

The Naming of Horticultural Plants

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Plants have names for the same reason that persons and objects are named, simply as a means of referring to them. Long before our present civilization came into being, people who lived in a particular area or region of the world had their own names for the plants they knew and used. The Aztecs, for instance, had medicinal uses for many of the plants in their area and they had their own names for them.

The naming of a few plants in a local region, however, is quite different from the situation which exists today when we are dealing with many thousands of plants on a world-wide basis. There are probably between 200,000 and 300,000 species of ferns and seed plants known today. These are contained within about 10,000 genera and 300 families. Of these 200,000 to 300,000 known species, about one-tenth or 20,000 to 30,000 species, are cultivated. I have not located exact figures but Hortus II, published in 1941, lists over 18,000 species cultivated in North America.

The naming of cultivated plants has been a problem for many years for those who sell, buy, and use them. I would like to touch on some of the problems involved in the nomenclature of plants (that is the system of names which is based on the botanical classification of plants), and how these problems are being solved by the application of two codes of nomenclature: the International Code of Botanical Nomenclature and the International Code of Nomenclature for Cultivated Plants.

Plants are not named haphazardly. For the past two hundred years the naming of plants has followed certain procedures. Carl Linnaeus, the Swedish botanist, in 1737 laid down the first of our modern rules of nomenclature and in 1753 he published his account of all the plants of the world known at that time. It was in this work, the Species Plantarum or the "Species of Plants," that he gave to all plants a combination of two names, which we call a binomial (the Latinized name of a species, composed of two words -- the generic name and the specific epithet -- Eucalyptus globulus). Before Linnaeus published this work the name of a plant might consist of one, two, or three or more words, which might be compared to using the definition of a word instead of the word itself. Linnaeus was a systematic organizer who could see the advantage of having uniformity in the naming of plants and soon other botanists began to follow his system of binomial nomenclature.

In the hundred years following Linnaeus, vast areas of the world were explored and colonized. Think of the exploration which went on

across our own continent from the end of the Revolutionary War until the Civil War. Wherever these exploring expeditions went there were usually plant collectors along, who sent back their plants to centers of research where they were looked over (sometimes too hastily!) and identified and named. With this activity all over the world, in discovering and naming old and new plants, there resulted a considerable amount of confusion; some plants had more than one name and so would be known in one country by one name and in another country by another name. It soon became obvious to botanists that there ought to be set up a system of rules of nomenclature which would be international, thereby providing a basis for all botanists to follow.

In 1867 the First International Botanical Congress was held in Paris. At this meeting there was presented for discussion a set of rules for botanical nomenclature written by a Swiss botanist, Alphonse de Candolle. From the time of this Congress until the Fifth International Botanical Congress in 1930 at Cambridge, England, there were certain disagreements among botanists regarding these rules. However, at the Congress in 1930 many of these differences became reconciled and for the first time the rules of botanical nomenclature became truly international.

The International Code of Botanical Nomenclature states the principles for naming plants and the specific rules for carrying these out. It deals with the categories of plant classification and the names assigned to these categories.

There has been worked out a system of classification by which those plants whose similarities are greater than their differences are brought together into taxonomic groups. These similarities are a combination of some of the characters of the flower and its various parts, the fruit and its seeds, leaf structures and the arrangement of the leaves, and the habit of the plant. Every plant belongs to several taxonomic groups which form a series with a fixed, hierarchical sequence. These are family, genus, species, botanical variety.

Family. This is an assemblage of smaller groups called genera which resemble each other in general appearance and technical characters. Some well-known families are the Rosaceae, the Rose Family; the Liliaceae, the Lily Family; the Leguminosae, the Pea Family; the Myrtaceae, the Myrtle Family; and the Ranunculaceae, the Buttercup Family. Most names of families end in aceae, with a few exceptions, of which Leguminosae is one.

Genus. This is a group subordinate to the family and often recognized from other genera in the same family by one or more characters. Eucalyptus and Leptospermum are genera of the Myrtaceae. Each genus consists of one or more species.

Species. This is a kind of plant distinct from other kinds in marked or essential features which provide good characters for its identification, and which may be assumed to represent in nature a

continuing succession of individuals from generation to generation, and which ranges over a certain geographical area. The name of a species was referred to earlier as a combination of two words, called a binomial, consisting of the generic name and the specific epithet, as Eucalyptus globulus or Leptospermum scoparium. It is important to realize that species are variable and that a species may be composed of subordinate groups, one of which is the following.

Botanical variety. Species may be composed of two or more variants which have originated and maintain themselves as natural populations in the wild and which generally have their own geographical distribution. For instance, Ceanothus papillosus consists of two varieties which may be distinguished from each other by the shape and size of the leaves. C. papillosus var. papillosus has leaves which are oblong-elliptical to elliptical, rounded to truncate at apex, 1/2 to 1 inch broad, while C. papillosus var. roweanus has narrow leaves which are linear to oblong, more or less retuse to truncate at apex, and less than 1/2 inch broad. When a species consists of two or more varieties the one which was recognized first and to which the specific epithet was first given is named by repeating the specific epithet and thereby using it also as the varietal epithet for that particular part of the species. Thus we have the above mentioned C. papillosus var. papillosus. When brought into cultivation a botanical variety is known by the same name given to it as a plant growing in the wild.

The International Code of Botanical Nomenclature deals with the botanical categories which have just been mentioned. Without going into the details of this Code, I would like to mention a few points of importance.

The principle of priority is the cornerstone of the Code. It provides that each group from family to species has only one correct name, the earliest one published within the same rank. Publication of names is governed by the Code; the place and scope of publication is covered in some detail. One condition of publication, observed since 1935, is a Latin diagnosis for each new species. Another very important rule is the homonym rule; a name cannot be used if it is a later homonym, that is, if it duplicates a name previously and validly published for another and different plant.

In cultivation there are two kinds of plants:

1. Those introduced directly from the wild, without any noticeable change in appearance or characters from those growing in their native habitat. Many of our ornamentals fall into this category, but others fall into the following one.

2. Those plants which are of horticultural origin. These have originated in cultivation and differ in various ways from their wild prototypes. We are always trying to find plants which are more suited to our needs and so through selection and hybridization many new plants with qualities superior for our uses than those of their wild progenitors have been developed by man. These cultivated plants are named at

three main levels: genus, species, and cultivar. We shall now answer the question of what is a cultivar, and at the same time consider the use of the second code of nomenclature mentioned above, the International Code of Nomenclature for Cultivated Plants.

Species, mentioned previously as often being variable, when brought into cultivation may produce seedling plants which differ among themselves. Some of these may have qualities such as flower color or habit of plant which are desirable for a particular purpose. A species with normally colored flowers may produce seedlings with white flowers, or a normally erect species may produce seedlings which are dwarf, prostrate, or fastigiate in habit. Such horticultural variants, which have arisen and are maintained in cultivation, have been called "varieties" but these variants differ from botanical varieties by reason of their origin and maintenance in cultivation and should not be confused with them. The term cultivar has been proposed as an international term for such variants and replaces the English language term of variety and also such terms as the Italian razza, Dutch ras, German Sorte, and Scandinavian sort. A cultivar may have originated as a selection from a single species or from a group of hybrids between two or more species. It may be a single plant or several plants seen first in cultivation and recognized by horticulturists, agriculturists, or foresters and which is distinguished by any characters (morphological, physiological, genetical, or chemical) that are different for the purposes of horticulture, agriculture, or forestry. It is a unit which is intentionally maintained as uniform as possible.

Because of the desirability of uniformity in horticultural material certain uniform groups of cultivars have been developed and are maintained by the particular mode of reproduction and propagation best suited to them. Two such groups are clones and lines. These two differ in their modes of reproduction and propagation.

Clone. A clone is a kind of cultivar. It is a collective name for all plants asexually reproduced (that is, by vegetative means, as, for instance, cuttings, divisions, grafts, or others), from a common ancestor. Plants which are members of a clone are all alike and identical with their common ancestor.

Line. A line is a kind of cultivar. It is a group of individuals of uniform appearance reproducing sexually, propagated by seeds, its stability maintained by selection to a standard.

Cultivar may be defined as a general term for an assemblage of individuals propagated either by seeds or some vegetative means and having one or more characters by which it can be differentiated from other cultivars within the same genus or species. The naming of cultivars is governed by the International Code of Nomenclature for Cultivated Plants. Let us now consider the relationship of this code to the International Code of Botanical Nomenclature and the difference in purpose of the two codes.

The International Code of Botanical Nomenclature governs the use of botanical names in Latin form for both cultivated and wild plants. The International Code of Nomenclature for Cultivated Plants aims to promote uniformity, accuracy, and fixity in the naming of cultivars, that is, for cultivated plants below the rank of species, and which are normally given fancy names. It does not regulate nor attempt to standardize common names. The two codes supplement each other. The International Code of Nomenclature for Cultivated Plants carries on for horticultural, agricultural, and silvicultural plants where the International Code of Botanical Nomenclature stops.

The International Code of Nomenclature for Cultivated Plants, after defining the term cultivar and naming kinds of units which the inclusive term cultivar may embrace, provides for the formation, use, publication, priority, and rejection of cultivar names. These may be summarized as follows:

1. New cultivar names published on or after January 1, 1959, are to be fancy names, that is, different from botanical names in Latin form. This does not affect the use of botanical epithets published previous to this date being used as cultivar names.

2. New cultivar names may be written in any language. The code provides for their translation and transliteration.

3. Cultivar names may follow either the botanical name or the common name of the plant.

4. Cultivar names should be written in such a way as to be distinguished from the plant names which they follow, either by use of different type face and preceding the cultivar name by the abbreviation cv., or by enclosing the cultivar name in single quotes. (Double quotation marks must not be used to distinguish cultivar names). Examples: Magnolia campbellii 'Strybing White'. Magnolia campbellii cv. Stark White. Rosa 'Peace'. Rose 'Peace'.

5. Cultivar names must not be repeated within a genus.

The Agricultural Code of California requires that wood ornamentals, except roses, whenever sold shall be labeled with the botanical name (Agricultural Code of California, Sect. 1148.2. See also Directory of Nurserymen and Others Licensed to Sell Nursery Stock in California and Summary of Laws and Regulations. As of September 30, 1960. State Publication No. 281, p. 237.) Because it is necessary to go to many different sources for the names of plants in the California nursery trade it was decided that Dr. Mildred Mathias and the present writer would collaborate in the preparation of a list of the woody ornamentals in the California nursery trade. These plants have come to California chiefly from those regions of the world having a Mediterranean climate, as California has, such as the Mediterranean region, certain parts of South Africa, South America, Australia, New Zealand, and in addition, from the milder parts of western Europe and eastern Asia. Thus, we are dealing with many plants from a large portion of the temperate regions of the world.

The sources of names for the list which Dr. Mathias and I have prepared were the printed or mimeographed price lists for wholesale nurseries. We divided California into two parts, (1) southern, and (2) northern and central. Dr. Mathias took the southern part and I took the remainder. We each made a card file of the items in our respective areas. There are enough differences in materials used in these two regions so that each of us had a considerable number of items not in the other's region. We listed both botanical and common names and when our two regional lists were put together we had about 6,000 items. Each item is cross-filed, common names to botanical names, and synonyms to the botanical names which we have chosen to use, and under our chosen botanical names are given the common names and synonyms. The list is alphabetical in one sequence and does not include several specialty items, such as ferns, bamboos, roses, fuchsias, rhododendrons, and camellias.

The sources for checking and verifying these names are considerable and too numerous to mention here, except for the following: Index Kewensis, Index Londonensis, Bibliography of Cultivated Trees and Shrubs and Manual of Cultivated Trees and Shrubs by Alfred Rehder, Hortus Second, Manual of Cultivated Plants, and Standard Cyclopaedia of Horticulture by L. H. Bailey, Trees and Shrubs Hardy in the British Isles by W. J. Bean, Handbook der Laubgehölze by Gerd Krussmann, Nederlandse Dendrologie by B. K. Boom, The Royal Horticultural Society Dictionary of Gardening edited by Fred J. Chittenden, The Royal Horticultural Society Supplement to the Dictionary of Gardening edited by Patrick M. Syngé, and the following periodicals: Curtiss Botanical Magazine, Edwards' Botanical Register, Revue Horticole, Baileya, Journal of the Arnold Arboretum, Gentes Herbarum, Gardener's Chronicle, Journal of the Royal Horticultural Society, and the National Horticultural Magazine. Regional floras of various parts of the world were used and also those works dealing with particular genera.

The plant names in the proposed list are written in accordance with the two codes of nomenclature just discussed.

It is hoped that the list will do the following:

1. Serve as a guide in labeling nursery stock.
2. Eliminate mislabeling.
3. Aid the customer in knowing what he is buying.
4. Promote uniformity in the names of ornamentals in the nursery trade.

It is expected that after the list is published problems will arise, since the list is only a guide to labeling of plants in the trade. In questions of doubt, the authors should be consulted for their interpretations of special problems.

MODERATOR SPRING: Thank you, Dr. McClintock. To present the first part of the next section - on the Selection and Production of Nursery

Stock, Mr. Van Rensselaer invited Mr. Fred Petersen, who is with the Soil and Plant Laboratory, Inc. of Orange, California, to present a talk on the methods used in producing standardized quality nursery stock and procedures, with the various methods at our disposal now, to keep these registered and certified clonal selections healthy and disease-free for our customers.

I would like to introduce to you Mr. Fred Petersen, who is a graduate from the University of Utah, having specialized in plant physiology, chemistry, and experimental biology. He has been with the Soil and Plant Laboratory since 1958. When recently it was decided to open a Central California office, Mr. Petersen was selected as the man to manage that office. I now call on Mr. Fred Petersen.

Current Methods in the Selection and Production of Nursery Stock

Fred H. Petersen

Central California Office
Soil and Plant Laboratory, Inc.

Without prescribed systemetized methods, the production of any item of commerce, be it an intercontinental ballistic missile or Juniper Tam, could be a chaotic unpredictable, uneconomic and unrewarding procedure. The pressing need of a guide for the systematic production of nursery stock was seen several years ago by Dr. Kenneth F. Baker in the Department of Plant Pathology at the University of California in Los Angeles. The outgrowth of this awareness was the UC Manual 23, The UC System for Producing Healthy Container Grown Plants. This Manual, edited by Dr. Baker, provides practical guides and a realistic basic philosophy upon which many present-day successes in the California Nursery Industry are based. The authors, both explicitly and implicitly, convey the thought that systemetized growing and the adoption of standardized methods and procedures can lead to the production of nursery stock with a higher degree of standardization than some thought ever possible. The successes of the system in the production of standardized plant material are largely the result of the fact that plant material grown under this system is provided with as near optimal conditions for growth and development as are possible. These conditions primarily depend upon freedom from plant disease caused by pathogenic fungi, nematodes and/or chemical damage.

The philosophy and methods suggested by our Organization are founded in the UC System. In extending this system into the nursery industry, our Organization would make the following suggestions as far as methods and procedures are concerned, particularly as they affect the propagation aspect within the industry. If we acknowledge that systemetized growing is pre-requisite to success, we must accept principles and follow plans. The procedures in propagation and production within the nursery should be detailed in writing by highly trained personnel, particularly in view of the fact that many simple procedures can be carried out by inexpensive and not highly skilled labor. These