolutely dry soil to be tested and the other with water.

3) Fill soil jar with water from the jar to the 1.0 mark on the soil jar.

4) Keep adding water to soil jar to maintain water level at 1.0 mark until soil absorbs no more. Measure water level in jar. e.g. A is 0.4.

Carefully top soil jar and pour free water back into jar.

B... is 0.65

5) Use kitchen strainer to catch soil which might fall from jar.

Calculations

Water absorbed = 1.0 - 0.65 = 1.0 - B = 0.35 or 35%

Gas space = B - A = 0.65 - 0.4 = 0.25 or 25%

Solid = 1.0 - (0.35 + 0.25) = 0.4 or 40%

TABLE OF SOIL MEDIA, WATER AND GAS BY VOLUME

	SOIL MEDIA	SIEVE GROUP					PERCENT		
		2-4	4-8	8-16	16-20	Over 20	Solid	Liquid	Gas
Organic Media	Milled Peat Moss	0	35	30	12	23	32	68	0
	Leaf Compost Sifted	-	30	70	-	-	36	29	35
	Wood Chip Compost Sifted	-	35	65	-	-	45	34	21
S C O O I N L I D I T I O N E R	Kitty Litter — As-is	0	31	60	5	4	45	38	17
	Kitty Litter — Sifted	-	34	66	-	-	44	37	19
	Vermiculite — As-is	0	53	18	29	0	35	57	8
	Vermiculite — Sifted	-	75	25	-	-	35	46	19
	Perlite — As-is	0	1	41	58	0	38	46	16
	Perlite — Sifted	-	3	97	-	-	40	35	25
	Terra Green — As-is	0	21	62	13	4	34	39	27
	Terra Green — Sifted	-	26	74	-	-	38	38	24
	Junior Jumbo Terra Green — As-is	10	63	25	2	0	44	28	28
	Jr. Jumbo Terra Green Special Sift	-	100	0	-	-	43	27	30
Inert Media	Builders Sand — As-is	0	12	16	72	0	67	31	2
	Builders Sand — Sifted	-	46	54	-	-	63	26	11
	Creek Sand — As-is	-	50	49	1	-	57	31	12
	Creek Sand Sifted	-	99	0	1	-	54	32	14
	White Sand	0	0	0	53	47	57	42	1
	Chicken Grit Grower Grade 0	0	67	33	0	0	49	6	45
	Crushed Feather Rock 4	4	8	27	8	53	45	55	0
	Feather Rock — Sifted	-	23	77	-	-	42	18	40
	Arundel Expanded Slag — As-is	32	31	16	10	11	50	14	36
	Arundel Expanded Slag — Sifted	-	66	34	-	1	42	18	40
Soil Mixes	1/2 Each: Chicken Grit, Kitty Litter	-	50	50	-	-	47	31	22
	1/3 Each: Chicken Grit, Kitty Litter, and Peat Moss	-	45	43	12	-	55	32	13
	1/3 Each: Chicken Grit, Kitty Litter, and Leaf Compost	-	44	56	-	-	52	31	17
	1/3 Each: Chicken Grit, Terra Green and Wood Chip Compost	-	43	57	-	-	42	34	24
	1/3 Each: Chicken Grit, Jr. Jumbo Terra Green and Leaf Compost	-	41	59	-	-	44	30	26

Editor's Comment: Because the quality control of the items noted above may vary from manufacturer to manufacturer, it is advisable to test your own soil mixes.

Reprinted from the Potomac Bonsai Association's PBA Newsletter

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AN EVENING HONORING YUJI YOSHIMURA**A TRIBUTE TO HIS ARTISTRY**

JUNE 24, 1998 AT 7:00 P. M.

Sponsored by The National Bonsai Foundation
 At the Bonsai Museum at the United States National Arboretum
 In the International Pavilion--an exhibit of bonsai that were
 inspired by Yuji Yoshimura

7 PM Light refreshments served in the courtyard

8 PM in the Yoshimura Center

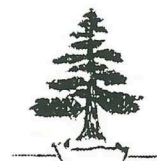
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To become a member, call the contact person of the nearest club for current rates and where to send this application and dues. (Please make check payable to the club joined.)

Individuals residing beyond commuting distance of a club are invited to subscribe to PBA Clippings. For a subscription only (does not include participation in club events), complete application and mail with a check payable to PBA for US \$15.00 (US \$35.00 for an international subscription) to: Judy Wise, 1259 4th St., SW, Washington, DC, 20024. For additional information, please call Judy Wise: (202) 554-3045.

Regular meeting times and places are listed. Meeting times and locations are subject to change. Call first! Events are listed monthly in the Calendar section of PBA Clippings.

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- BALTIMORE BONSAI CLUB**
Cylburn Arboretum, Baltimore, MD
3rd Sunday, 1 PM
Arschel Morell (410) 744 - 6478
- BOWIE BONSAI CLUB**
Bowie Community Center, Bowie, MD
Last Monday, 7 PM
Jerry Adkins, (301) 350-3586
- BROOKSIDE BONSAI SOCIETY**
North Chevy Chase Recreation Center,
Chevy Chase, MD
3rd Thursday, 7:30 PM
Jerry Antel, (301) 320-5251
- CHESAPEAKE BONSAI SOCIETY**
Call for meeting time and location
Tom Snow (410) 923-2783
- GREATER PHILADELPHIA BONSAI SOCIETY**
Pennypack Watershed, Willow Grove, PA
4th Thursday, eve
Larry Chiger, (215) 663-1678
- KIYOMIZU BONSAI CLUB**
Clearwater Nature Center, Clinton, MD
4th Sunday, 2 PM
Essie Wilson, (301) 839-2471
- LANCASTER BONSAI SOCIETY**
Manheim Twp. Park, Stauffer Mansion
Lancaster, PA
2nd Thursday, 7 PM
Cindy Kamide, (717) 738-3957
- MEI-HWA PENJING SOCIETY**
(Chinese language spoken)
Bowie Community Center, Bowie, MD
2nd Sunday, 1 PM
Akey Hung, (301) 390-6687
- NORTHERN VIRGINIA BONSAI SOCIETY**
Greenspring Horticultural Center, Annandale, VA
2nd Saturday, 10 AM
Chuck Croft (703) 978-6841
- RAPPAHANOCK BONSAI SOCIETY**
Call for time and meeting location
Todd Stewart, (540) 775-4912
- RICHMOND BONSAI SOCIETY**
Imperial Plaza, 1717 Bellevue Ave., Richmond, VA
4th Monday, 7 PM
Jim Ford, (804) 272- 3021
- WASHINGTON BONSAI CLUB**
U. S. National Arboretum, Washington, D.C.
3rd Saturday, 2 PM
Julie Walker, (202) 547-8497

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