President's message

Here we are, starting a brand new year full of opportunity and challenge. With the shorter days and longer nights we have time to study the seed exchange list and plan for the year ahead. We dream thru beautiful illustrations in the seed and nursery catalogs and have hopes this year we will succeed in growing flowers and vegetables as beautiful as pictures in catalogs.

As gardeners we are not too discouraged by past failures. We believe that with a little added knowledge and a little extra care this year we will succeed in growing that difficult, almost impossible species. Along this line of thinking, as Primula growers, I would like to suggest two goals to achieve this year. First, grow at least one Primula species that you have not grown before. Second, make at least one hand pollinated cross between two Primula plants that you think would produce interesting results. Pollinate enough flowers, so with luck, you will have extra for the seed exchange. Even a few hand pollinated seed for the Exchange is appreciated. It is this type of activity that adds interest and challenge to Primula growing.

The APS slide library is in need of Primula species pictures. We have thousands of good pictures of primula plants and displays at our shows but very few of species growing in the wild. The ideal for each species would be one picture of the general area where it grows, one showing the site (in a scree, on a cliff, edge of a stream, a shady moss covered bank or rock, in a crevice with a seep). One picture of the full plant close up, and one showing detail of the flower. It is a big order but, is what we need for each Primula species. Maybe, we can grow more Primula species in our gardens with this pictorial information.

I am hoping more APS members will have the opportunity in their travels this year to see Primula species in the wild and record the information in pictures with an extra set for the APS slide library.

Herb Dickson

P.S. My new knee is working fine. Looking forward to getting the other knee done soon. The pikers, they wouldn't put in a bionic knee; they just put in a plastic and steel joint.
An added note to Irene Buckles' excellent article on collecting seed. When mailing seed in regular envelopes, it is a good idea to take the envelope to the post office and ask to have it hand stamped. This will save it on this? Allan G. Stavos, 102 Arleigh Street, Wayzata, MN 55391.

I have grown Primula clusiana (6 plants) in various locations for 3 years; they will not bloom! Can anyone help be able to give you a success story.

I am also trying to raise a strain of six-petalled G.L.P. (shades of Formosa) and am crossing only six-petalled pips from thrum plants which may be another success story (I hope). I should have a short article in the Southern Year Book this year and perhaps another in the Northern. The Southern will be on 'Gold-Laced fives and sixes' and the Northern on 'Hybrids of P. Julia.' I keep trying. I dream of a book one day on such things. Cy Happy has been most helpful and tells me I can quote his articles. I may have to scourge his photos too. Particularly that one of his Double Auricula. Bernard M. Smith, 'Windways' 35 The Drive, Gravesend, Kent DA12 4BY, England, U.K.

Primroses are lushly green and having a late fall growth, so I look forward to a good springtime show.

I do a lot of seed work besides Primula and am always in need of a cheap source of transplant media. I have discovered one which may be of interest to you and various clubs.

Large nurseries, especially wholesale types, always produce more plants than they can sell. The excess are dumped on a pile "out back." I am buying this "compost" at $5.00 a yard—and they load it!

Perhaps a few phone calls in your area could locate similar sources of potting material. All or most of it will have fertilizer salts in it and maybe some pesticides. It will have to be screened. A plus, is some of the plants you screen out are as desirable as any you can grow. I got almost a dozen gallon-sized delphiniums in the last batch I bought.

Leaching or composting for a time should take care of any problems, including stray seed. Joe Dupre, 2015 N. Avenue, Anacortes, WA 98221.
From The Seed Exchange  
by Ross and Helen Willingham  
Seattle, Washington

In November of 1972 as Helen and I were returning to our Seattle home from a year of working in Eugene, Oregon, we stopped at the Chehalis Rare Plant Nursery to chat with Dorothy and Herb Dickson. They informed us the Seed Exchange Chairman was unable to continue, and Al Rapp, the new President of the APS, was asking for assistance. After consulting with each other at length, a decision was reached to offer the services of the Willinghams. Al eagerly accepted our offer and supplied us with a used refrigerator for seed storage, a few seed, a small box holding a variety of supplies; and a very minimal amount of money in the seed exchange fund. With these meager provisions our new project had begun.

Helen and I had previously helped Fayme Haverty when she was chairman of the seed exchange, so we were not entirely sailing into foreign waters. We had assumed the task would not be as great, since the Society had decided to limit the seed exchange to strictly primula. Eliminating the vast amount of other genera could actually make it a manageable project.

Successful first year
An appeal was immediately sent out for seed donations, and a collection was made of all the seed catalogues that could be found. Next was to find a supply of small, glued envelopes to mail the seed packages in. Mixing glue and gluing small envelopes was too messy and time consuming. First year efforts resulted in a good, but modest seed list for the APS exchange.

Finances
Tackling the finances of the exchange fund was the challenge to subsequently face. A publishing company had to be found that would print the seed list for a price the exchange could afford. Gradually, the funds were able to be increased, until the time came that the seed exchange was able to retain enough money for the next year’s expenses. Sometimes there was even enough in the account that allowed some to be transferred to the general fund of the APS.

Those first struggling years, we were very fortunate in receiving welcomed help from members of the APS living close by. These last six years Helen and I have been fortunate in being able to handle the seed exchange ourselves.

Routine procedures
As the donated seeds are received they are registered as to the kind of seed and the name of the donor. Also noted in the ledger is the amount and condition of the seed received. This is important in estimating the work schedule, as there have been times when it has taken hours to thresh and clean seed. To insure a careful count of the seed a physician’s head band with a magnifying glass is used by Ross and Helen has a lighted table magnifying glass in a frame.

When the amount of donated seed is small, but the quality is excellent, the seed has to be counted before packaging in order to determine the number of seeds that will be shipped in each envelope. If at all possible, when small amounts of seed are received from volunteers, the supply is augmented from commercial sources.

Small quantities of hybridized seed which cannot be obtained from any commercial source have sometimes, in the past, been combined with those of similar growing habits to make a specialized mixed packet. Some growers thought it exciting to see what germinated.

Late donations cause problems
Lately, with the high demand for good seed, it has been found fruitful to send reminding postcards to former contributors with quality stock, especially if it is getting late in the fall and they have not been heard from. Time slips by fast for busy gardeners.

There also comes a time, when the donations are running very late or small in quantity, a decision is made to contact commercial sources. In many years these sources had to be utilized in order to have a respectable variety for the exchange list and to maintain a wide assortment of seed for APS members to experiment with. The seed exchange has now gotten to the position where it can request commercial sources to reserve choice seed for the APS seed exchange when they harvest for the following year.

After the number of seeds which can be allowed for each packet is determined, the seeds are counted out; wrapped in squares of waxed paper and sealed in the small envelopes. The seed packets are then refrigerated and stored in wooden trays Herb Dickson so kindly made for this purpose.
Registering

Commercial sources are registered right along with the donated seed, guaranteeing credit to be given where credit is due. Noting the different sources of seed also gives the buyer a choice from which to order. All these preliminary steps have to be done as quickly as possible, and then refrigerated, to keep the seed in top condition.

When all the seeds are packaged, the trays are carefully gone through and each packet is given a number. Experience has taught us to put up fifty to one hundred packets of each type of seed for storage in the wooden trays; the remaining are returned to bulk containers and stored for future use.

Mailing of the seed list comes after the seeds are packaged, labeled, numbered and stored. The current membership file is consulted and a list sent to all members of the APS who have paid dues for the previous year as well as those who are current. The seed exchange list has served as a reminder for delinquent members to pay the society dues. This allows order to be placed only by current members. As the seed orders are received, they are carefully registered in a ledger book and processed promptly.

Delays will occur only if the exchange is waiting for additional seed that has been depleted but reordered from its source. After an order has been filled, packed in envelopes, addressed, they are weighed on a postal scale and stamped. During the active season for the seed exchange, daily trips to the post office are required.

World wide donors

In the earlier years the donors for the seed sources were mostly located in Canada, England, Sweden, France, Japan and the U.S.A. Presently, donations are also received from West Germany, Switzerland, Yugoslavia, Czechoslovakia, New Zealand, The Netherlands, Tasmania, Australia and recently the U.S.S.R.

At this time both Ross and Helen wish to thank those members who take the time to write words of appreciation for their efforts in the exchange. These notes brightened the day considerably. Words of thanks are also given to those members who gave assistance to the seed exchange in the earlier, difficult years, after it was taken over by the Willinghams. Who knows? Maybe one of these days one of them will be wanting to take over the old refrigerator and wooden seed tray.

Standard Fluorescent Lights

for Indoor Gardening

by Joe Dupré

Anacortes, Washington

Let's confess at the start, this article is not a scientific treatise. It is intended to motivate home gardeners and primrosers to try their hand at growing plants indoors, under fluorescent lights. The methods outlined in this article work equally well when germinating seeds or starting cuttings. Washington State University does have an ongoing research program investigating the light requirements of plants - which has been the foundation for this report. Much of the research at Washington State University has been conducted by Dr. Robert Horton (Bob), Horticulturist and Superintendent of the Northwest Washington Research and Extension Unit, near Mt. Vernon, Washington.

Facts-of-light

In preparing this paper, three facts-of-light have been gathered from Bob:

1. Seed, seedlings and cuttings grow well under ordinary cool white fluorescent tubes if the plants are regularly exposed to natural sunlight. If this is not practical, mix cool white and warm white tubes in the fixture at the ratio of one to one.

2. Under continuous fluorescent light (i.e. - 24 hours a day) plants grow best when the light intensity is in the 250 to 750 foot-candle range.

3. Maximum benefits in terms of plant growth and economy of operation occur when plants are quite small and closely spaced under the lights.

Inexpensive and efficient

These fluorescent light research findings suit primrosers and home bedding plant growers to a tee. Off-the-shelf fixtures can be used as well as electrical connectors with standard plug ins and inexpensive light tubes. Electrical timers can also be used, but are not necessary if the height of the fixture above the seedlings and plants can be adjusted. Usually by the time winter seedlings get crowded on the bench, day length has increased and outdoor temperatures have moderated to the point where plants can safely be placed in the cool greenhouse, cold-frame, or possibly even in the ground.

Growing under lights is interesting and practical for anyone willing to dedicate some space and purchase the necessary equipment. Growers are reminded that all of the details of good seed, soil or media, sanitation and good garden practices are still
Appropriate Foot-candles for Equal Radiant Energy (Visible 400-850 nm) for Selected Lamps

<table>
<thead>
<tr>
<th>Lamp Abbreviation</th>
<th>Lamp</th>
<th>Foot-candles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbreviation</td>
<td>Cool White</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Warm White</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td>Gro-Lux, Plant Light</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>Gro-Lux-WS</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Agro-lite</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Vita-lite</td>
<td>80</td>
</tr>
</tbody>
</table>

Discharge

<table>
<thead>
<tr>
<th>Lamp Abbreviation</th>
<th>Mercury (all types)</th>
<th>Hg</th>
<th>108</th>
<th>216</th>
<th>540</th>
<th>1080</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Metal Halide</td>
<td>MH</td>
<td>87</td>
<td>174</td>
<td>435</td>
<td>870</td>
</tr>
<tr>
<td></td>
<td>High-Pressure Sodium</td>
<td>HPS</td>
<td>88</td>
<td>176</td>
<td>440</td>
<td>880</td>
</tr>
<tr>
<td></td>
<td>Low-Pressure Sodium</td>
<td>LPS</td>
<td>137</td>
<td>274</td>
<td>685</td>
<td>1370</td>
</tr>
<tr>
<td>Incandescent</td>
<td>INC</td>
<td>35</td>
<td>70</td>
<td>175</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>Incandescent-Mercury</td>
<td>INC-HG</td>
<td>50</td>
<td>100</td>
<td>250</td>
<td>500</td>
<td></td>
</tr>
</tbody>
</table>

Sunlight:

<table>
<thead>
<tr>
<th></th>
<th>Winter</th>
<th>53</th>
<th>106</th>
<th>265</th>
<th>530</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Summer</td>
<td>55</td>
<td>110</td>
<td>273</td>
<td>546</td>
</tr>
</tbody>
</table>

The foot-candle readings given in the Plant Guide are based on Cool White fluorescent lamps. Note that when the table lists 100 fc of Cool White fluorescent, it requires 53 fc from sunlight, 105 fc from Warm White, 47 fc from Gro-Lux, 68 fc from Gro-Lux-WS to give equal energy and equal effectiveness for lighting plants. Check with a lighting engineer to find out what kind of artificial lamps are used to light the space.

LAMPS AND PLANT RESPONSE

<table>
<thead>
<tr>
<th>Lamp Abbreviation</th>
<th>Lamp</th>
<th>Plant Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorescent - Cool White (CW) and Warm White (WW).</td>
<td>CW WW</td>
<td>- Green foliage expands parallel to the surface of the lamp. - Stems elongate slowly. - Multiple side shoots develop. - Flowering occurs over a long period of time.</td>
</tr>
<tr>
<td>Fluorescent - Gro Lux (GL) Plant Lights (PL).</td>
<td>GL</td>
<td>- Deep-green foliage which expands, often larger than on plants grown under CW or WW. - Stems elongate very slowly, extra thick stems develop. - Multiple side shoots develop. - Flowering occurs late, flower stalks do not elongate.</td>
</tr>
<tr>
<td>Fluorescent - Gro Lux-WS (GL-WS), Vita-lite (VITA), Agro-lite (AGRO) and Wide Spectrum lamps.</td>
<td>AGRO/WS</td>
<td>- Light-green foliage which tends to ascend toward the lamp. - Stems elongate rapidly, distances between the leaves. - Suppresses development of multiple side shoots. - Flowering occurs soon, flower stalks elongated, plants mature and age rapidly.</td>
</tr>
<tr>
<td>High Intensity Discharge - Deluxe Mercury (HG) or Metal halide (MH).</td>
<td>INC</td>
<td>- Similar to CW &amp; WW fluorescent lamps compared on equal energy. - Green foliage which expands. - Stems elongate slowly. - Multiple side shoots develop. - Flowering occurs over a long period of time.</td>
</tr>
<tr>
<td>High Intensity Discharge - High Pressure Sodium (HPS).</td>
<td>HPS</td>
<td>- Similar to Gro Lux and other color improved fluorescent compared on equal energy. - Deep-green foliage which expands, often larger than on plants grown under H and MH. - Stems elongate very slowly, extra thick stems develop. - Multiple side shoots develop. - Flowering occurs late, flower stalks do not elongate.</td>
</tr>
</tbody>
</table>

Cautions

If the unit is located in a humid environment, a ground wire should be attached to the metal fixture, and a standard 3-prong grounded electrical plug used on each light.

A three tier light unit

An example of how the lighting research information can be translated into a germination and growing unit would be as follows:

Begin with (3) 2 feet x 4 feet trays, with each tray separated 2 feet vertically, and (2) four-tube fluorescent fixtures (which can be obtained from salvage). The fixtures are hung by chains from the top and the middle trays allowing the growing under fluorescent lights to be done in the two lower trays. The top tray can be used for storage if located in a basement, or where natural light is unavailable. The unit can be constructed from standard lumber widths; the bottoms of trays made from 1/4 inch exterior plywood, and edged with 1/2 x 2 trim if desired. The three trays are bolted to 2 x 4's standard supports. All of the wood should be treated with copper napthenate or other wood preservers.

Cautions

If the unit is located in a humid environment, a ground wire should be attached to the metal fixture, and a standard 3-prong grounded electrical plug used on each light.
LAMPS AND PLANT RESPONSE—Continued

<table>
<thead>
<tr>
<th>Lamp</th>
<th>Plant Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Intensity Discharge - Low Pressure Sodium (LPS)</td>
<td>Extra deep-green foliage, bigger and thicker than on plants grown under other light sources.</td>
</tr>
<tr>
<td></td>
<td>Stem elongation is slowed, very thick stems develop.</td>
</tr>
<tr>
<td></td>
<td>Multiple side shoots develop even on secondary shoots.</td>
</tr>
<tr>
<td></td>
<td>Flowering occurs, flower stalks do not elongate.</td>
</tr>
<tr>
<td></td>
<td>Exceptions: Saintpaulias, lettuce, and Impatiens must have supplemental sunlight or incandescent to insure development of chlorophyll and reduction of stem elongation.</td>
</tr>
</tbody>
</table>

Incandescent (INC) and Incandescent-Mercury (INC-HG) | Paling of foliage, thinner and longer than on plants grown under light sources. |
| | Stem elongation is excessive, eventually become spindly and easily breaks. |
| | Side shoot development is suppressed, plants expand only in height. |
| | Flowering occurs rapidly, the plants mature and senescence takes place. |
| | Exceptions: Rosette and thick-leaved plants such as Sansevieria may maintain themselves for many months. The new leaves which eventually develop will elongate and will not have the typical characteristics of the species. |

One additional caution; the heat given off by the ballasts must be considered. If a multi-tiered unit is planned, consideration should be given to what effect the heat from each fixture will have on the tier or tray above it. Either allow some air space or insulate to prevent heat transmission to the seed trays or plants above the fixture. A small fan may be a worthwhile addition. This would also increase air circulation among the plants.

Other available information

Foot-candle light intensity charts and other data is available, usually free, from the customer service department of all light bulb manufacturers or their salesmen. Another handy source is USDA Home and Garden Bulletin No. 220. Single copies may be obtained free from your local Extension Service Agent or from the Office of Governmental and Public Affairs, U.S. Department of Agriculture, Washington, D.C. 20250.

Additional light gardening information can also be obtained from: Gardener's Library, 300 Mass. Ave., Boston, MA 02115; Learn to Grow Under Artificial Light ($1.75 ea.); Flowering Plants for Light Gardens ($1.00 ea.); Light Garden Construction ($2.50 ea.); Seed Propagation ($1.25 ea.); Light Garden Primer ($1.25 ea.); ($0.50 per book for postage and handling).

ILLUMINATION IN FOOTCANDLES AT VARIOUS DISTANCES FROM COOL WHITE OR WARM WHITE FLUORESCENT LAMPS

<table>
<thead>
<tr>
<th>Distance from Lamp</th>
<th>FC12T10</th>
<th>F40-U</th>
<th>F40-U</th>
<th>2-F40-U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet</td>
<td>0-0</td>
<td>0-0</td>
<td>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td>0.5</td>
<td>330</td>
<td>140</td>
<td>150</td>
<td>240</td>
</tr>
<tr>
<td>1</td>
<td>140</td>
<td>45</td>
<td>50</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>45</td>
<td>20</td>
<td>25</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Standard 40 Watt T12

<table>
<thead>
<tr>
<th>Distance from Lamp</th>
<th>2-F40</th>
<th>2-F40</th>
<th>4-F40</th>
<th>6-F40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet</td>
<td>0-0</td>
<td>0-0</td>
<td>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td>0.5</td>
<td>500</td>
<td>700</td>
<td>900</td>
<td>1000</td>
</tr>
<tr>
<td>1</td>
<td>260 (200)</td>
<td>400 (260)</td>
<td>600</td>
<td>760</td>
</tr>
<tr>
<td>2</td>
<td>110 (100)</td>
<td>180 (150)</td>
<td>330</td>
<td>450</td>
</tr>
<tr>
<td>3</td>
<td>60 (60)</td>
<td>100 (90)</td>
<td>100</td>
<td>140</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>60</td>
<td></td>
<td></td>
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</table>

1500 MA T12-T17

<table>
<thead>
<tr>
<th>Distance from Lamp</th>
<th>2-F48</th>
<th>4-F48</th>
<th>6-F48</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet</td>
<td>0-0</td>
<td>0-0</td>
<td>0-0</td>
</tr>
<tr>
<td>1</td>
<td>900</td>
<td>1700</td>
<td>2000</td>
</tr>
<tr>
<td>2</td>
<td>400</td>
<td>740</td>
<td>1100</td>
</tr>
</tbody>
</table>

INCANDESCENT

<table>
<thead>
<tr>
<th>Lamp</th>
<th>Standard Lamp</th>
<th>INCANDESCENT PAR-38</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 W</td>
<td>60 W</td>
<td>75 W</td>
</tr>
<tr>
<td>1</td>
<td>34 (17)</td>
<td>375 (40)</td>
</tr>
<tr>
<td>2</td>
<td>8 (7)</td>
<td>167 (40)</td>
</tr>
<tr>
<td>3</td>
<td>4 (3)</td>
<td>94 (50)</td>
</tr>
<tr>
<td>4</td>
<td>(double values with reflectors)</td>
<td>60 (40)</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additional notes:

1. Values in parentheses are footcandles one foot on either side of lamp perpendicular to distance below lamps.
2. Bottom views.
3. End views.
4. End views.
5. Values in parentheses are footcandles one foot on either side of lamp perpendicular to distance below lamps.
Pop Bottle Gardening
by Rosetta Jones
Kent, Washington

Failure of seed to germinate is often due to drying out after the seed has imbibed water but before any sign of life can be seen. The seed is no longer dormant and is very vulnerable at this stage.

A seed starter made from a two liter plastic pop bottle can eliminate this problem. Once the medium is moistened and planted, one never has to water again. The water circulates back into the soil and will sustain the seedlings until they are ready for pricking out.

Mini-greenhouse
The bottle cuts easily with scissors. Punch a hole in the side with a knife so the scissors can be inserted and cut the bottle in two — then cut along the line near the bottom. Cut the top back so the lower edge fits into the inside of the bottom part. It is important that it fits inside the bottom edge so the water can condense on the upper part and run back down into the medium. Do not put a drain hole in the bottom. This makes a mini-greenhouse that can accommodate up to 50 seeds or as few as one or two.

Use a sterile medium and mix with water until all the soil is moist. Sprinkle the seed on top and sift a very fine layer of sterile soil, find sand or perlite over the seed to anchor the primary roots. Put the plastic bottle top on and place in good light, out of direct sun, and forget it.

The metal bottle cap is set on but not tightened. This allows the air in but keeps algae and fungi spores out. If one wants to freeze and thaw the seed, it is easy to do in this container.

Potential problems
Things can go wrong. Watch out for the following as potential problems:
Setting the container in hot sun (this will cook the seedlings — they will not dry out, but they surely cook); using liquid fertilizer to moisten the soil (this will cause the seedlings to come up and promptly die).

Common sense helps in growing from pop bottles; a little will help your plants bubble with efflorescence.

Editors note: Rosetta has found it best to leave the caps on the bottle, especially if the mini-greenhouses are kept on a greenhouse bench with a misting system, or if watering is done with a hose. Excess water from the spray can enter and accumulate in the mini-greenhouse and cause the seedlings to float.
Primroses as House Plants

by Dennis Thompson
Seattle, Washington

Many of the old plant books discuss primroses as suitable parlor plants. In the Victorian homes a plant room or conservatory was often located off one side of the parlor. Homes were rarely heated except for the rooms being immediately used. The parlor was reserved for formal entertaining and the area might drop to near freezing. In this climate with plenty of light, primulas were excellent subjects. They could be forced by bringing plants from a cold frame into a slightly warmer room—but the room was neither so warm nor so dark that the leaves and stems stretched.

Wide variety for homes

Improvements in heating and efforts to conserve more heat led to the demise of primroses as practical plants for the home. With the exception of Primula malacoides, you no longer see primulas being handled by plant shops or florists. (Personal prejudice: of all plants to survive the transition, P. malacoides with its frowsy blooms and irritating leaves, tends to give the genus Primula a bad name.) There is still an excellent niche for primroses as house plants, but few people, even primula enthusiasts, are taking advantage of it. No one seems to think anything of purchasing bulbs (daffodils, tulips, hyacinths or even crocus) or chrysanthemums which may last only a short time indoors as house plants. Neither do people avoid cut flowers because they last only a short period of time. Freezing pollen may be the answer to this frustrating problem.

Home staging

All that is needed to succeed with this sort of use is to have some sort of container to hide the plastic pots (I haven't really been able to understand why red pots are so much more popular with commercial producers than black or green) and to be certain that the containers are not allowed to dry out. My favorite are burls of wood, baskets, and dull, rusty metal. Primroses are also lovely in stoneware pots and even in brass. (Whites, yellows, and pastels tend to produce a better show than the blues and purples under artificial light.) For those primulas that are temperamental about soils and water and are going to spend their lives in pots anyway, containers like those designed by Phil Pearson, Grand Ridge Nursery, Issaquah, WA, for P. marginata are lovely combined with stones, shells, or memorabilia in the house. I often add rocks, or some rather realistic bunnies, or appropriate figurines or driftwood to the setting not only to make it look a little less like a pot of primroses but also to increase the importance and grace of the composition. Seaging is important.

Miniature settings

Small primulas can be worked into small miniature landscapes using lava or tufa rock as a base with the addition of such materials as moss, Saxifraga sibirica, small violets, dwarf shrubs (willows, rhododendrons, potentillas, pines, etc.) and even liverworts. Some may be grown in the stone for rather long periods of time—P. allioni, P. juliae, P. frondosa and similar small plants. These plants can be sub-irrigated by placing the porous stones in contain-ers of water. If you plan to grow the plants for a substantial period in the rock, keep a relatively close eye on them to be certain they do not dry out and that they are not overrun, particularly by moss or liverwort.

Freezing Pollen

In our hybridizing programs, many plants intended for cross pollination may not be blooming at the same time. Freezing pollen may be the answer to this frustrating problem. Pollen for many plants in the Gesneriaceae family has been successfully frozen and used later to pollinate selected plants. Is it also possible to freeze primula pollen for later use? Any information about freezing primula pollen would be appreciated and it is requested to be sent to Irene Buckles, 13732 - 45th Ave. S., Seattle, WA 98168. The results of the compiled information, whether from publications, personal experiences, experiments, success, failures, etc., will be printed in a later edition of Primroses for the benefit of all.
Blue Ridge Mountain Notes

by James F. Long
Marion, Virginia

The preservation of the old forms of primula, as well as the creation of new forms should be of great interest to all growers of primula, no matter what section of the genus they are interested in cultivating.

If not for a very few dedicated individuals, the show and alpine auricula, gold lace polyanthus, double primroses, unusual forms of P. vernaules such as Jack in Green and Hose in Hose, as well as a host of other rare and beautiful primulas might have been lost. Indeed there are many forms of the species with a very slim hold on life.

As an example, there is only one grower that I know of, Barnhaven, who cross pollinates by hand to maintain separate colors in both the acaulis and polyanthus. Without this careful hand pollination, the quality will soon deteriorate and the species will quickly revert back to where it began when Barnhaven was started during the depression days of the 1930’s.

Difficult to locate new growers

Gold lace polyanthus might also have gone by the wayside, if not for a few seed being sent from England to Barnhaven, Oregon for cultivation after World War II.

Double primroses could very easily be exhausted unless some devoted growers continue to cultivate them and try to improve the strain. This work will eventually have to be done by a new breed of growers, who most likely will have to be amateurs. In the past there have been quality minded seed or nursery firms to step in and maintain excellent stock, but now there appears to be no firm or commercial grower who can continue these strains with the present high cost of labor.

There is only one commercial source of quality show and alpine auricula, Mr. Gordon Douglas in England; eventually there will be no reliable source for high caliber seeds. The beginning show auricula enthusiast will be hard pressed to obtain seed from any source.

Proposed preserving program

What I am proposing is some type of organized program for preserving species, where members of the APS can work together as a society. We should try to determine what growers would want to cultivate specific strains or species. Taking primroses as an example; who would want to grow double primroses in a manner to help insure that they will not be lost? Each grower in the program could grow what they like best as well as a specific species or strain that is in danger of being lost. We should try to avoid having everyone working in the same field. Areas where members of the APS might try to start an organized program:

- Show and Alpine auriculas;
- double primroses;
- gold and silver laced polyanthus;
- color separation of acaulis and polyanthus;
- species primulas (this would require a number of growers alone): P. marginata and P. pubescens hybrids.

There are a multitude of areas in which a program of this nature might be effective. If members could choose what they would like to try and grow, and through this fraternity let others know, then a start can be made. A listing of the various growers and their specific areas of interest could be published in the quarterly. A problem might be that not everyone can or will be able to grow specific plants of primula family; in North America, there should be at least one area where some difficult types will grow well.

Obtain seed now

For now there are seed available from the Barnhaven strains and the Douglas auriculas. While these valuable sources still exist, members should purchase a good quantity of seed and make a start this year.

There are no governmental seed reserves to store the seed, such as there are for cereal grains, vegetables, etc. It really is up to us to carry on, or the next generations will be without the beauty of the primula we so love and enjoy. It is sad to think we might not be up to the task, but I sense there is enough enthusiasm with the present limited number of growers to make it work.

Dedicated growers are very thin on the ground as the old saying goes. Take the total membership of the APS, compare this to our population and you see how few there really are. Take a count of the people who cultivate a number of primula in the American Primrose Society and a person can see how the growers dwindle down to a small handful.

Show of hands

For those members interested in a preservation program, but lack knowledge on where seeds and plants might be obtained, the organization would direct them toward potential sources and cultivation techniques.

What is now required is a show of hands; if enough interest is generated, an organization could be assembled through the quarterly. Those interested in participating are requested to indicate this either by writing or sending a postcard to: James F. Long, R#2, Box No. 1, Marion, Virginia 24354.

The only way we are going to help perpetuate the cultivation of primulas is by helping each other out.

The legendary Grey-Edged Auricula, George Lightbody; presumed no longer under cultivation.
Primula Allionii

by Robert C. Putnam
Kirkland, Washington

Farrer said it and said it well: "Primula allionii is the jewel of jewels among our European saxitllle species. It is most rare treasure."

It is a plant of small habit with rosettes of grayish green leaves, usually one to one and a half inches long, covered with glandular hairs and sticky to the touch. Large flowers are born on very short scapes and vary in color from pure white to deep rose-pink, various delicate flesh colored forms and intense shades of rose-red. The colored forms, of course, all have the white eye. P. allionii is one of the first primulas to flower, and in an alpine house they often start in late January, are at their best in February, allionii can be grown in both plastic pots in a sand bench to avoid drying and clay pots, but sink the small clay pots in a mixture of one half grit and one half humus. Fertile soil is almost impossible to keep dry in the damp winter months of the Pacific Northwest. In the authors nursery it has been successfully grown, as have others, in a mixture of one half grit and one half humus.

A standard potting compost consists of one third loam, one third peat and one third grit or coarse sand. For P. allionii add an extra portion of grit, as good drainage is essential and its' best not to use too rich a compost. At the authors nursery it has been successfully grown, as have others, in a mixture of one half grit and one half humus. Lime questioned

In spite of the often repeated advice to treat P. allionii as a lime lover, it has been found perfectly happy in a slightly acid soil. Like many plants it tolerates lime but will also get along without it, regardless of what you may have heard or read otherwise.

Cultural requirements are best summarized as follows:

1. A soil mix ensuring good drainage.
2. Reduce watering in the winter and be careful not to wet the foliage.
3. Groom the plant by removing dead foliage and flowering scapes.
4. Allow good ventilation.

Propagation

Propagation is relatively simple by either division or cuttings. Divide the plant after flowering, usually in June, but it can be done up until fall when pressed for time. Cuttings can also be taken after flowering and are easily rooted in sand. Sometimes seed capsules can be found hidden in the foliage and seed should be sown as soon as ripe. Due to the plants tendency to vary, especially in flower color and form, seed can provide some exciting varieties.

Varieties and hybrids of Primula allionii

P. allionii 'Alba' A pure white. Less robust than the type. P. allionii 'Apple Blossom' A seedling raised by Frank Barker. Light pink flowers with wavy edged petals. P. allionii 'Crowley var.' Dark rose-red flowers. Collected in the wild in 1928 by Dr. Roger Bevan and sometimes goes by the name 'Bevan's var.' P. allionii R. Elliott var. A most attractive variety close to "Apple Blossom" P. allionii "Pulomino var." Distinctive notched leaves. Floriferous Dark flowered variety with curled petals. P. allionii 'Praecox' Early flowering rose-pink. P. Allionii 'Viscountess Byng.' Another Frank Barker seedling with large rounded, rose flowers. P. X 'Barbara Barker' Probably a hybrid between P. allionii and P. bisutia. Large rose-red flowers. P. X 'Beatrice Wooster' (P. allionii x P. marginata "Linda Pope") Larger leaves and many rose-pink, white eyed flowers. P. X 'Barbara Barker' (P. allionii x P. bisutia) A miniature hybrid with deep pink flowers. The slicker leaves allow it to be grown outside. P. X 'Fairly Rose' Probably another hybrid between P. allionii and P. marginata "Linda Pope." P. X 'Gladaline' (P. allionii x P. X pubescens) Bright red flowers with a yellow eye. P. X 'Ivanel' (P. carniolica x P. allionii) An outstanding cross we named for its originator, the late Ivanel Agee of Oregon. Glossy green leaves, solid colored rosy-lavender flowers on two to four inch scapes, without the white eye of either parent. Hardy outdoors in a trough or rich scree with some protection from hot sun. P. X 'Joan Hughes' ('Linda Pope' x P. allionii) A hybrid. A rare, choice, floriferous dwarf with pink flowers. P. X 'Kirkland' (P. auricula x P. allionii) Not much information on this one. P. X 'Margaret' (P. allionii x P. X pubescens) Many large lilac-pink flowers with white eye. P. X 'Miniera' (P. allionii x P. marginata) A natural hybrid with dull green leaves and clusters of short-stemmed rosy flowers. P. X 'Violet Chambers' (P. marginata x P. allionii) Unusual cross by Ivanel Agee. Leaves like a miniature P. marginata. Two inch scapes with lilac-blue flowers. Some of the above may no longer be in cultivation and there are certainly more varieties and hybrids that are not listed here. Tucked away in many obscure alpine houses are varieties that possibly rival any description of this most beautiful alpine plant.
More Memos on Minute Maggots

by Larry Bailey
Edmonds, Washington

In the spring issue of the quarterly for 1981, Vol. 39, No. 1, Cy Happy mentioned in the 'Diary of a Primrose' the potential problems of the sciarid fly, or more commonly called the fungus gnat. As the information was timely for the author's own problem with greenhouse potted auriculas, more information and observations were subsequently gathered on the serious problems of the soil maggots and worms that affect the root structure.

Unfortunately, until fairly recently, the fungus gnat and other minute worms and maggots were not considered a problem with greenhouse potted primulas. The author, for reasons and observations noted in this article, strongly differs with this lackadaisical concept and firmly believes the maggot and worm problem is the most serious problem with which he is presently confronted. The idea that the sciarid fly maggots and other worms eat only decayed and rotted plant tissue can prove to be a serious mistake with any grower.

Open Garden Soil not a Problem

One thing should be noted in reviewing any information on gnats and grubs is that, a completely different set of conditions are established or required for plants grown in the open garden or soil. There are strong indications the soil in the garden either: 1) contains natural predators of these grubs; 2) the root structure of the plants grow faster than the grubs can chew; or 3) the soil conditions are just not conducive to the same destructive grub habitation. Whatever the case, the same problems with pot culture are not noted in the garden, and the reasons why are only speculation.

Much to the chagrin of the auriculas, it has been found there are more than one maggot, grub or minute worm to worry about. After eliminating the bigger grub specimens (fungus gnat maggots, etc.) the more minute species became noticeable. It has been estimated that at the peak of the infestation, at least three and possibly four different types of grubs were working on the pot auriculas. What was most disturbing, was the fact, any single insecticide being used by the author was not successful in eliminating all the various grubs.

More Than One Insecticide Required

Much has been written about the sciarid fly (or fungus gnat) and its possible control. Various insecticides have been used in successful applications; Diazinon, Cygon 2E, Malathion, etc. The effective life of the chemicals in various soils and on the plants will determine the frequency for the need of reapplications. It has been noticed the grubs will reappear (from eggs, etc.) within two weeks or 10 days until eliminated. Repeated applications of alternate types of treatments over many weeks have proven to be the most successful method of handling the various gnat grubs.

After the dark-headed fungus maggot was eliminated with successively stronger treatment of insecticides, a smaller transparent worm or nematode was observed in the crown of unhealthy plants. These minute organisms were almost impossible to see with the naked eye. A microscope revealed that a major infestation was destroying the plants. The 'new found' organisms were seen moving about unmolested in the infected plant crown three days after applying a strong drenching solution of Diazinon. The worms riddled the root and crown tissue with holes. Their damage allowed crown rot to set in quickly.

Elimination of Maggots Reduced Crown Rot

After these observations, a convincing conclusion was reached that many of the present problems of crown rot is instigated by these types of worms. Once the worms or maggots were eliminated, much of the crown rot was relieved without any fungicide treatment. As these observations differ from previous understanding with many experienced growers, other growers comments and personal observations are invited.

Signs of infestation of maggots or worms can be seen with the small dark gnat flying around the plants in the case of fungus maggots. Discoloration of leaves, especially on the tips, as well as mottled leaves (yellow spots) is also a sign of the plants not getting complete nourishment due to damaged root structures. Careful examination of sickly roots will, many times, reveal some organism attacking the roots and not a fungus.

Multi-divisions Signs of Infestation

Another sign of potential infestation is if a plant develops multiple divisions instead of the expected occasional offset. A large colony or active nest can cause a seedling to look more like a cauliflower than an auricula. A possible reason for the multi-divisions is the crown is literally divided by the worms making holes throughout the carrot tissue. Multiple divisions in tight clusters can cause other serious problems, such as botrytis rot being easily established. The greatest infestation of the various organisms was noted in the late summer or early fall, creating an ideal environment for both crown rot and botrytis devastation in the cold, damp, late fall.

Solutions for the problems of multiple infestations of maggots, worms, nematodes, and grubs have not been found in one singular application of an insecticide as of the time of this writing. A trial condition is presently being conducted with Temek 10G (see fall quarterly Vol. 39, No. 4) and eliminating both manure and peat moss from the soil mix. Successful results will hopefully be printed in future editions of the quarterly.

Caution on Insecticides

A word of caution. The use of insecticides, fungicides, or most chemicals can cause unexpected and sometimes extreme allergic reactions to the applicator. The chemical residue in the pots can last a long time (months), causing severe reactions to a grower long after its effectiveness on the pests has expired.

Reprinted from the Yearbook of the National Auricula and Primula Society - Southern Section - 1972 and brought to the attention of the author by Allan Hawkes, Rabley Heath England.

Sciarids on pot plants

With the increasing trend to soilless compost as a growing medium for pot plants, sciarid flies have steadily increased in importance. These insects have been recognized as primarily pests of plant roots for many years but, until recently, most records of damage were to cucumbers growing in traditional beds. However, the species associated with these attacks, Termitosciara perniciosa (Edwards) and Phyllus scabiei (Hopkins) are not known to attack pot plants.
It is generally believed that sciarids are sapprophagous creatures living on decomposing vegetable matter and that their occurrence on otherwise healthy plants is restricted to wounded or diseased tissue. In one interesting case, reported in 1964, Bradyzia paupera Tuomikoski (Hemineurina modesta Stag.) laid eggs and completed its development on the apical leaves of cucumber plants, the larvae skeletonizing the leaves in a manner reminiscent of young lepidopterous larvae. The whole sciarid problem is complicated by the real significance of the word sapprophagous. The larvae of these insects have strong chewing mouthparts which appear capable of destroying coarse tissues regardless of whether these have been softened by bacterial or fungal decay.

In the case of Bradyzia paupera, the species consistently associated with damage to pot plants in Britain, there is abundant circumstantial evidence that it is attracted to newly steamed soil. Assuming this is so and that it lays eggs in the soil, regardless of whether plants are present or not, the frequently reported root damage appears to be accidental and not the selective feeding expected from a primary pest.

**Damage Symptoms**

The first indication that plants are being attacked by sciarid larvae is often wilting in bright sunlight and restricted growth which may be accompanied by discoloured foliage and even premature leaf-drop. If suspect plants are dug up, the youngest roots will usually be severely chewed, and with intensive attacks, the main root may be tunnelled out by larvae which eat away tissues even within the main stem several inches above soil level.

**General Appearance of the Pest**

The female fly is 3.0-3.5 mm long and the male somewhat smaller—usually about 2.5 mm. The sexes are similar in appearance except that the abdomen of the female tapers posteriorly to a sharp point, while the apex of the abdomen of the male is enlarged by a complex copulatory apparatus with a prominent pair of claspers for holding the female. The head and thorax are black, the upper surface of the abdomen is dark greyish brown in the male, and rather lighter in the female. The latter, when carrying its complement of eggs, has a distended abdomen which tends to isolate the cuticular plates so that the flies appear to be banded black and yellow. The whole integument is covered with rows of very minute, fine hairs.

Both sexes are readily distinguished from other small flies by the long 16-segmented antennae which are more than 1.0 mm in length. The wings are transparent and highly iridescent, with an expanse of 5.0 mm in the female and 4.0 mm in the male. When walking, or at rest, the wings are held flat along the back projecting almost to the tip of the abdomen.

The adults have long, slender legs and run rapidly about on the surface of the soil; indeed they are more active as walkers than flies. In general, they fly weakly and are frequently caught in suction traps.

**Life History**

Mating normally occurs within a few hours of emergence and the female often begins to lay eggs the same day.

The eggs are very small (0.24 x 0.12 mm), oval and white or yellowish in colour. They are deposited in small clusters of between 2 and 30 in interstices within the soil—most females lay between 100 and 300 eggs. At 21°C they hatch in 4 to 5 days, but at 16.5°C the incubation period is extended to between 9 and 12 days.

On hatching, the white maggots measure 0.7 mm. They have black, shining head capsules and almost transparent, 12-segmented bodies through which the dark alimentary canal and other internal organs are clearly visible.

There are four larval instars which at 22°C, last five, four, three and nine days respectively. Considerable variability exists in the length of larval life, especially that of the fourth instar. Occasionally, and in apparently unsuitable environmental conditions, the larvae spin a cocoon-like covering of silken threads around themselves. The mean body length of the respective instars is 0.8; 1.4; 3.0; and 5.3 mm.

When fully fed some larvae spin a cocoon of silken thread into which particles of debris and earth are woven and within which they pass an inactive, pre-pupal period of up to 24 hr. Many other larvae, however, form pupae without constructing such cocoons. The pupae, 2.0 mm long, are yellow at first but become light brown and then darker as the fly matures. They are characteristic free pupae, with the antennae, legs and wings fully visible, closely pressed to the body beneath a transparent sheath of cuticle. At 15°C adults emerge from the pupae in eight days, but at 22°C emergence occurs after only four days. Adult flies live for about a week. The life cycle is, therefore, of variable duration but averages six to seven weeks at about 15°C and four to five weeks at 21°C.

When the weather is warm, large numbers of adults may be seen pottering, preparatory to mating—the males elevate and rapidly vibrate their wings at about 45 degrees while they make short darting movements toward the females.

The large number of eggs deposited by each female can lead, within two months of the original infestation, to vast population of adults. The variable rate of larval development tends to obscure the occurrence of distinct generations so that, in well-established infestation, all stages of the pest may be present. This has important implications for control.

In experiments where known numbers of larvae were introduced into small pots containing tomato seedlings growing in compost or vermiculite, larval damage to the roots was similar, irrespective of the medium. However, the degree of damage was proportional to the number of larvae present. Twenty-five larvae per cu. in. of soil reduced the root growth to almost 30 per cent of that in the controls, while 100 larvae per cu. in. reduced it to about 10 per cent of that of uninfested plants.

When these experimental plants were transplanted into larger pots and the respective number of larvae for each treatment was re-introduced, the roots grew away and subsequent was unaffected. This suggests that the economic effect of sciarid infestations is related to the degree of root restriction. Under many circumstances, transplanting to larger pots may be the simplest method of avoiding further damage.

The experiments showed no difference in the degree of root damage between seedlings kept permanently moist and those watered only at wilting.

**Control**

The early literature suggested that a fair degree of control could be achieved by drying out the soil but, apart from its impracticability under commercial conditions, recent observations have not confirmed any useful control by this method.

Within a glasshouse it would, theoretically, be possible to kill off the adult flies as they mature and so prevent further infestation. With smokes or aerosols this is very difficult to achieve as they are lethal for only a short time while the flies are active throughout the daylight hours.
If control measures have to be applied to an existing infestation, drenches of malathion at 0.01 per cent may be applied. About 1 fl. oz. should be used on each 4 in. pot, treating larger pots pro rata. Where species of ornamental plants are to be treated for the first time and for which manufacturers do not give specific directions, a small scale trial should be carried out in the first instance. Ferns and Pilea, for instance, are known to be susceptible to damage by this insecticide.

Whenever pesticides are used, read and follow carefully the instructions on the label...

(Taken from Short Term Leaflet 110 (1970) published by the Ministry of Agriculture, Fisheries and Food, and reprinted by kind permission of the Ministry).


Fungus Gnats
Description — Adult fungus gnats are delicate, gray or dark gray, fly-like insects about 1/8 inch long. They are attracted to light and when present in the house swarm over the windows. The immature forms, which live in the soil, are whitish maggots, and attain a length of about ¼ inch. Maggots are likely to be found in soils with quantities of decaying vegetable matter.

Damage — The maggots cause injury to the root systems by burrowing in the soil. They feed on the roots and crowns of plants. Severely injured plants make little growth, appear off color, and may drop foliage. Adult fungus gnats do no damage but are a nuisance.

What to do — For the control of the maggots in home greenhouses, avoid overwatering of the plants.

To control the grub stage of this pest when it is in the pot plants a malathion should not be used on Antirhinums, Crassula, Ferns, Fuchsias, Gerbera, Petunia, Pilea, Sweet Peas or Zinnias.

It would be wise to treat a few plants of Auricula first to make sure that no damage results."

In a later letter, Mr. Dyke expresses surprise that soil drenches applied for the control of woolly aphis do not also control the sciaridae fly larvae.

Apparently we can take some comfort in the fact that the control of our Sciaridae is not nearly as difficult as that for the Carpet weevil or "Woolly Bear," the fly of which is very similar in appearance to the Sciaridae and which is doing considerable and increasing damage to textiles in a certain area in the south.

Jack Ballard


The latest on the sciara
I have ascertained from Mr. Dyke, the Worcestershire Horticultural Adviser that the larvae of the Sciara fly has caused serious damage to quite a range of crops being grown commercially in peat-based composts.

Incidentally the Sciara or Fungus fly as we call it, is known as the dung fly in the commercial field.

As for control, I quote from his letter:

"Dear Mr. Ballard,

Further to our telephone conversation of 15th December, for the control of Sciaridae flies in small greenhouses for up to eight weeks at a time, strips treated with dichlorvos may be suspended (e.g. Vapona strips).

The editors committee statement of intent: The primary reason for providing a directory of resources is to serve and for the benefit and knowledge of the members of the American Primrose Society. It was only after a considerable amount of discussion that the basic policies governing the selection for these sources were derived: (1) resources listed in the directory need not be limited to association with the American Primrose Society, but be of direct and prime interest to primum growers; (2) the quality of the product or source must be maintained for continuous listing with policing accomplished by members of the APS; (3) listing will be limited to strictly primum growers' interest.

It is presently anticipated that the directory of resources will be updated and published in the quarterly each year, during the winter issue or first publication of each volume. The editors hope that members of the Society will freely share their own 'special' resource throughout the year. If, at the time members come across an interesting item for the directory, they will, right then, drop a post card or note into the mail for the editors committee, then this knowledge can be shared with other members throughout the world.

The editors committee is expecting to add considerably to this directory each year as members are encouraged to request information on specific resources. This directory should be considered a listing of resources shared by members of the American Primrose, Pr umbula and Auricula Society for the continued preservation of the Primula and its various species.

Dates to Remember for 1982
February 26th, 27th, and 28th: American Rock Garden Society - Western Study Weekend at the Western Forestry Center, Portland, Oregon. Info: Ann Lunn, 3040 Northwest Parkview Lane, Portland, Oregon 97229
March 14th: Washington State Chapter (APS) - Study Program at Volunteer Park Conservatory, Seattle, Washington (from 11:00 am - 4:00 pm)
March 20th and 21st: U. Washington Arboretum Foundation Unit Council's 5th Annual Horticultural Exhibit at Southcenter Mall, Seattle. Sat: 10-6, Sun: 11-5,
March 27th and 28th: Tacoma Primrose Society - Annual Primula Show; First Interstate Bank, Lakewood Plaza Shopping Mall, Tacoma, Washington
March 27th: National Auricula and Primula Society (Southern Section) - Primula Show; Church House, Holy Trinity Church, Brompton Road, London, S.W. 7

continued
April 3rd and 4th: National Show of the American Primrose, Primula and Auricula Society - hosted by the Oregon Chapter at the Milwaukie Community Center, 10666 S.E. 42nd Ave., Milwaukie, Oregon (suburb of Portland)

April 9th and 10th: Valley-Hi Chapter (APS) - Annual Primula Show - Beaverton Mall, Beaverton, Oregon

April 16th, 17th and 18th: Eastside Primrose Society - Annual Primula Show - Totem Lake Shopping Mall, Kirkland, Washington

April 24th and 25th: Washington State Chapter (APS) - Annual Primula Show - Meeker Shopping Mall, Kent, Washington

April 24th: National Auricula and Primula Society (Southern Section) - Auricula Show; Church House, Holy Trinity Church, Brompton Road, London, S.W. 7

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June 19th and 20th: Hardy Plant Society - Summer Study Weekend at Edmonds Community College, Edmonds, Washington (Alan Bloom, guest speaker)

July 2nd, 3rd, and 4th: American Rock Garden Society - annual meeting at Boulder Colorado. Info: Division of Conferences and Institutes, Dept. of Housing, University of Colorado, Boulder, Colorado 80310

July 10th: American Primrose Society's annual picnic; Chehalis Rare Plant Nursery (Herb and Dorothy Dickson), 2568 Jackson Highway, Chehalis, Washington

October 25th: Doretta Klabor Chapter (APS) - annual dinner and plant sale at the home of Claire Muller, 2001 Ridley Creek Rd., Media, Pennsylvania

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Societies

**American Primrose, Primula and Auricula Society**

President: Herbert Dickson, 2568 Jackson Highway, Chehalis, Washington 98532

Annual picnic second Saturday in July (10 July 1982): board meetings announced by President.

**Chapters and Affiliations**

**Doretta Klabor Chapter:**

President: Claire Müller, 2001 Ridley Creek Rd., Media, Pennsylvania 19063 telephone 215/366-1995

One dinner meeting and plant sale per year. Will be held Oct. 25, 1982 at the home of Claire Müller. Contact Claire for time.

**Eastern Chapter of the American Primrose Society:**

President: Mr. G.K. Fenderson, Grout Hill, South Ackworth, New Hampshire 03607 telephone 603/835-6439

One show and meeting each year; date, time and place to be announced.

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**Oregon Chapter:**

President: Mrs. William Tate (Etha), 10772 S.E. 40th Ave., Milwaukie, Oregon 97222 telephone 503/654-3361

Meetings held on the 3rd Friday, 8:00 pm, each month at the Milwaukie Community Center, 10666 S.E. 42nd Ave., Milwaukie, Oregon. The Oregon Chapter will host the 1982 National Show of the American Primrose Society on April 3rd and 4th at the Milwaukie Community Center.

**Sequim Primrose Study Group:**

President: Mrs. Elgin Van Sickle (Elizabeth), Rt. 3, Box 308, 654 Marine Drive, Sequim, Washington 98383 telephone 206/683-4744

Meetings are held informally in members' homes; date, time and locations announced.

**Tacoma Primrose Society:**

President: Mr. Tony Trujillo, 11617 Gravelly Lake Drive S.W., Tacoma, Washington 98499 telephone 206/588-2585

Meetings are held the 1st Tuesday, 8:00 pm of each month at the Tensilar Library, Gravelly Lake Drive and Wildair Rd., Lakewood, Tacoma, Washington. The Tacoma Primrose Show will be held on March 27th and 28th, 1982 at the First Interstate Bank, Lakewood Plaza Shopping Mall, Tacoma.

**Valley-Hi Chapter:**

President: Thelma Genheimer, 7100 SW 209th, Beaverton, Oregon 97005 telephone 503/649-3327

Meetings are held on the 1st Thursday of each month at 1:00 pm, at the Far West Federal Savings at Raleigh Hill, 4770 S.W. 76th, Beaverton, Oregon. The Valley-Hi Show will be held April 9th and 10th, 1982 at the Beaverton Mall unless otherwise announced.

**Washington State Chapter:**

President: Mrs. Allan Jones (Rosetta), 6214 So. 287th, Kent, Washington 98031 telephone 206/852-0330

Meetings are held on the 2nd Friday of each month 7:30 pm, at the Kent Commons Building, 1525 - 4th Ave. North, Kent, Washington. The Washington State Primrose show will be held on April 24th and 25th, 1982 at the Meeker Shopping Mall, Kent, Washington.

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Horticulture Societies of Common Interest

**The Alpine Garden Society of British Columbia:**

c/o Thea Foster, 566 Esquimalt Ave., West Vancouver, B.C. V7T 1J4 Canada

Quarterly newsletter; seed exchange.

**The Alpine Garden Society:**

c/o E.M. Upward, Lye-End Link, St. Johns, Woking, Surrey, England

Annual seed exchange.

**The American Rock Garden Society:**

c/o Ronald Peach, Rt. 1, Box 282, Mena, Arkansas 71953

Annual seed listing; quarterly.

**The American Rock Garden Society:**

N.E. Chapter:

c/o Anne M. Pierce, 47 Hight St., Topsfield, Maine 01983

The Hardy Plant Society:

11429 NorthDogwood Lane, Edmonds, Washington 98020

Summer study weekend at Edmonds Community College - June 19, 20, 1982, guest speaker Alan Bloom (Founder, The Hardy Plant Society, England); fall plant sale.

**National Auricula and Primula Society - Midland Section:**

c/o Hon. Sec. Mr. P. Green; Primrose Hill, Bell's Bank, Buckley, Wors., England

Annual yearbook.

**National Auricula and Primula Society - Northern Section:**

c/o Hon. Sec. David G. Hadfield, 146 continued
Queens Road, Cheadle Hulme, Cheshire SK8 5HY England
Annual yearbook.
National Auricula and Primula Society - Southern Section:
c/o Hon. Sec. Mr. Lawrence E. Wigley
67 Warnham Court Road, Buckley, Wors., England
Annual yearbook.

The Scottish Rock Garden Club:
c/o Mr. Robert J. Mitchell, University Botanic Garden, St. Andrews, KY16 8R1, Scotland
Vancouver Island Rock and Alpine Garden Society:
c/o J.C. Lott, 4932 Welsley Road, Victoria, B.C., V8Y 1Y7, Canada

Horticultural Book Dealers:
The Alpine Garden Society’s Publications:
c/o D.K. Haselgrove, 278/280 Hoe St., Walthamstow, London E17 9PL, England (source for Asian Primulas by Roy Green)
Anchor & Dolphin Books; 20 Franklin St., P.O. Box 823, Newport, RI 02840
Beth L. Bibby Books; 1225 Sardine Creek Road, Gold Hill, OR 72525
The Book Chest, Inc., 19 Oxford Place, Rockville Centre, New York 11570
Ferguson, H. Lawrence; Box 5129, Ocean Park Station, Santa Monica, California
Johnson, John; RFD 2, North Bennington, VT 05257
Daniel Lloyd (D. & E. Lloyd); ‘Heather Lea,’ 4 Hillcrest Ave., Chertsey, Surrey, KT16 9RD, England (good source of new and older primula books)
Pomona Book Exchange; Highway 52, Rockton, Ontario, Canada, LOR 1X0 (good buys on some out-of-prints)
Wheldon & Wesleys Ltd.; Lytton Lodge, Codicote, Hitchin, Herts. SG4 8TE England
Woodburn, Elisabeth; Booknoll Farm, Hopewell, NJ 08525 (very good selection of books on primula)

Seeds
Societies:
Alpine Garden Club of British Columbia - c/o Theo Foster, 566 Esquimalt Ave., West Vancouver, B.C. V7T 1J4, Canada
Alpine Garden Society - c/o E.M. Upward, Esq., Lye-End Link, St. John’s, Woking, Surrey, England
American Primrose Society - c/o Ross Willingham, Chairman, Seed Exchange, 2248 S. 134th, Seattle, Washington 98168
American Rock Garden Society - c/o Kenneth Vogel, Director of Seed Exchange, 19795 Excelsior Blvd., Excelsior, Minnesota 55331
Scottish Rock Garden Club - c/o R.H.D. Orr, Esq., 70 High Street, Haddington, East Lothian EH41 3EN U.K.

Commercial and other sources:
Aberchiler Gardens, Gorthleck, Inverness-shire, U.K.
Barnhaven, Brigsteer, Kendal, Cumbria, LA8 8AU England
Blankney Garden, 116 Dundee Road, Perth, Scotland
Burbpee Seed Co., Warminster, PA 18991
Chiltern Seeds, Sunnymede Avenue, Chesham, Bucks., U.K.
Corveron Fils et Cie., CH1225, Chene-Bourg, Geneve, Switzerland
Jack Drake, Inshriach Alpine Plant Nursery, Aviemore, Inverness-shire, Scotland PH42 1QS
Gordon Douglas, 67 Church Road, Great Bookham, Surrey, England (Auricula seed only)

Plants
Plants, Commercial Growers:
Before visiting any of the sources for plants, the editors committee strongly recommends the person(s) make prior appointments.
Alpenflora Gardens, 17985 - 40th Ave. Surrey (Cloverdale, B.C. V3S 4N8 Canada)
Alpenglow Gardens, 13328 King George Hwy., North Surrey, B.C.
Bartoos Gardens (Rosetta and Allan Jones), 6214 S. 287th, Kent, Washington 98031
Chehalis Rare Plant Nursery (Herb and Dorothy Dickson), 11907 Nevers Rd., Snohomish County, Washington 98290
Chehalis, Sieboldii) (Double vernales, Polyanthus, Acaulis Juliae)
Cricketwood Nursery (Dan and Evelyn Douglas), 11907 Nevers Rd., Snohomish, Washington 98290
Far North Gardens, 15621 Auburndale Avenue, Livonia, Michigan 48154 (Mail orders)
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Grind Ridge Nursery, 27801 S.E. High Point Way, Issaquah, Washington 98027
Johnson, Cleas; 6024 197th Ave. E., Sumner, Washington

Far North Gardens, 15621 Auburndale Avenue, Livonia, Michigan 48154
G. Ghose & Co., Townend, Darjeeling, India
Goodwin’s Seeds, Bagdad St 7407, Tasmania, Australia
Herbst Brothers Seedsmen, Inc., 1000 N. Main Street, Brewster, New York 10920
Major V.F. Howell, Firethorn, Oshkosh Way, Calhan, Surrey, England
J.L. Hudson, Seedsmen, P.O. Box 1058, Redwood City, California 94064
P. Kohl & Co., Park Road, Srinagar, Kashmir, India
George W. Park Seed Co., Inc., Greenwood, South Carolina 29647
Plants of the Southwest, 1570 Pacheco Street, Sante Fe, New Mexico 87501

Lamb Nurseries, E. 101 Sharp, Spokane, Washington 99202
Howard Larkin, 8814 - 33rd West, Tacoma, Washington (Marie Crousse)
International Growers Exchange, Inc., P.O. Box 397, Farmington, Michigan 48024
Oliver Nuseries, Inc., (Priscilla Galpin) 1151 Bronson Road, Fairfield, Connecticut 06430
The Plant Farm (Robert Putnam), 11811 Northeast 73rd, Kirkland, Washington 98033
Primrose Acres (Beth Tait), 1415 - 84th Ave. E., Bothell, Washington 98021
The Rock Garden (Marjorie and George Walsh), Lithfield - Hallowell Road, RFD 2, Lithfield, Maine 04350 (Mail order)
Siskiyou Rare Plant Nursery, 2825 Cummings Road, Medford, Oregon 97501
Vickey Sauer, 13561 - 196th S.E., Renton, Washington 98055
Spring Hill Farm (Ruth Huston), P.O. Box 42, Gig Harbor, Washington 98335
Alda Stich, Freedom, Maine 05951 (plants for barter or sale between Mothers Day and Fathers Day)
Plant Exchanges:

Editors Note: Most Primula Shows by the American Primrose Society chapters have sale tables for Primula species as well as for the various types of Primula Show plants.

Gardening Supplies

This section is not intended to replace the friendly local hardware store or nursery, but to provide the APS members with an expanded knowledge on potential sources for the 'special' item not found elsewhere. Members are requested to share their resources to allow this section to expand into an invaluable resource for all primula lovers.

Walter F. Nicke; Box 667G, Hudson, NY 12534; (Mail orders - supplies and tools of a wide range and selection).

Smith and Hawken Tool Company; 68 Homer, Palo Alto, CA 94301; (Mail orders - British gardening tools of quality).

The Kinsman Company, Inc.; 201 River Road, Pt. Pleasant, PA 18950 (Mail orders - shredders, compost bins, soil sieves, etc.).

Greenhouse Manufacturers:

Inquiries for names and addresses of local distributors and installers should be able to be obtained by a note to the manufacturer. The editors committee is not aware of any charge for the brochures from the companies listed.

Aluminum Greenhouse Inc., 14605 Lorain Ave., Cleveland, Ohio 44111
Four Seasons Greenhouses, 910 Route 110, Farmingdale, New York 11735
Gothic Arch Greenhouses, P.O. Box 1564, Mobile, Alabama 36633
J.A. Nearing Co., Inc. (JANCO), 9390 Davis Ave., Laurel, Maryland 20810
Lord & Burnham, Division of Burnham Corporation, Irvington, New York 10533
National Greenhouse Company, P.O. Box 100, Pana, Illinois 62557

Sundri-Built Manufacturing Company, 11304 S.W. Boones Ferry Road, Portland, Oregon 97219
Sunglo Solar Greenhouses, 4441 26th Ave. West, Seattle, Washington 98198
Turner Greenhouses, Highway 117 South, Goldsboro, North Carolina 27534

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Lord & Burnham, Division of Burnham Corporation, Irvington, New York 10533
National Greenhouse Company, P.O. Box 100, Pana, Illinois 62557

Resource Directory 1982

American Primrose Society Seed Exchange

Open to all members in good standing. No refunds due to high cost of mailing. Exchange will close May 1, and no orders will be handled after that date.

Minimum charge: $2.50 for 10 packages - includes all postage and handling. However, a self-addressed stamped envelope will be appreciated. Overseas members should remit $2.75 to cover additional postage.

Make remittance payable to Director of Seed Exchange: Ross E. Willingham 2248 So. 134, Seattle, WA 98168. Members in U.S.A. and Canada may remit by personal check, bank draft or postal money order (U.S. funds please). Overseas members should remit by international money order or bank draft in U.S. funds.

Note: Numbers show in parenthesis equals amount of seed per package. * denotes larger packet available (times amount of seed) @ 50 cents.

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4. MINI HYBRIDS, AF (30)
5. GARDEN BLUE, AF-AA(15)
6. GARDEN AURICULA HAIR COLOR, Q(30)
7. GARDEN LIGHT COLORS, Q(30)
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P. rosea

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American Primrose Society

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Membership
Dues of $10 a year are payable Nov. 15. Membership includes four issues annually of the Quarterly, cultural chart and seed exchange privileges. Three years for $25. Life membership, $100; garden club affiliated societies, $10 a year; library and horticultural societies, $10 a year; second member in family, $1 a year. Overseas members, $10 a year; please send by international money order. Send dues to the treasurer.

Publications
Back issues of the Quarterly are available. Order from the secretary.
Manuscripts for publication in the quarterly are solicited from members and other gardening experts, although there is no payment. Please send articles and photographs to the editor's committee at 1570 - 9th Ave. N., Edmonds, WA 98020.
Advertising rates per issue: full page $60; half page $30; quarter page $15; eighth page and minimum $10. Submit advertising to the editor.

Seed Exchange
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Did you remember?
Please double check the membership roster and mailing label for correctness of your name and address. Errors and/or changes should be directed to the APS Treasurer, G. K. Fenderson.