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ALL-AMERICA SELECTIONS

ALAMEDA NURSERY

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The Rocky Mountain Seed Company
1321 15th Street
MAin 3-6233
Denver, Colorado

APRIL
Vol. 20
No. 3

The Green Thumb
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A non-profit, privately financed organization
EA 2-9656
MA 3-1133, Ext. 428
909 YORK STREET
DENVER 6, COLORADO

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A Progress Report — Helen Marsh Zeiner
Things to do in April — Joseph W. Oppe

THE COVER
EVENING PRIMROSE, Oenothera albicaulis
Original drawing from the Emma A. Ervin collection.
## CALENDAR of EVENTS

Every Saturday Morning — 9:15 a.m., KLZ Radio  
The Green Thumb Program, Herbert Gundell, Denver County Agricultural Agent  
Every Saturday Afternoon — 3:30 p.m., KIZ-TV, Channel 7  
The Weekend Gardener, Herbert Gundell

### AT THE BOTANIC GARDENS HOUSE

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A REMINDER — Arbor Day is Friday, April 19th — plant a tree!

### Notes and Notices

**8TH ANNUAL STERLING BOWL TOURNAMENT** sponsored by Jackson and Perkins will take place June 26th in Newark, New York. Mrs. John Scott, Kibitzers Garden Club, is the only entrant in the Rocky Mountain area who met with the necessary qualifications to compete in this tourney. She receives an all-expense paid trip and promises to do her best to bring the Sterling Bowl back to Colorado.

**ARBOR DAY — APRIL 19TH** There will be a tree planting ceremony at Denver Botanic Gardens, 909 York Street, at 9:00 a.m. Civic Garden Club.

---

**Your membership in**

**DENVER BOTANIC GARDENS**

entitles you to these things:

- THE GREEN THUMB, Colorado's only garden magazine, written for the Rocky Mountain region by experts in their fields.
- Use of Botanic Gardens House for flower shows, classes, study groups, and other meetings pertaining to horticulture or botany.
- Use of the Helen Fowler Library at Botanic Gardens House.
- Use of the Kathryn Kalmbach Herbarium at Botanic Gardens House.
- Answers to your garden questions on flowers, shrubs, trees, and lawns.
- The benefits of the research work performed by Botanic Gardens' staff.

Your membership also benefits your state, your city, and your community.

---

**Heigh Ho! Plan for the Plant Sale in May!**

---

**Books and Booklets For Sale**

The following publications are available for purchase in the office at Botanic Gardens House, 909 York Street:

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<td>Colorado Wild Flowers by Harold and Rhoda Roberts (a museum pictorial)</td>
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<td>Fruit Key (identification of plants by their fruit) by William Harlow</td>
<td>.60</td>
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<tr>
<td>Handbook of Plants of the Colorado Front Range by William Weber</td>
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<td>How to Grow Good Gardens in the Sunshine States by George Kelly</td>
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<td>How to Identify Plants by H. D. Harrington and L. W. Durrell</td>
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<td>Saga of a Forest Ranger by Len Shoemaker</td>
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<td>The Secret of the Green Thumb by Henry and Rebecca Northern</td>
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<td>Twig Key (identification of trees and shrubs in winter) by William Harlow</td>
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**Also available:**

- A mimeographed partial list of the flowering plants of the Mt. Goliath Alpine Garden Trail Area, compiled in 1962 .................................................. .40
- Green Thumb folders, will hold one year's issues .......................... .25
- Botanic Gardens note paper — 15 notes to a box ............................ 1.00
再次全年植物节。丹佛植物园正在策划一场色彩斑斓的植物节，将在五月举办。特别努力是确保获得最好的质量苗圃的植物，自家种植的植物和许多不寻常的植物，如已在丹佛植物园下测试的植物。

通过将灌木、乔木、一年生植物、多年生植物、草本植物（包括西红柿和辣椒）、兰花、仙人掌、非洲紫罗兰和边界植物分组，可以使选择更容易。许多这些植物将会非常不寻常，在某些情况下是丹佛的新产品。

您的注意力被吸引到特别的预订单。如果您想拥有任何特殊植物或灌木的一定数量，您应该提前下单，我们会尽力为您保留。请拨打克莱德·利温顿，777-9490；弗兰·莫里森，424-0706；或者罗宾·朗，825-1992来下单。

克莱德有一个真正的“邻居阻止者”，一种白色天竺葵，名为“Sealfoam”。使人联想到狂欢节的那一天，将会提供额外的临时食品“值得一试”和古董物品。特别的兴奋将由双期抽奖提供，包括一束月花束，黄金珠宝，茉莉的美洲狐，6英尺高的蓝云杉，5码的泥炭和羊粪——在其他抽奖项目中。这些抽奖将会在最后一天的最后两个小时中进行。您不需要在场就可以赢。

自然地，我们需要你帮助提供在您的温室或花园中的特别植物。请在此处提供给定人员进行联系。

由于已经表现出了很好的合作，我们正在进行这项销售，您会发现它非常成功。我们要确保丹佛植物园的更好。

支持并参加5月11日和12日（母亲节），上午10:00到下午6:00，在植物园大厦，909约克街，丹佛的年度植物节。

KROH BROS. NURSERIES
首选苗圃的股票
落基山脉和平原地区
P.O. Box 536
Loveland, Colorado

特此邀请您参加KROH BROS. NURSERIES的年度盛宴，为您的花园添置新的绿色生命。
For the average gardener, a greenhouse is just a pipe dream. However, our desire to own one was so strong that when we learned of a wooden greenhouse which had to be removed from its location, we bought it, tore it down, hauled it to our own back yard and rebuilt it. Since then we feel that we were rather foolish to have done this when we could have had one of the small prefabricated aluminum greenhouses for only slightly more money and with much less work, and we would have ended up with a much more durable and attractive result. Nevertheless, our greenhouse has given us so much pleasure that we want to share our experience with others and urge them to investigate the small greenhouse for their own back yard.

An amateur carpenter can build a satisfactory greenhouse of moisture-resistant woods, such as redwood, using either glass or rigid plastic for light. Prefabricated greenhouses come in such an infinite variety of styles, sizes and shapes that it is fascinating just to investigate them. Some can even be fastened to a house and used as an extra room. The most satisfactory greenhouse is one that best suits the needs of the individual owner and the types of plants he wishes to grow.

We must admit that in the type of greenhouse we have the upkeep is of major concern. The constant painting necessary on a wooden greenhouse causes us to hope some day for an all-aluminum one. Also, size is very important. Our greenhouse, which measures 9 by 11 feet, is proving to be too small. Almost everyone with a small greenhouse faces this problem sooner or later. Be sure to consider a greenhouse a little too large for your needs at first rather than having the expense of adding on later. Of course, it is easy enough to add onto the greenhouse if you plan for this in the beginning; however we didn't.

In our climate, heating is the next most important concern, followed by the problem of ventilation. Just any heater will not do (we found this out the hard way). A gas heater must be vented to the outside as gas fumes will kill plants. Any greenhouse company has heaters and it is worth every penny to buy the best you can get. Since sunshine coming through glass rapidly builds up heat, the temperature inside a greenhouse has to be watched carefully. There are automatic controls available to open and close the vents on the greenhouse roof. As yet we have not been able to install these. Therefore, we must control these vents manually. Once you know what the combination of outside temperature and sunshine will do, it is fairly easy to determine when you must open and close these vents.

The cost of the greenhouse will depend a great deal upon its size and the type of equipment you choose. However, compared with other hobbies, we think the cost is quite reasonable. A good greenhouse can cost considerably less than a new car and compares favorably with such hobbies as skiing, golfing, hunting or fishing. You can load your greenhouse with the most exotic and expensive plants or you can fill it at modest cost with a few dollars worth of seeds.

Our greenhouse is a free-standing one with a substantial base of cement blocks. We chose a location where it gets the sun all winter long with protection from the north winter wind. We kept it fairly low and even dug out the sod so we are a little below the ground, since we don't plan to grow tall things. In a greenhouse it is important to have a dirt floor even though you will want to pave your walkway. We made our benches of redwood set upon concrete blocks. We find ourselves rearranging these about every year in an effort to provide more room and better light conditions. This is our fourth winter with our greenhouse and during this time we have tried a great variety of plant material. We have come to the conclusion that greenhouse growing is not as simple as we thought. For instance, our collection of orchids just didn't thrive in the same room with carnations, geraniums and various other plants. We will either have to build a special section for our orchids where...
we can keep them warmer and more humid, or do without all but the most hardy. We used to visualize armfuls of cut flowers from the greenhouse all winter long. This cream did not materialize. Because of the short winter days many plants will not flower. Even the bed of carnations is quite stingy at times.

We have invested in a variety of gardening and greenhouse books and have discovered the secret of getting our poinsettia to flower at Christmas; how to propagate various houseplants; what the light and heat requirements are for the plants we wish to grow. Every bit of new plant material calls for attention and study and we love it.

The main use for our greenhouse is to winter-over plants for our garden. We take up various bedding and planter box plants every fall and move them into the greenhouse. At first we took cuttings to root and form new plants, but with all the activities connected with our school-age children we found our time limited. Now we simply pot up the old plants and clip the tops back severely. It doesn't really matter to us when they don't bloom well again until almost time to plant them out in the spring.

Two things we would not want to be without are our carnations (which we replace every fall with fresh new plants from a commercial grower) and a few tomato plants which we place directly in the dirt under the benches. We hoped to have tomatoes all winter, but find ourselves forgetting to get the seeds planted in time in the late summer. Our ripe tomatoes actually don't materialize until late spring or early summer, but they are delicious any time we have them.

One problem we have had with our greenhouse is watering. I feel this is a problem everyone has—even with plants in the house. For awhile we did not have water piped into our greenhouse and we were carrying it out in buckets—warmed so it would not chill the plants. This took a great deal of work for it often required as many as four buckets a day. Perhaps it was a labor of love, but it did get tiresome! This past summer we bought plastic pipe, the kind used in outdoor sprinkling systems, and dug a trench 18 inches deep between the house and the greenhouse. Then we tied into both the hot and cold water lines inside the house, put in valves so that we could mix any temperature we wanted, and ran the plastic pipe into the greenhouse. Inside we installed an elaborate system of pipes and tiny plastic sprinkling nozzles. We turn this sprinkling system on early in the morning when we want to water and the watering is done in just a few minutes. This appears to be settling our watering problems and we also feel that the plants are doing much better now.

The greatest pleasure of all from our greenhouse is growing our own plants from seeds. We prefer annuals for our outdoor flower beds and we have favorites which we like to grow ourselves. Since we are active in the rose testing program of the Men's Garden Clubs of America, we have a long, narrow bed of many varieties of roses. It takes a good many flats of annuals to edge this bed, and after several summers we have found the Spungold Marigold and the Blue Mink Ageratum the most satisfactory. We also try to grow as many of the new varieties of annuals as we can accommodate. We start these seeds in small pans of milled sphagnum moss set over the greenhouse heater and have had the good fortune of developing many flats of healthy and sturdy plants each spring. To harden off these tender plants, we built a cold frame on the east side of our greenhouse. We find this indispensable. Not only does it toughen up the plants so they thrive when we set them into the ground, but it also serves to give us extra space at the critical time when our greenhouse is much, much too small to hold all these tiny plants every spring.

During the summer our greenhouse is almost empty except for a few plants which do not seem to mind the heat. We are trying to train a Concord grape vine over the top for shade, and perhaps eventually we shall be able to use it for plants even in the summer. Who knows, maybe we shall even install a refrigeration unit some day. There is just no end to the things one can do with a greenhouse. We urge all of you who love to garden to try a greenhouse of your own some day soon!

**TURF:**

The Quick Solution To A Good Lawn

**IVAN LEECH**

It has been said that next to automobiles more persons discuss the subject of lawns than any other. Be that as it may, one can hardly dispute the importance of a fine lawn to the home landscape.

Today's turf nurseries are producing varieties of lawn grasses that are particularly suited to special environmental and cultural situations. This means that the lawn can actually be designed to suit the habits and tastes of the individual family.

Of all the grasses grown in Denver, Kentucky bluegrass is still the favorite. Its long growing season, ability to adapt to a variety of conditions and fine quality make it the perennial favorite. Merion bluegrass, a variety of Kentucky bluegrass, should also be considered by the individual desiring a truly high-quality lawn. The big
The drawback of Merion bluegrass is that it requires more maintenance than Kentucky bluegrass.

Let us now compare a few of the advantages of sodding over seeding. We can all appreciate the struggles which the homeowner goes through in establishing a lawn from seed. The establishment of a good lawn from seed usually requires from two to three years. This, of course, depends upon management and weather conditions. Sodding can be done in a matter of hours and under average conditions the turf will be rooted down within a month.

Generally, a lawn can be seeded only in the spring or fall, whereas, sodding can be done whenever the soil is not frozen. This typically means from March until December. There have been cases, in the Denver area, where sodding has been carried out a few days before Christmas.

One of the greatest advantages of sodding is that it eliminates the dust and dirt involved in the seeding process. In addition, sodding immediately adds the beauty of a completed lawn to your landscape.

Soil preparation, prior to sodding, presents fewer problems than preparing for seed. This is true because sod is made up of mature plants which are able to establish themselves under conditions somewhat less than ideal. When preparing the lawn for sodding, the soil should be finish graded and 20 to 40 pounds of a balanced fertilizer, 10-8-4 for example, incorporated into each thousand square feet. This heavy application of fertilizer encourages the turf to root down into the underlying soil. Unless organic matter is already present in high percentage, well-rotted manure, peat or compost should be applied at the rate of 2 or 3 cubic yards per 1,000 square feet and worked deeply into the soil.

The homeowner has the choice of hiring a landscape contractor to do the laying of the sod or, if he so desires, of doing it himself. If he decides to do the work himself he may find it to his advantage to lay only a small portion of the lawn at any one time.

Planting the sod is probably the simplest of all the operations in making a new lawn. Start laying the sod by butting the ends and sides up evenly. Overlapping of the sod will create an uneven lawn. Immediately after the sod is laid, go over it with a light roller. Follow this with a good watering, making certain the sod is wet clear through. Watch the new sod closely and when it starts to dry out give it another soaking. Watering once a week after the sod has knitted to the soil will usually be sufficient.

The success or failure of a lawn will depend, for the most part, on the amount of effort the owner expends on its maintenance. The amount of care given will depend upon the use to be made of the area and the appearance desired.

Generally speaking, newly established lawns should be mowed as soon as there is anything to mow. Mow often and regularly, clipping Kentucky bluegrass to a 2 inch height and Merion bluegrass to 1½ inches. Lawns should be fertilized as needed during the growing season. Additional applications should be made at six week intervals throughout the growing season.

If care is exercised in the selection of sod and proper maintenance techniques are followed, the homeowner will be rewarded with a fine lawn which will add immeasurably to his home landscape.

Several years ago we moved to Indian Hills. Here, 25 miles west of Denver and 2000 feet higher, we have adapted our gardening methods to those that will succeed in the pine zone. Extreme winter temperatures generally are comparable to those of Denver, but dry winds and brilliant sunlight quickly damage or kill unadapted or newly established plants, especially shrubs. On the favorable side, average precipitation is greater than in Denver, the ground remains frozen and snow stays on north and east slopes throughout the winter.

In winter these flat rocks serve as a bird feeding station. A small pine, yucca, sagebrush and creeping juniper are part of the planting.
The frost-free period is only 2½ to 3 months but many native flowers flourish in the invigorating coolness of summer. Mid-April sees our hills ablaze with pasque flowers. The first cycle ends in July with sego lilies and Indian paintbrush. Two months later the fall cycle brings on asters and other late flowers.

We have avoided a large lawn because of the amount of water and care it demands. As a substitute, we have utilized generous amounts of stone in retaining walls, terraces, rock gardens and rock fields on slopes and under trees. Areas denuded during construction which are quickly invaded by weeds and parking and service areas were also covered with rock.

Large rocks shelter plants in winter, accumulate snow and remain warmer than the frozen soil. In summer the soil is cooler under rocks and moisture is conserved. Rocks also hold back competition from the crowding native sod and can be arranged to control runoff. The ground under large pines is usually bare due to the interception of rain and snow by the trees. Here rock fields will allow the planting of a few drought resistant and shade tolerant plants.

All this suggests that special attention be given native plants. But we have also experimented with introduced species, at the expense of some water and additional care.

The native shrubs we like best are the common (Rocky Mountain) juniper, yucca and big sagebrush, along with kinnikinnick (bearberry) and creeping mahonia for ground cover and walls. Shrubby (bush) cinquefoil, boulder raspberry, ninebark and serviceberry can be transplanted if young. Mountain-mahogany and Fendler ceanothus are easy to propagate from collected seed. These and other native shrubs are listed by nurseries and some may be grown from hardwood cuttings treated with rooting hormones. Chokecherry, snowberry and wild roses should be kept away from the garden. They are aggressive and very difficult to control.

Many introduced ornamental shrubs are subject to winter and drought damage and defoliation by hoppers. However, we have a very successful terrace planting, now four years old, on the east side of the house, sheltered from wind and sun and protected by snow, which includes Oregongrape, spreading yew, rock and cranberry cotoneaster, Cornus euramom and the "fern leaf" euonymus — probably a variety of E. nana. The junipers — pfitzer, creeping Andorra and tamarix are at home without protection. The shrubs that delight us most are two heath plants (Erica carnea var.) which are covered with rosy bells in April, often while snow is still on the ground. Other shrubs, such as lilacs and honeysuckles, are grown in the area in exposed situations.

Practically all of the native perennial herbs, with a few exceptions, such as the Indian paintbrushes, can be transplanted to desired locations. Some tap-rooted species, such as purple loco, should be dug so the root is preserved or they may be grown from collected seed. Natives should be transplanted with regard to site — from a shady spot to a shady spot or from moist area to moist area. Among those easy to transplant are the asters, fleabanes, columbine, erigonomon, sego lilies, alliums and many more. Monarda and the late blooming, bright blue Penstemon alpinus help bridge the gap in the flowering season.

Several other western plants, not native to our area, supply bright color during the off-season. The poppy mallow (Callirhoe involucrata) comes from the Great Plains. Its decumbent stems spread widely and are covered with wine-red flowers from late July until hard frosts. The firealoe (Zauschneria californica and Z. garrettii) also blooms late with a profusion of orange-red trumpets which attract humming birds. Its native home is the Great Basin. Perseemon pinifolius, with red flowers on 10-inch stems above heath-like leaves, is a late bloomer. It has been reported from Mexico. Sensitive briar (Sauranka nuttallii), usually offered as Moronia uncinata, from eastern Colorado, blooms here in July. Its bipinnate leaves, sensitive to touch and fluffy balls of pink flowers give the impression of a small mimosa. All of these are hardy, prefer sunny slopes and are offered in catalogs.

Most of the introduced hardy perennials are at home here but, with few exceptions, require extra water and care. The pink, hardy candytuft and rock soapworth (Saponaria ocymoides) flourish with no more care than the natives. The rock plants revel in the cool climate and the tufted pansies put on a season-long show. Maiden pink self-sows and the thousands of seedlings are a problem. We have a very showy planting of Siberian iris, lythrum, monkshood, Helianthus variety Copper Spray and the salmon and red monarda on one corner of the leaching field where the roots find sub-surface moisture.

All of the hardy bulbs thrive in this climate. Tulips and narcissus do well among rocks under pines where shade is moderate and where there is usually enough moisture in spring for growth and blooming. The species tulips (Tulipa turkestanica, T. eichleri, T. In floia and T. fosteriana) have done well and appear completely in place in the rock garden.

Then, for something unusual, perhaps in the wild landscape rather than the rock garden, native grasses are worth some experimenting. We have used Festuca arizonica and Andropogon scoparius in strategic places and intend to try others.

Our experience indicates that successful gardening in the mountains requires empathy for the site and delight in all the things that grow.

**Heigh Ho! Plan for the Plant Sale in May!**

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Plant PATENTS
and PATENTED Plants

A. C. HILDRETH

Our Patent System

Our basic authority for patents is written in the constitution. Article 1, section 8, empowers Congress "to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries."

Congress, in 1790, enacted the first patent law. Since then, it has been possible to patent all manner of inanimate things including, in the words of the Patent Office, "practically everything which is made by man and the processes for making them."

A patent is a grant to an inventor of "the right to exclude others from making, using and selling" his invention for a period of 17 years. This period in which the patent holder can exploit his invention without competition is a reward for his creative effort and an incentive for further discoveries.

Plant Patents

Patents on living things were first authorized by Congress in 1930, when it passed the Townsend-Purnell Plant Patent Act, as an amendment to the general patent law. The Plant Patent Act was amended by Congress in 1954. These two Congressional Acts constitute our plant patent laws.

A plant is a living thing which obviously cannot be "made." Therefore, the wording of the ordinary industrial patent, which grants the right to exclude others from "making, using and selling" could not be used for plant patents. Instead, a plant patent grants "the right to exclude others from asexually reproducing the plant or selling or using the plant so reproduced."

It is interesting to note that, so far as the Patent Office is concerned, the holder of a plant patent is an "inventor" and the plant itself is an "invention."

When the original Plant Patent Bill was before Congress it was emphasized that the purpose of plant patents was to afford agriculture, as far as practical, the same opportunity to participate in the patent system that industry had long enjoyed. Plant patents now provide incentive for achievement in horticulture and thus contribute to placing agriculture on a basis of economic equality with industry. Thus far, however, it has not been found practical to include all kinds of cultivated plants under the plant patent system.

Some people may be surprised to learn that horticulture and horticulture, including floriculture and nursery production, are considered by the Federal Government as agricultural activities. They are so considered not only by the Patent Office but also by the Internal Revenue Service and the Department of Agriculture. By extension, we may assume that the Federal Government regards all gardeners, florists and nurserymen as "farmers."

Gardeners and Patented Plants

To most gardeners, a patented plant means only a more expensive plant. A plant patent holder usually prices a patented plant higher than an unpatented one. Also, if other plant propagators contract with the patentee to propagate and sell his patented plants, a substantial royalty usually is involved, which of course adds to the price of the plants. A price advantage to the patentee is in keeping with the intent of the patent law and is regarded as ultimately of benefit to the public.

Some gardeners believe that a patented plant is a plant of superior merit. Although many patented plants have been outstanding, this is not necessarily so. The Patent Office does not function as a kind of super America Award Committee. A Government patent has never been an official endorsement of a product.

What can be Patented?

The law now provides that "Whoever invents or discovers and asexually reproduces any distinct and new variety of plant, including cultivated sports, mutants and hybrids and newly found seedlings, other than a tuber propagated plant or a plant found in an uncultivated state, may obtain a patent therefore . . ."

It will be noted that patents are granted only on those plants which are asexually propagated. This means, of course, plants that are increased by budding, grafting, dividing, layering, rooting cuttings, etc. Plants propagated by seed, such as ordinary field crops, annual flowers and annual vegetables, are not patentable.

The exclusion of tuber propagated plants applies specifically to the Irish potato and the Jerusalem artichoke. Both are reproduced by tubers, which are also the parts that are used for food, for which purposes these crops are ordinarily grown.

Obtaining a Plant Patent

Anyone desiring to apply for a plant patent may obtain the necessary information from the Patent Office, Washington 25, D. C. Briefly the application for a plant patent includes:

1. A written document petitioning the Commission of Patents for a plant patent, with full description of the plant and specifications or claims, showing ways in which it differs from all others of its kind; and the usual oath required of patent applicants, containing also a statement that the plant was asexually reproduced and, in case of a newly found plant, that it was found in a cultivated area.

2. A drawing of the plant, showing its distinctive characters. If color is an important distinguishing feature, a colored drawing or a color photograph must be included.

3. A filing fee of $30.00.

The application papers and the drawings must be filed in duplicate. The second copy is for the Agricultural Research Service of the Department of Agriculture, which agency makes an advisory report on the plant under consideration.

Incidentally, if one changes his mind about getting a plant patent and cancels his application, the filing fee is not returned.

On second thought, it would be simpler and probably more satisfactory all around to employ a Patent Attorney and let him deal with the Patent Office. A roster of attorneys authorized to practice before the Patent Office has been prepared. Its title is "Patent At-
Infringements

Infringement of a plant patent consists in an unauthorized person's asexually propagating, using or selling a patented plant. In such case the patent holder may bring suit in Federal Court. He may ask an injunction to stop the infringement and may also ask for damages. These are matters to be settled by the court, the infringing person and the patentee. The Patent Office takes no part in seeking out cases of infringement nor in bringing legal charges against the offender.

Infringement of plant patents is probably more common than infringement of ordinary patents. This is because many people forget which of their plants are patented and because certain plants are very easily propagated asexually. In fact, certain perennials asexually reproduce themselves so readily that to grow them is to reproduce them. One can imagine some interesting legal questions arising about patent infringement when patented varieties of strawberries, oriental poppies and fall asters are being grown.

Despite such dire possibilities, plant patents, during more than three decades of operation, have functioned more smoothly than many American horticulturists predicted.

To my knowledge, there has been little said or written about petunias, even though they are among the most popular of the outdoor bedding plants. Because of their versatility you will probably see them wherever flowers are planted.

The common usage of the word petunia can be traced back to about the year 1825. However, the varieties commonly used today were, for the most part, introduced within the past few years. Of late, plant hybridizers have given them so much attention that we may now enjoy a broad range of different colors, shapes and sizes.

Petunias thrive in both ordinary and rich soils and will bloom well when planted in soils too rich for other plants. Some of the varieties used for bedding even do well under conditions of poor soil and high moisture. They are sun-loving plants, but bloom fairly well in partial shade. However, if grown under...
Petunia culture is relatively simple and easy. The seeds may be sown directly in the field or in containers indoors. Direct sowing in the field is not advisable due to the small size of the seed which is estimated at about 280,000 seeds per ounce. For early and safe results it is suggested that the seed be planted indoors. It takes about 2½ months for petunia plants to reach a size sufficient to allow for outdoor planting. This means that in the Denver area it will usually be at least May 20th before outside planting can be undertaken. If planted out any earlier than this the young seedlings may require some protection. This can be accomplished by covering them lightly with newspaper. When planted with bare roots they should be covered for a few days, during the hours of brightest sunlight. This precaution will insure that the plants do not wilt excessively before the roots can get a good start. The seedlings may be uncovered during the night or on cloudy days.

There are several ways of starting petunia seeds indoors. (See “Starting Seeds Indoors,” Helen Marsh Zeiner, March, 1963, The Green Thumb.) The seed can be planted in any container that allows for bottom drainage and that is at least 2 inches deep. A light-textured soil mixture should be used. Such a mixture can be formulated by mixing one part soil to one part peat and one part sand or vermiculite. If desired, the seed may be planted in a fine grade of pure vermiculite. The container should be filled to within one inch of the top with this soil mixture or vermiculite. The material is then tamped down and the seed is sparsely scattered on top. It is not necessary to cover the seed as watering will wash the seed into the soil mixture or vermiculite, whichever is used. After the seed is planted and watered, the containers should be kept at temperatures of 60 degrees F. Cover the seed containers with newspaper until germination occurs. After germination, remove the paper and give the seedlings light. Following germination the seedlings should be fed a solution of ¼ teaspoon of Hyponex, or some other approved liquid fertilizer, dissolved in one quart of water. After three or four days it is a good practice to move the seedlings into an area with cooler temperatures. Temperatures of approximately 50 degrees F. seem to be ideal and make for a finer, more compact plant which will not get too spindly.

In the winter it is easy to produce blooms under glass. The quickest results are obtained from cuttings taken from selected out-of-doors plants. These cuttings, which will give true-to-the-parent varieties, should be taken in September. Plants propagated in this manner should be grown at 50 degrees F. under adequate light. A word of caution, do not over-water, only water when the soil is getting dry. Watering may be required once a day or several times a day depending upon the existing conditions. Also, if the petunias are to be planted out-of-doors, be careful not to plant them where they will have wet feet, such as in areas of poor drainage or where the water will drain down a slope to them. It is better to keep petunias on the dry side rather than risk the chance of producing plants with yellow leaves — a common symptom of petunias grown in wet soil.

There are several classes of petunias from which to choose. For example, the large double flowering grandiflora, the large single grandiflora, or the single multilora with small, 2-inch flowers. A recent introduction is the carnation-flowered or double multilora petunia which is about the same size as the multilora but the flowers are double. Another of the newer series of petunias is the cascade grandifloras, which are useful in urns, baskets and planters. Their habit is to cascade in-shade conditions they do have a tendency to grow too rank.

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WINDBREAKS  
IN EASTERN COLORADO

Arthur E. Ferber

One of the outstanding assets that make Denver and its surrounding cities and communities so attractive and beautiful is the abundance of various trees and shrubs. Without them our fair city would look bare and forlorn.

Many of our rural cousins in eastern Colorado have taken or are taking steps to improve their surroundings. Numerous farmers and ranchers are planting farmstead windbreaks in ever-increasing numbers to protect their homes, yards, livestock and wildlife from cold wintry winds and drifting snow. They are planting narrow strips of trees to protect their crops and land from damaging winds and to hold snow on the fields.

With a nice tree windbreak as a background, many farm people are planting more lawns, flowers and ornamental trees and shrubs. With its contribution of form and color, as well as comfort, the windbreak can make a farm a home instead of a farmhouse — a home instead of just a place to live.

The climate in eastern Colorado is not favorable to lush tree growth. Dryland farms are the rule and windbreaks in most cases must live on the current year's precipitation. Many species have been planted and tested during the past decades but only a relatively few are able to endure the cold winters and in some cases, the hot, dry summers. The U. S. Horticultural Field Station, Cheyenne, Wyoming, the ARS Akron, Colorado Station, the Extension Service, the Fish and Game Department and, more recently, the Soil Conservation Service, have tested dozens of species of trees and shrubs in this area.

For dryland conditions the best spe-
cies are ponderosa pine, Rocky Mountain juniper, eastern red cedar, Siberian (Chinese) elm, honey locust, Russian olive, lilac and squawbush (Rhus triphloons). Several other fruit and berry producing species such as honeysuckle, western chokecherry and wild plum do fairly well on deep, loamy soils. The evergreen conifers are the best for sandy and clay soils and will live longer than the deciduous species in most locations. Besides, they furnish year-round protection.

Tree windbreak barriers in eastern Colorado should usually be located to the north and west of the farm home and yard area since most winter winds and storms come from that direction. Windbreaks may be from one to seven rows in width, depending upon the land available and the wishes of the owner. Tree rows should be spaced wide enough apart to permit timely cultivation for the life span of the plantation. This will usually range from 18' to 24' between rows. Tree and shrub spacing in the row, however, should be closer together to form an effective wind and snow barrier.

One of the principal problems associated with the establishment of conifers has been poor survival. This problem has now been solved. The Colorado State Nursery, Ft. Collins, is growing the principal conifers in small asphalt pots. Landowners can purchase them at a reasonable price and they are assured of 85% to 100% survival even under dryland conditions. The availability of these plants has provided a boost in improving the quality and quantity of windbreak plantings. One row of good evergreens is worth three or four rows of defoliated hardwood species in the winter time. They also live longer and are more pleasing esthetically.

To supplement mechanical cultivation for weed control there now are available several chemical pre-emergence sprays which, when applied, help control weeds in the row in newly planted windbreaks. In previous years these weeds were usually controlled by hand hoeing. It has also been found that these weeds in the row can be controlled mechanically through the use of a tine-like tool that is hooked onto the tractor tool bar and run over the individual rows. The steel finger-like tines comb the soil surface and destroy the tiny weeds but do not harm the tree seedlings.

Mechanical tree planters are also now available which replace the back-breaking job of planting the seedlings with a shovel. So, along with rapid mechanical strides in other phases of agriculture and forestry, the establishment and care of windbreaks has also advanced with the machine age.

The cost of establishing a typical farmstead windbreak varies from approximately $60 to $100 per acre, depending upon the proportion of potted conifers used. But many farmers and ranchers have stated that their mature windbreaks are worth from $2,000 to $5,000. Trees and shrubs are valued highly in these windbreaks and they have proven to be one of the best investments a plains farmer or rancher can make.

Trees and shrubs have uses in many places in rural areas. They have a place in odd areas for wildlife habitat, for streambank and gully erosion control, for recreational purposes and just to dress up the bleak landscape for esthetic values. It is difficult to evaluate their worth in dollars and cents but they are used extensively in the conservation of our land and wildlife and materially increase the comforts and well-being of rural people.
Geraniums from SEEDS

Don Cunnion for W. Atlee Burpee Co.

Like delightful flower surprises? Then you ought to grow geraniums from seed. You'll be richly rewarded with many interesting and beautiful shades among the plants produced from a single packet. Colors may range, for example, from white through pink and salmon to scarlet and deep crimson.

Geraniums are easy to raise from seed and you can have them in bloom most of the year — indoors and out. Plants flower 5 to 6 months after seeds germinate.

Here are some foolproof directions developed by W. A. Lee Burpee Co.:

1. Fill a shallow box, pot or seed-pan within an inch of the top with fine ly sifted soil. Add a half-inch layer of fine vermiculite and firm it smooth.

2. Mark rows ¼ inch deep and 2 inches apart.

3. Gently rub the husks from the seed in the palm of your hand, or soak the seed in warm water a couple of hours to speed germination.

4. Sow the seed thinly and pat in, just barely covering. Keep the vermiculite evenly moist and moderately warm for 6 to 8 weeks since some seedlings require that long to appear.

5. When one or more true sets of leaves develop, carefully move seedlings to individual 2-inch pots. Later, when they become potbound, move to 4-inch pots, where they can remain for 3 or 4 months.

Geraniums flower best when slightly potbound and kept on the dry side. Use low-nitrogen fertilizer for more bloom, less foliage.

African Violets

John S. Coryell

African violets are number one house plants today for two reasons: their almost infinite variations in color, size, and shape of leaf and flowers and the ease with which the parent plant may be reproduced from leaf cuttings. I intend to explain the growing of plants from African violet leaves.

African violet leaves will root and produce plantlets in water, sand, vermiculite, perlite, sphagnum moss, peat, or soil. The rooting medium may be any of these alone, or almost any combination of the above materials, plus others.

Basically, African violet leaves will root if you furnish them with water, oxygen, sunlight, normal temperature, and support. First, let's use water: Fill a glass tumbler, vase or bottle with water, cover with waxed paper held in place with a rubber band. Take a pencil, punch a hole in the waxed paper and insert the petiole (stem) of an African violet leaf so that the stem end is covered with water. Set in a warm, light window to await root development. Watch the water level and do not allow it to drop below the stem end (or ends). Roots should appear in a few days to a few weeks, depending upon the age, condition, and type of leaf. When the roots are about ½ inch long, transplant the leaf to a pot full of moist vermiculite or sand.

Many African violet growers claim only green, brown, or dark bottles should be used. Actually, anything that will hold water is suitable, and you must decide which you prefer by trying several. (Then other African violet growers go into rapture over their methods, which may be simple, or very, very complicated.)

I personally prefer vermiculite or perlite, and mixtures of these. Fill a 2", 2½", or 2½" pot with vermiculite and moisten. The size of pot depends upon your preference only, and your wish to keep varieties separate. Actually, a baking dish, whether round, square, or oblong, is very fine for rooting African violet leaves, especially if you wish to root several leaves at one time. Even plastic silverware "pans" or plastic bread boxes are excellent. Imagination knows no bounds.

After the pan or pots are filled, wet them thoroughly. If the pots have
drainage you cannot over-water. Pans with no drainage must be kept moist, but never have water more than barely showing on the bottom. Too much water drives out oxygen, and can kill roots in a very few days.

What type of leaves? How do you prepare them? The outside, fully developed leaves are usually too old and slow in rooting, with a death rate of 50% to 100%. The very center leaves are usually too small and tender. They CAN be used, but it is not recommended. The leaves between the center and the outside are excellent.

With the thumb and forefinger take hold of the petiole near the main stem. Move your hand sideways, with a slight pull, and the leaf and stem will come free. Then break off all except the two inches next to the leaf blade and the leaf is ready to put into the rooting medium. With a pencil punch a hole in the moist vermiculite, rotating the pencil to make a hole for the stem. Insert the stem and GENTLY push the vermiculite down around it to firm the stem in place. Place a label next to the leaf for support, with the variety name on it. Use one leaf per 2" pot, to several leaves in a 3" or larger pot. Space the stems far enough apart to give the leaf blades room for air circulation.

Humidity plays a big role in the rooting of African violet leaves. Individual pots or pans may be placed in plastic bags until rooted. When removing them from plastic bags, do it gradually. Remove for an hour or two, then two to four hours, then all night, then all day and night.

Light is necessary for all plants, and also for rooting leaves. Leaves for rooting do not need as much light as blooming plants, but they do need some light. Generally the more light the better the rooting and growth of new plants. One 40-watt fluorescent light hung 12 inches above a bench or table will light an area large enough to grow about 500 young plants from leaves, at one time. The problem is what to do with the 500 young plants!

Cleanliness is necessary to success in growing plantlets from African violet leaves. New pots and new vermiculite must be used, unless you sterilize everything before use. Organisms causing root-rot and damping-off are present all the time. Common sources of infection are tools or pots which previously contained infected leaves. Plastic pots and glasswares may be sterilized by soaking in a solution of Chlorox (1 cup to a gallon of water). Soak at least half an hour, and do not re-use solution too often, as the chlorine is used up.

Clay pots and vermiculite or sand may be boiled for 30 minutes, and are ready to use when cool. Formaldehyde is an excellent disinfectant but difficult to use anywhere except out-of-doors.

There are many ways to transplant plantlets. The following are the ones which I prefer: 1. Dig the rooted leaf and plantlets out of the pan with a spoon, or dump the pot gently. Pull off each plantlet large enough to handle and replant in a pan of vermiculite, 2"x2". Water carefully with a weak fertilizer solution (such as ¼ teaspoon Plant Marvel to 1 gallon of water) for three weeks, then transplant to pots and regular African violet soil. 2. Mix one part African violet soil to one part vermiculite, and transplant plantlets as soon as they are large enough to pull away from the mother leaf. Keep the freshly potted plants covered with a plastic cloth or out of drafts for a few days after transplanting. Water very carefully, and do not allow the plants to become too dry, nor to be kept too wet.
HERE ARE some tips for the proper care of cut flowers:

1. As soon as you arrive home with cut flowers, place their stem ends in deep warm water. Pour warm water into the container in which they will be arranged. Cut the stem ends diagonally with a sharp knife. Remove all foliage below the water level in the arrangement. Add a commercial flower preservative to the water.

2. Some cut flowers, such as euphorbias, have a milky substance or juice which should be sealed into the stem by quickly dipping the stem ends 1-2 inches into boiling water. The upper leaves and flowers should be protected from the steam with thicknesses of paper.

3. If stem ends get soft or decayed, recut the stems to remove that portion. Should any flowers look wilted, recut their stems and place them in very warm water.

4. Keep flower arrangements away from draughts, direct sunshine, and hot radiators. Resting them in a cool, dark place at night will refresh them and prolong their beauty.
Kathryn Kalmbach Herbarium:

A PROGRESS REPORT

HELEN MARSH ZEINER

READERS WHO have an interest in the Kathryn Kalmbach Herbarium will be pleased to know that the herbarium has recently acquired 3 new metal herbarium cases, bringing to 4 the number of metal cases in the herbarium. These cases are housed in the small herbarium room which opens off The Green Thumb office. They have made it possible to move a part of the general collection of Colorado plants from unsightly and unsafe wooden cases to permanent, good-looking and insect-proof cases. In time, we hope to have the entire collection in such cases.

The Herbarium Committee at present is working on the Mt. Goliath collection, mounting and preparing plants which were collected by Dr. E. H. Brunquist. This collection should be of value to anyone interested in alpine flora.

The next project of the committee is to begin a collection of cultivated plants which should be useful in identification for any gardener. If anyone would be interested in contributing plants for this collection, call the Herbarium Committee Chairman, Dr. Helen Zeiner, at 722-3655.

Botanic gardens has also recently acquired a stereoscopic microscope which will be very helpful in identifying plants for the herbarium collections.

APRIL HAS long been famous for its breathtaking display of blossoms on the early flowering shrubs, trees and bulbs. Remembrance of these flowering extravagances, in years past, should not lull one into a false feeling of security. Keep in mind the fact that, above all, April weather is unpredictable. Any plans for outside activities should be formulated with this in mind.

Of all the gardening activities for which April is suitable, tree and shrub planting is perhaps foremost. J. Sterling Morton, founder of The Morton Arboretum, Lisle, Illinois, must have recognized this when he brought about the establishment of the first Arbor Day on April 10, 1872. Arbor Day is on the third Friday in April in Colorado. This year it will be celebrated on the 19th.

When planting trees and shrubs it is necessary to follow certain fundamental rules. Most important of these is to select plants which have proven themselves hardy for our area. Any reputable local nursery or garden shop, many of which advertise in The Green Thumb, must have recognized this when they brought about the establishment of the first Arbor Day on April 10, 1872. Arbor Day is on the third Friday in April in Colorado. This year it will be celebrated on the 19th.
Thumb, will help you in selecting the right tree or shrub. Before purchasing nursery stock make certain that it is in good condition. Nursery plants that have dry roots or shriveled bark or balled and burlapped stock on which the ball of earth is soft or broken are not worth planting.

After selecting the proper tree or shrub, here are a few pointers to follow:

1. Make certain that the planting hole is large enough so that the roots are not crowded.
2. Check the drainage in the planting hole by filling it with water. If it takes several hours for the water to drain then the planting site should be changed or corrective measures taken.
3. No matter what type of soil is involved, its structure will be improved through the addition of organic matter such as peat moss or leaf mold. A good ratio is two parts soil to one part organic matter.
4. Following planting, watering should be thorough and regular. Dig around the base of the plant to check for moisture. If the soil in this area is dry, water is necessary. Supplemental watering is required for most all plants cultivated in our area and is extremely important during the time it takes the plant to become established.

Roses may also be planted at this time. The same basic technique described above may be used. Following planting they should be cut back severely to about 8 inches and the soil should be mounded up so that only the tops of the stems show. This soil should remain until new growth begins.

Perennials such as phlox, shasta daisies, painted daisies, chrysanthemums, fall asters and monarda may be planted or moved. Most perennials are moved with a ball of soil around the roots. They should be placed in adequate sized holes and carefully watered.

Hardy annuals such as larkspurs and asters can be seeded out-of-doors. Generally speaking, any of the annuals which naturally reproduce themselves from seed in this climate are hardy enough to plant out at this time. April weather is changeable and the less hardy annuals should not be planted out until the middle or latter part of May.

If not already done, dormant sprays may now be applied. Inspect your deciduous shrubs, particularly the cotoneasters and lilacs, for scale infestations. Junipers should be checked for aphids and elm and maple trees for scale. A little extra caution shown at this time may save you trouble in the months to come.

Most of the deciduous and evergreen species of trees may be pruned now if pruning has not already been done. The pruning of spring flowering shrubs should be postponed until after the blooming period to insure a maximum of flowers.

Those of you who are interested in obtaining plants for your home gardens should keep in mind the annual plant sale to be held on May 11th and 12th at the Denver Botanic Gardens, 909 York Street. Proceeds from this sale will go to the Botanic Gardens and its Children’s Garden Program.

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