ABOUT SEEDS & HOSTAS

written by Bill Nash

SPROUTING SEEDS -- Is a simple process: all you need do is research the 'Germination Requirements' for the particular plant-species you wish to grow and then, duplicate these needed conditions. Seed from many species, for example genus Hosta, sprouts nicely indoors under normal house conditions, with temperatures running 60 to 70 degrees Fahrenheit.

ONE RULE -- that you need to pay special attention to: **your Growing Medium must be sterile**! It must not be contaminated with the pathogenic fungus spores or bacteria. This mildew spore is present in all outdoor soil, so you cannot use soil from your garden without sterilization first. You can sterilize soil in the micro wave and this will stink up your kitchen badly, so do it in the garage, or outside. Sowing containers and any other materials used with the seed-sowing, should also be free of fungus. If you use unwashed sowing containers which were lying around outside, then a white mildew (mold) will likely grow on the soil surface, and when seeds sprout, these seedlings can rot away. This is called 'Damp Off'. When wetting your sowing, using a good systemic fungicide solution like Benomyl/benlate ®. This will solve your mildew problem if your growing materials are not too badly contaminated with fungus spores and bacteria.

GROWING MEDIUMS -- are for sale at all Nurseries and it is better to buy a pre-mixed medium, rather than trying to make your own using un-sterile soil from outside. Three basic ingredients go into most growing mediums sold: shredded peat-moss, vermiculite and perlite. Products are also available designed and mixed for specific applications, be it sowing seeds, potting plants, rooting cuttings in and so on. Pro Mix (Trade Name) is one good example and their 'BX' formula suits all purposes, like potting, sowing seeds and rooting cuttings in it. Your can mix your own growing medium, using the three basic ingredients mentioned above, and any ratio from 1-1-1 through to 3-2-1 (peat-moss, vermiculite, perlite respectively) will provide excellent results. Hosta seeds will also sprout well in any of the above. The key to growing healthy plants is to provide for good root development. The growing mediums described here are soil-less, but if you also wish to add a good sterile potting soil to your mixture, this will also provide excellent results.

GERMINATION PERIOD -- The actual time it takes for seeds to send up sprouts, after sowing/wetting, is known as the 'Germination Period' and this period varies with different species. The soil temperature which seed sits in during it's germination period plays an important role as to how long it will take the seed to sprout and whether the seed will sprout at all. If, for example, you have a thermometer in the room where the seed is sown, and it shows the air temperature is 70º Fahrenheit, then you can assume the soil temperature is running several degrees cooler, since soil temperatures tend to be a bit cooler than the air temperature in a room. In such an environment, the germination time for hosta seed to show sprouts coming out of the growing-medium will be fourteen days, give or take a few days. Hosta seed does not require light to assist sprouting, therefore, you can place your sown containers in a warm area of your house (like on top of your refrigerator or TV) or on the highest spot in a room: for example, top shelf of a book case. On the fourteenth day after sowing, move your hosta sowing under fluorescent lights or window sill, whichever you wish to use. If you happen to see sprouts showing and breaking the soil-surface before this time period, then by all means place the sowing under lighting. Something triggered a quicker sprouting period. Sprouting has been reported, with

hosta-seed, as early as seven days after sowing. Of course, the roots come out of the seed first and I would recommend, sprinkling just enough of your growing medium over top of sown seeds, until you cannot see any seeds lying on the surface. There has been, and continues to be, some heavy debate related to surface sowing versus burying the seed. Surface sowing means that the roots will be lying on top of your growing medium when the seed sprouts hence, you will need to shove these roots into the soil, somehow I believe, covering the seed is the best way to sow hosta seed, since roots will take hold as soon as they come out of the seed and no need to stick them into the ground. It is a good idea to use a drip-less bottom tray for your sowing containers to sit in, since this prevents water leakage and also allows for bottom tray watering. By the way, the genus Hosta is one of the genera whose seedlings and/or pot transplants can sit in the water nutrient without having any bad effects like crown rot. The fastest growing method to do hostas, is to have the seedling sitting in water, all of the time. This kind of opens up the topic of using hostas as pond plants, ie.. immersing pots in ponds, but I won't get into this. Your growing containers should have holes in the bottom, needed for proper drainage, aeration and bottom watering. A good trick to do with your seed-sowing (no watering needed after the initial sowing and wetting) would be to place your sowing container inside a plastic bag (sealed air tight) like a Zip Lock clear plastic bag for example. The sowing is now inside a miniature greenhouse. This 'Incubation Growing Chamber' maintains hundred percent humidity around your sowing; you will not need to water again until seedlings require transplanting, which can be several months later, if you wish. This “sealed sowing procedure” is tricky and risky to do, since everything incubated inside the growing environment must be sterile, free of fungus and bacteria, or else mold will grow and 'Damp Off' can result. You cannot grow seedlings, in the incubated state, until plant out time, when you are using a soil-less growing medium alone, deficient in plant-nutrient/fertilizer, since the plants will require to EAT. Please excuse my anthropomorphic-wording here, but yes, plants need to eat food too in order to grow properly! You will need to “open your mini-greenhouse” and mist plants with a water soluble fertilizer-nutrient (a quarter of the recommended strength, say once a week) and reseal the sowing again. Liquid fish fertilizer formulas are the best since nutrient is readily available through leaf pores, with no leaf-burning effects taking place. Most fish-fertilizers stink pretty bad, so look for the bottle which says 'perfumed'. Bone Meal is another super-fertilizer, totally organic, which I would advise everyone to mix-in with your seed-sowing growing medium and a bit mixed in with seed sowing or directly over top of seed sown. We'll talk a bit more about this at the end of this.

ABOUT SOWING CONTAINERS -- There are standard plastic greenhouse flats measuring 11-inches wide, 22-inches in length, about 3-inches deep and these are available with or without holes in the bottom. Also available are plastic sowing-tray inserts having 10 to 20 pre-formed rows to sow into and these fit into the standard greenhouse flat mentioned above very nicely. Cell packs are also available to put inside these trays, and many use these for their sowing into. A clear plastic dome is also available, which fits directly over these. They come in three inch high and six inch tall domes. See your local Greenhouse Supplier for the above products. This method of sowing provides excellent result. If you use the drip-less flat, with the sowing insert/cell packs and the clear plastic cover over top you can also tape the edges "air-tight" after sowing and wetting (using 2-inch wide clear boxing tape. This 'Total Incubation' of your sowing will not require re-watering for a long time. By the way, it has been reported that using boiled-water in your wetting and growing of seeds prevents Fungus Gnat infestation and also prevents algae growth on the soil-surface. If you intend an incubated sowing to remain so, for a long time,

without unsealing it and possibly doing a direct transplant directly outdoors, make sure you mix Bone Meal with your growing medium! You will see why later.

GROWING PLANTS UNDER FLUORESCENT LIGHTING -- There are two ways to grow hosta, or any other seed

1. ..Professional Style that is to say to produce plants as quickly as possible, doing anything and everything to maximize growth excellence, and sparing no expense to have this done.

   The Professional Hosta Seedling Growers would use 'Continuous Fluorescent Lighting' (no darkness periods) right from the sprouted stage of growth. The lights would run non stop, never turned off until seedlings are moved to an outdoor environment (greenhouse included). Any hosta seedling, sown before the first week of January can flower eight months later, hence this provides opportunity for hosta-hybridizers to get their next seed-generation in a given year, so you can see why this type of seedling-grower spares no expense! They may use expensive high intensity fixtures and/or other added lighting types to try to provide full spectrum lighting in conjunction with greenhouses, since their objectives are not comparable to an amateur grower.
2. ..The amateur seedling grower, simply wants to start some seedlings indoors, as cheaply as possible, to have something to transplant outside when summer weather arrives. The Amateurs can run fluorescent lighting on a timer, having a 'Photo Period' (light: on-off time) on a 12-12 ratio of light-dark, by hours in a day. This will sustain adequate growth for starter plants to go outside later.

A TIP on creating an ideal growing chamber -- Hydroponic Shops sell mirror-like foil; in a four foot wide roll, and sold in foot-lengths. Lining the sides around your growing area; will maximize light-reflection within the growing chamber and contain all light exactly where you want it. Using such "mirror-like reflectors" will permit you to have light bulbs two to three feet above the shelf, which will triple your growing area space. Also, if twelve hours of light seems too costly, you can drop down to eight hours per day, since all light is contained within the growing area via mirror-like foil; and we just want to start some plants for the great outdoors, later on. The cost factor of running, one four-foot, two-bulb fluorescent-light-fixture, on a non stop continuous-light exposure basis (no dark/OFF period?) is: 1.820 of the price you pay for electricity, per kilowatt hour of electricity usage charge. Considering, that this single light fixture, can provide you with a growing area two feet by four feet (eight square feet) of growing space. And you can place FOUR standard greenhouse flats (crosswise?) in this space.. And each standard greenhouse tray can contain 1000 to 1500 seeds (6000 seeds under one fixture?) - - THEN the only cheaper-method? -- to consider is:

SOWING SEEDS DIRECTLY OUTDOORS -- and different kinds of perennial-seeds, sown directly outdoors, when soil temperature is below 42º Fahrenheit -- Sown in Aurtumn? -- will sprout as we move into summer and as soon as soil temperature moves above 42º Fahrenheit. This 42º factor is a magic one, hosta seed and plants want to grow above this, while they move into dormancy and do not grow below it. Hosta seedlings sown and sprouted outdoors will grow large enough to survive the next coming winter. Other perennial seed types which require stratification particularly (moist freezing) before they will sprout are particularly good to sow directly outside, say in November, just before the ground freezes, or early Spring, when night frosts can still do the stratification for you. For example Dicentra (Bleeding Hearts), which require stratification to sprout the seed, do well sprouting when this seed is sown the autumn before or early spring time. These are also nice companion ornamentals for hostas being shade

tolerant and very early Springtime flowering. Bleeding Hearts, are also great to grow to provide shade for hosta-seed you've sown under and beside them. Putting a two to three inch layer of peat moss over your existing garden soil (with bone meal added to it) will act as a bit of a mulch against weed-seed sprouting and also provide an excellent germination base for whatever seed you wish to sow directly outside. An easy method of doing this is to simply run your hoe across the garden bed, making a trench about three/four inches deep. Fill the trench with peat moss, add bone meal, sow your seed and cover seeds with more peat moss. The biggest problem with this kind of outdoor sowing is weed seeds also sprout and if you think that weeding can be a pain, then just forget it. The weeds will grow ten times faster than first year hosta seedlings sprouting and this provides the needed shading for your hosta kids in their first year of growth, so just forget about weeding for now.

An easy method of growing hosta seedlings 'In the Shadow of the Weed'. This kind of direct outdoor sowing opens the doorway to grow hosta seedlings under or beside your already established ornamentals growing in your garden. It allows for multiple-cropping i.e.. sowing annuals to provide shading for the first year hosta-seedlings and the annual type crop will be gone in the second year. And this double cropping or letting the weeds grow allows for hosta sowing beds directly in full sun positioning. Most important, an outdoor sowing procedure provides for the sprouting of millions of hosta-seeds of a given hosta type, to find and obtain that unknown 'Gene-Pool Hosta Type'. A very famous hosta grower told me one time that all hosta types are contained within the hosta gene pool and this can only be arrived at and seen by growing large quantities of seedlings from a given type. We were discussing the feasibility and methods of growing millions of seedlings of given hosta types and the potential of obtaining streak breeders from same, doing the sowing and growing directly outdoors. I've done this procedure with H. sieboldiana Elegans, -- (50,000 plants were sprouted) -- nine striated and mottled plants resulted!

SELECTING UNIQUE HOSTA SEEDLINGS -- There is not much to look for and/or select, from study of a monochrome (one solid leaf-colored) first year hosta-seedling so there is no point trying to isolate the plants you wish to keep, until seedlings are into their second year of growth or better yet, do your final selection when the seedlings are fully mature, years later. In the first year of a seedling's life, keeping as many as possible alive and well is the only consideration worth noting. However, with seed coming from streaky-leaf multi-colored pod-parents (streak kids resulting) it is a different story and we shall go into this later.

HOSTA SEED SOWING AND STORAGE -- Plastic film cartridge containers (Available free from any photo-finishing lab) are ideal for seed-storage. They hold 1000 to 1500 hosta-seeds, depending on size. Sowing a full film-canister in each standard-sized sowing-tray is about the right amount (using sowing containers, mentioned above). An average germination (33%) will provide three to four hundred plants per tray. And when you sow your hosta seed: please keep in mind, that germination from variety to variety 'Is-Very-Irregular' and there are not many types, which come anywhere near 80% germination. You will not get a plant from every seed you sow therefore, sprinkle the seed very thickly (seeds touching; over top of each other) since you will more than likely, be getting one plant for every five seeds you put down, if that? If they come up too thick, you can transplant to thin them out. Folding a thin piece of cardboard, pouring seed into the fold, and then tapping it with your forefinger, is an easy method of sowing. If you mix some bone-meal with the seed, your germination may be a two-fold result in sprouted plants. I'll tell you why later.

STORING HOSTA-SEED PROPERLY -- Film cartridge containers, are ideal for seed storage, since they seal items kept inside AIR-TIGHT. Pollen can also be stored frozen in film cannisters for later pollination use. It has been reported that hosta seeds sprout plants twenty years later when stored frozen AND STORED INSIDE AIR-TIGHT CONTAINERS to prevent freezer burn. Leaving hosta seed out in the open in a normal house condition, results in germination diminishing, even after a few weeks. Storing hosta-seed in the crisper-section of a fridge, running at 45º Fahrenheit, is not nearly good enough either, since this seed will be dead-dry after one year. The magic temperature for storage, was below 42º degrees Fahrenheit...REMEMBER

COLLECT YOUR OWN HOSTA-SEEDS -- There are not many seed-catalogues which offer hosta-seed to purchase and those which do, have not gone to the trouble of storing their hosta seed frozen to preserve germination factors therefore, in most cases, this seed is totally dried-out and will not sprout plants for you. The option open to hosta growers is to collect your own seed. If you do not cut off spent flower stems, you will notice (in most cases) that seed pods are sitting there. The seed pod stems are green, and most seed-pods likewise with hosta type exceptions. The seed is ripe when the seed-pod color has changed from green to yellow, to brown, and bottom pods begin to split open. The minimum ripening time is still being debated, but the previous line is a good measuring stick to use to collect ripe hosta seeds. I would say that the earliest time hosta seed can be ripened to provide for viable germination of it's seed, via artificial means done indoors is eight to ten weeks, my having done this. Collecting your own seed gets even more interesting, since it does not take long, before such a hosta enthusiast collecting her/his own seed, will want to make a self and/or cross-pollination on flowers. AND as soon as this is done, the Seedling-Grower becomes a Breeder-hybridizer -- and making new hosta hybrids is the most challenging, most exciting and most rewarding gardening pursuit of all.

MAKING NEW HOSTA HYBRIDS and 'The Art of Hybridizing Hostas' -- is not so complicated and really is quite a simple matter once a few basic 'Genetic Laws' are known and understood. The easiest way to illustrate the required discipline needed to produce whatever hosta-types of offspring results you may wish from seed, is to look at 'The Benedict Cross' (+). Visualize this cross as having a circle around it like a wheel, a compass, or clock. Simply stated, the 'Benedict (+) Cross' places all hosta leaf forms by coloring onto this conceptualized drawing.

- --> Very center of the cross = ALL Striated leaf types
- --> Very top of cross; 12'oclock position, North = all-green solid color types (blue-green included)
- --> Very left of cross; 9'oclock; West = all center leaf variegated hosta types.
- --> Very right of cross; East = all types having marginated leaf-edging.

You can have whichever kind of the hosta-types you see above from seed growing, so how do we do this. Let's look at...

THE FIRST GENETIC LAW OF INHERITANCE, which everyone should keep in mind and remember: ONLY Streaky Leaf Pod-Parent MOTHER-PLANTS, will provide for multi-colored streaky-variegated seedlings. The other types, illustrated in the 'Benedict Cross' above, are STABLE leaf-color hosta-forms; and these produce single leaf colored kids (seedlings) as a general rule and these are always solid one leaf color seedlings (monochrome colored).

METHODS OF POLLINATION - The easiest method of hosta-pollination, is to let the BEES do it for you and this is not exactly a laughable matter, since some very well known Breeders in our world today resort to this method. They block-plant (in massive groups) those varieties they want bee-pollinated in close proximity of each other, and if these bloom at the same time the

bees do a fairly good job of selfing and crossing pollen from one flower to another. The bees always go into flowers, starting from bottom florets and flying higher up the flowering spike hence bee pollination is mostly a self-pollination. Self-pollination also induces hybrid-vigor therefore it makes a lot of sense why the self-pollination is designed this way by Nature. To have 100% accurate cross-pollination, the only way this can be done is to remove the floret-petals and pollen-sacs (stamens) just before florets open. This removes the landing-pad which bees use to enter the floret. In most cases the flower which has its petals cut away before the flower opens is not quite ready to receive pollen, but this can be done the following day, since the chance of bee-pollination has been removed. Going outside, early morning, say at sunrise, and doing pollination on newly opened florets using artist's brushes, is also a good method of doing crosses. Trying to pollinate in mid-day to late-afternoon is near impossible, since the bees have already done the pollination for you. There are all kind of tricks in hand-crossing and each hybridizer generally uses his own method of doing it. Some breeders use tweezers to apply the actual pollen-sac from one flower to another. Others use artists brushes. Any pollination method is suitable, as long as the job you want done..gets done!

Collecting, Drying & Cleaning Hosta Seed

This process is not difficult. When you see pods on the flower scapes, the first question that comes to mind is, “When will these pods be ripe enough to harvest the seed?” Generally speaking, it takes at least three months and sometimes a little longer depending on variety/environment. The best way to know when to collect the seed is to watch the bottom pods on the flower scape. When the pods start changing colour towards brown, they are becoming ripe. When the pod has become brownish black in colour and the pod starts to split open, the seed is ripe and should be collected. If left the pods will split open and the seed will fall on the ground and be lost. A hint for an easy way to collect ripe seed is to take a pair of panty hose, cut the legs off, then roll the stocking over the pod scape and tie it at the bottom. When the seed pods split open, the seed will be collected inside the hose. Another common collecting method is to watch the seed and when you see the bottom pods are beginning to split open, you can snip off at least the bottom half of all pods on the scape. Some people prefer to cut off the whole spike, drop this inside brown paper bag and place this in a cool dry room (like garage) to dry out completely. A faster method to have seed dried, cleaned and in storage within 5 days, is first to cut the seed-pods off the scape with scissors and then take them right inside the house. Using regular sheets of paper with edges folded up box-like, put the collected pods inside and because it’s warm and dry inside the house the pods will split open within two/three days. Dump these into a box and shake to empty seeds out of pods. Empty seeds into a spaghetti strainer, that has quarter inch holes, this results in the seed falling through and pods remaining behind. When the seed has been removed from the chaff, it can be dumped again into a flour strainer, shaken lightly and in this case dirt and dust is removed from the seed. The fungus spores which leads to mold and damp off is likely contained within the dust/dirt mixed in with the seed, therefore straining this away seems like a good practice to follow. At this point the seed should be fairly clean and dry. Remember, only dark brown to black seed is viable. Discard any other colour of seed. At this point the seed is ready for sowing. If you don’t plan to sow immediately, put the seed in a plastic film canister as mentioned earlier, label, seal it and store it.

It is exciting to sow seed and watch new life sprout forth. Hostas, being the true perennials they are, makes this pleasure a lasting experience as they develope new characteristics each succeeding year until the hybrid reaches maturity (4 years). Calling this a ‘Thrill of a Lifetime' may be too far-fetched but it’s surely somewhere near the top of my list of 'HAVING FUN'.

MAKING LABELS WHICH LAST FOREVER -- It is important, to have good labels, on your hosta seedlings, since some very slow growing hosta seedlings (say for example very highly-variegated types with little chlorophyl in leaf-cells) can take six to seven years of growing, before you will see their mature form. Using plastic labels sold at most Nurseries and writing on these, using a waterproof marker, is not nearly good enough! Outdoor elements make such a label unreadable, within one year. The sun's rays make the plastic brittle and consequently, they break. Use of metal labels, with writing put on same via Electric Engraver, is the only way I do this. Aluminum house siding is being scrapped to make way for the new vinyl siding on homes. Good metal cutting sheers, can make any shape or size of label you need? And cutting the pedigree data right into this metal, is like almost evermore? Or as long as you shall need to pull and read that label, a great many years later. Even aluminum pop cans, very thin aluminum; and easy to cut up into labels: is better to use than plastic. You can scratch your identification parent-info, with a carbide tipped 'Scriber'. Using aluminum labels, means, they will not rust; and this kind of label-making, will make plants identifiable per pedigree information, as long as needed.

AN ULTIMATE CHALLENGE FOR HOSTA HYBRIDIZERS/seedling growers -- How to get, multi-colored and variegated hosta-leaves from seed. Hosta Hybridizers & Hosta Seedling Growers must use seeds collected from those pod-parent Mothers having streaky-striated leaves to get variegated multi-colored seedling-progeny resulting. This hosta-form, or leaf-type, is an 'UNSTABLE HOSTA FORM' by it's very leaf-color nature. As such, only these striated-leaf hosta-types (the unstable form) shall provide for streaky-leaf offspring results (and similar to Maternal Aspect (pod-parent) by leaf-coloring). A "striated-leaf" on a hosta (by definition), can be yellow in color, or green-colored (blue-green included) with splashes and streaks of yellow and/or white, in the leaf and with no particular pattern in the striation of colors. These kinds of hostas, striated by leaf coloring, produce similar streaky leafed-kids from seed, but only when they are used as the pod-parent (not as the pollen parent!) traditionally speaking and with no consideration given to luck and chance.

ON SEEDLING RESULTS -- coming from STABLE-hosta leaf-forms/colors. These only produce monochrome seedlings (one single solid colored leaf-form) in their kids. The "stable" hosta-leaf-form/colors are as follows:

1. .. A single leaf-color of yellow or green (blue-green included?) and referred to as being monochrome. Stable form.
2. .. Leaf-edging marginated in white or yellow; surrounding a yellow or green leaf (blue-green included) a stable form.
3. .. Center-leaf-variegation of white or yellow and known as 'MEDIO VARIEGATED' hostas.

The stable MEDIOS, are the most interesting hostas, by my opinion, since the multi-colored leaf-aspect, can go beyond the two color spectrum range, and usually is exactly that. One can have a center-leaf-coloring of yellow and white shades, and this, can be surrounded by several different shades of green (blue green inclusive). This kind of multi-color combination within a single hosta-leaf can be seen in a hosta-cultivar example known as H. Choko Nishiki (and/or H. 'On Stage', being the exact same plant!). Likewise: June/Great Expectations and most other medio-typed hostas also show this same-kind of multi-coloring in leaf effect. Please do not confuse the above with those white center leaf colored hostas such as for example 'Night Before Christmas', these are a different sort of center leaf variegation altogether.

STREAK ASPECT WILL SORT-ITSELF-OUT, sooner or later -- THE striated-leaf hosta-types (seedlings, or even bought streaky cultivars) do become and/or will eventually show stable hosta leaf-forms within their single clump in time and likely at their matured stage of growth. As the single stemmed eye-plant clumps-up into a matured specimen (say for example, becoming a large multi-pointed plant, on a single root-crown) then these seedlings, OR cultivars, will show different kinds of shoots within this single root-crown. STREAK (please keep in mind) is not a stable hosta leaf-aspect, and in time it *SORTS-ITSELF-OUT*. It's splashy-leaf-aspect begins to show any of the HOSTA STABLE FORMS, or even all of them, as new leaves appear. This can even happen in an early stage of striated seedling's life-time. Like at the fourth leaf stage of a streaky kid's growing, it can all of a sudden begin putting up leaves from it's very center of the stem, and these can be solid green; that is to say the streaked seedling has become green stable, so trash it! The striated leaf form which one started with is usually still present within the single crowned hosta-clump at maturity however, if and when most of the clump has stabilized into a monochrome-green color, then this can choke out the streak completely due to the faster growing nature of green cells via photosynthesis verses the slow growth nature of highly variegated hostas. At the mature and multi-stemmed clumped-up stage of growth, one usually has different kinds of eye-shoots, by their leaf-coloring and all of these, are contained within a single, mature hosta root-crown. By the propagation process known as root/rhizome-division, one can isolate any particular hosta-leaf type one likes, and propagate those stable types one chooses. It might be a good idea to become aware of eye and leaf-bud division also; and a preamble explanation to this kind of hosta-propagation, can be seen at the Hosta Internet Library, located at: www.hostalibrary.org

HOW DOES ONE GET THE BEST VARIEGATED SEEDLINGS OUT OF A SOWN STREAK-PRODUCING SEED-BATCH -- this is the ultimate challenge to all hosta seedling growers and hybridizers interested in producing new variegated hostas from seed. Objectively speaking what is it that a seedling-grower or hybridizer is looking to find via growing streaky-leaf seedlings and how will she/he go about finding this?

Firstly, IMHO (in my humble opinion) everyone's ultimate objective in growing multi-colored, streak-variegated-leafed hosta seedlings, goes something like this (as I see it): We all want to get as far away as possible from the monochrome-green-leaf aspect and we do desire to move as close as possible to pure-white and the multi-colored-leaves (As much is humanly possible to grow). PURE white leaves do not survive to grow beyond the first leaf-sprout-stage, due to lack of green cells to perform needed photosynthesis, so then how are we to accomplish this task you might ask? Fact of the matter is, the ultimate objective has already been achieved by Tony Avent of Plant Delights Nursery (www.plantdel.com) via Mr. Avent's introduction of 'Out House Delight' hosta and it's subsequent seedling siblings, like 'White Wall Tires'. These hostas unfurl pure-white looking leaves in the spring, they flourish and grow, coming back year after year, cycles of growth continue and these white-leafed-hostas become mature specimens in time.

THE ULTIMATE GOAL CAN BE MET BY PROPER CULLING OF YOUR STREAKY-LEAF SEEDLING KIDS Whenever a given seedling-batch is sown using streak producing seeds (i.e. THAT seed coming from a pod-parent Hosta mother having stripes of white running up it's green flower stem and also having striated leaves and very likely multi-colored streaky seed-pods likewise) then the resulting seedlings will show striated leaves popping up at the very first leaf of the sprout-stage. Of course we must remember, that the seed which is sprouting monochrome-green kids, is also sprouting plants from seed (and green color is a dominant gene

pool factor). Solid-colored green kids grow a lot quicker than those highly variegated forms and even the pure white looking-leaves which we are after. For these to grow into full maturity the green kids must be removed and trashed. At the first and second leaf stage, we remove all of the monochrome green sprouts, since we are after the 'Crême de la Crême' of this seedling-crop (the best multi-colored-leaf variegates). This can be done with tweezers (pulling them out), or scissor snipping them off at the soil level. Care must be taken in doing this green-leaf culling to not disturb any of those highly variegated types, which may be just beginning to send up their first leaf-sprout. If this culling is not done, odds are, that the faster growing monochrome green plants, will choke out the highly recessive and much slower growing white/yellow-in-leaf types. The removal of the green seedlings provides room for the multi-colored sprouts to grow and flourish! The greenery taken out can be transplanted or trashed, as you wish and I recommend the latter.

PURE-white-leaf appearing-sprouts, normally will melt away and die as soon as the seed-core embryo stops feeding that first leaf and if they do not have enough green-cells within same to photosynthesize their chlorophyll growth function. If however, the seedling batch is growing inside a rather ideal growing environment, as per humidity, temperature and lighting, then it will be seen that even some of those white-looking leaves do survive! They move into their second and third leaf stages and grow. I would like to suggest, that these will be your most attractive hosta specimens if you can grow them into maturity. From this explanation it should be seen why it is very important to remove the monochrome-green sprouts VERY CAREFULLY and tend with tender loving care for those highly variegated kids which we are after in this seedling growing in the first place. They may not have even sprouted yet, being much slower in sprouting and growing, than the greenery already there. Our first objective was to find and isolate the most highly variegated hosta seedlings and the above explains exactly how this is done.
STABLE HOSTA-FORM ISOLATION and propagation of same at the mature stage of a streaky seedling's growth stage. Conceptualize and picture a matured hosta clump, having say 20 separate 'shoots' on a single root-crown. Some of these shoots/points can have all green leaves, others show white or yellow margins on leaves, some are center leaf variegated and even an all yellow leaf type may be seen there. "Ah-ha?" You see the striated-leaf-form which you started with, is also in that clump! You can isolate and propagate any type you see and like, within this clump. So how do you do this?

In mid-August or early September, cut all of the leaves off of the plant, leaving about a two-inch leaf-stem sticking up. Dig the plant out of the ground. Wash all the dirt from the roots. Take the plant to your favorite MEAT SHOP and have them put this huge meaty-root-crown through their meat-slicer. You want root-crown-pieces coming out of slicer at about half-inch sized square-pieces of crown-meat. Take these pieces of plant-meat (crown pieces) back to your preferred growing bed and plant them! The next year, you shall see each meat-piece (of the root-crown) producing points for you. [IMPORTANT SUBNOTE] -- I hope that you, reading my meat-slicer procedure above, DID NOT take me serious about having a 'Meat Shop Slicing Machine' do the hosta crown division for you using a meat-slicer. However, that is almost exactly what we do when we put the knife to a hosta root-crown to isolate specific hosta forms and propagate further. Every hosta-form we saw explained via the Benedict Cross (+) can be present in a single matured hosta clump and which starts out as a striated leaf form.

ABOUT CROWN PIECES PRODUCING PLANTS -- Each piece of the crown, even without roots attached, does in fact develop roots and grows. Any cut parts of the crown will form a bud becoming a point and it's on the way to the next successive growing cycle. It might be a good idea to obtain some rooting hormone powder, preferably having fungicide within it, and/or a good systemic fungicide like Benomyl/benlate (®) to brush onto all cut-portions of the crown, or else soaking your cuttings in a systemic fungicide solution is good too!..and probably better. Dipping one's clean cutting knife into fungicide powder or rooting hormone with fungicide contained in it and dipping before each cut is also a good practice, since this disinfects the wound and keeps it from rotting later.

MAXIMIZING PROPAGATION at a hosta's dormant stage... If you go outside right now, and if, the ground is not frozen yet (this being mid-December) then you can propagate your favorite-hosta to it's maximum potential RIGHT NOW! If the ground is frozen, grab that fellow in front of your house who is putting a jack-hammer to the pavement to get through it, and get him to dig some of your prized hosta-roots out of the ground for you. Drop these into your bath tub and have a cool shower while you're in there making love to your favorite hosta. Pull off frozen leaves and wash all the dirt off of the plants. You will see that there are a great many buds sitting up on the crown/roots. These bullet-like protrusions are white in colour, since they were under the ground outside. Each of these buds will send up a point in it's next growth cycle, therefore your bud division can go right down to a single bud/point if you can handle going all the way to get as many plants as you possibly can. Otherwise, divide the clump in pieces containing three to six buds/points per divided piece, with some roots attached naturally. The easy starting point is to cut the the clump in half, half the half, half the quarter, half the eighth, and so on, just like cutting a pie or cake.

STORAGE OF DORMANT HOSTAS -- If you happen to have a spare fridge which can be set to run at say 37 degrees Fahrenheit (plus or minus four degrees) then your cuttings (or the whole plant, after giving it a needed bath) can be placed inside a plastic bag, packed inside your sterile & moist growing medium, and put in the fridge for a dormancy period of six to eight weeks minimum and until you want to restart it, or all winter long if you like. Then they can be potted-up and grown under lights, sunny windows, or greenhouse for restarting earlier whenever you like. Or you can take a trip down to Florida and plant them there. Or they can be potted at the time the rhizome surgery was done and kept moist inside their cold storage treatment, that is to say, if you have somewhere which provides the needed space to keep potted, dormant hosta divisions in cold storage. If you don't have a spare fridge in your garage, go out and get one, a good working used fridge can be had for less than some good hosta-types are selling for.

When one does the above propagation procedure and say for example, the hosta one is working with is just a single shoot (one stem) say a newly acquired or a young hosta-plant, and say for example there are two, white buds on each side of this single shoot crown, by lying the roots on a table, parting the root hairs and splitting the crown in half, one has in fact two plants which will sprout in the next growth cycle. Plus the cut part of the crown, will form new buds (self preservation, remember) and this will be up and growing more plants in subsequent growth cycles. There is even more humor to this kind of propagation and further to what I've written, like when one aims the surgery on isolation of each bullet-like-looking bud, it will be seen later on in the re-growing cycle that more than one point pops up to grow, because you missed some hidden small buds. Multi-bud plants do result and these can be divided again, in the next immediate growth cycle, to get more plants. The point here was to show how easy it is to

propagate hostas, right now, in the springtime and/or in late summer, or for that matter, whenever you may like to do it if you have a cold storage place to store the crowns in during their dormancy period. Considering what you've learned above, who needs Tissue Culture Labs to propagate hostas for us?

BONE MEAL IS GOING TO BE YOUR GREATEST INVESTMENT EVER and here is why: *A Bill Nash special seed-sowing tip, and then some!* -- to provide for the best possible germination and growth of newly started seedlings (used with all seeds sown and all growing mediums used anywhere, indoors or outdoors) sprinkle a bit of BONE MEAL powder over top of the seeds, just before covering seeds with growing medium and wetting. Better yet, mix some bone meal in with your growing medium also. Don't forget to do this outside too, if you get into direct outdoor sowing. This information, comes from experimental trials of applying ground-up Bone Meal Powder verses Super Phosphate powder application and verses no seed treatment at all in the sowing of hosta-seeds. These trials were sown in similar fashion, same time, same growing medium (soil-less) and using identical hosta-seed type and identical growing conditions. THIS HAS PROVEN that when simply sprinkling a bit of Bone Meal powder over top of sown seeds, this provides for the best germination results possible and also having the healthiest looking seedlings. The resulting hosta seedling germination quantity was two-fold that of untreated seed. That is to say, seed which had no nutrient fertilizer added to it.

BONE MEAL is a pure organic fertilizer, having a nutrient fertilizer-element composition of 2-11-0 (Nitrogen=2%, Phosphorus (phosphate)=11%, Potassium= zero percent). Super Phosphate (0-20-0) has a fertilizer-element content of 20 percent phosphorus/phosphate, nothing else. The application of Bone Meal showed much better results than Super Phosphate treatment with seed-sowing trial. The two percent Nitrogen contained in Bone Meal acts like a needed helper to work with the phosphate hand-in-hand so to speak (catalyst-like) and hence provided the best overall results, which showed me that this extra trouble of sprinkling a bit of bone meal over top of sown seeds, is well worth this extra work/effort! In this experiment, the Super Phosphate application provided a better result than non treated seeds, but was not as good as the bone meal application hence, the nitrogen content within bone meal was the needed catalyst which provided the best germination and growth effects overall.

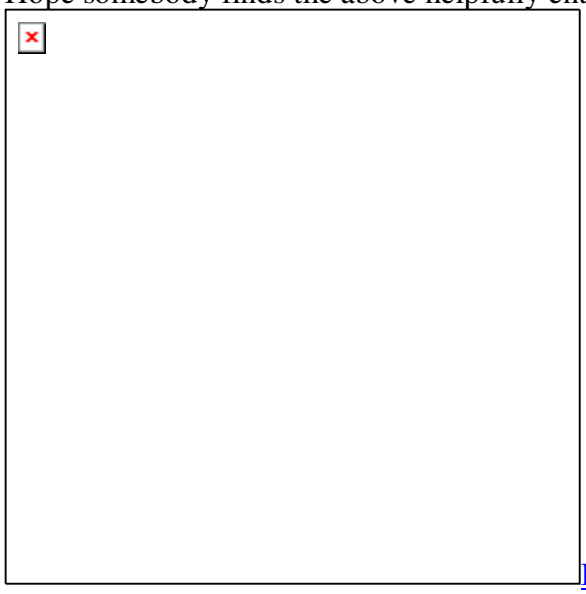
HOW AND WHY BONE MEAL PROVIDES THE BEST SEEDLING GERMINATION AND GROWTH ...and quoting from a book titled 'BEDDING PLANTS' (published by the American Grower's Association) 1976.

> [QUOTE] -- Phosphorus (P): This fertilizer-element is related closely to vital growth processes of plants. Like N (nitrogen), it is part of the amino acids and proteins that form the structural framework of the protoplast. It is a catalyst in the energy transfer and is involved in the conversion of starch to sugar. Phosphates act as buffers to maintain satisfactory conditions of acidity and alkalinity in plant cells. P (phosphorus) is of special importance in the germination of seeds, in the metabolism of seedlings, and in the development of roots. Phosphorus is absorbed by plant roots as phosphate. This Phosphate is not used by the plant in large quantities, but it is essential to have a constant supply. The functions of P (phosphate) and N (nitrogen) in the plant are related closely. Phosphates are absorbed more rapidly by plants when N (nitrogen) is present in the soil mix. END QUOTE

[SUBNOTE] and this is how and why the Bone Meal application experiment on seed-sowing (having 11 percent Phosphorus AND WITH 2 percent Nitrogen fertilizer nutrient-element contained in the Bone Meal) and by direct comparison to Phosphate, which has 20 percent

Phosphorus/phosphate, but no Nitrogen element contained at all to provide for the needed catylist, therefore the sprinkling of Bone Meal with seed-sowing does provide for the best germination and plant growth possible! The bone-meal seed treated germination showed a two-fold increase of sprouted plants by direct comparison to seed-sown which had no additive nutrient-element provided at all!

Hope somebody finds the above helpfully entertaining



Bill Nash