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A Clone By Any Other Name... Is Not A Clone By Henry Ross

Hardly anyone understands the origin of the term "cultivar" or its complete definition. Most people, including eminent horticulturists, botanists and educators, believe that a cultivar and a clone are the same thing. Their knowledge of these terms is limited to this misconception.

A cultivar is a clone only in some cases. In others, a cultivar is not a clone. As presently used, the term cultivar actually has a double meaning. Thus, the belief that a cultivar and a clone are always the same thing is only half the story. Unfortunately, few people are aware of the other half.

Many gardeners have learned the hard way that two plants can be the same cultivar without being identical, or clones. This is the key to understanding when a cultivar is not a clone.

Maybe you have experienced an incident similar to the following.

In visiting somebody else's garden or nursery, you greatly admire a magnificent lily that is 6 feet tall with a dozen very large trumpet flowers in a gorgeous shade of orange. You are told the lily is African Queen.

You rush home, dig out the catalog of a lily specialist and order several bulbs of African Queen. But when the plants bloom, each is entirely different from the others. And not one is like the lily you first admired. One bulb produces an 18-inch-tall plant with only two flowers, each 3 inches long. Another produces a plant 8 feet tall with deformed flowers of a dirty brownish orange, while another is just a so-so plant of no particular merit.

What you have discovered is that African Queen is a cultivar name applied to any lily with trumpet-shaped flowers in any shade of orange that resulted from a cross of two particular species. These lilies can all be different heights, sizes, shapes, shades and so on. But they are all African Queen lily.

Many nurserymen have ordered a certain cultivar from several different sources only to discover that each source is providing plants that are entirely different from the others. But the plants are all the same cultivar, with common parentage but as little as one common characteristic, such as pink flowers or reddish leaves.

A cultivar, by today's definition, is a group of plants that display as little as one common characteristic. Everything else about them can be different, but they are still one cultivar.

A clone, on the other hand, consists of plants that are absolutely identical in all respects-identical both to their common parent and to each other.

Until about four years ago, I shared the common belief that cultivar and clone meant the same thing. However, I then discovered a discrepancy that suggested this might not be the case. I began researching the matter.

I wrote to many prominent horticulturalists and botanists worldwide in an attempt to dig out the facts. In every case, their only response was "a cultivar and clone are the same thing," and they referred me to the International Code of Nomenclature of Cultivated Plants, 1969, as the authority.

(Incidentally, I learned that the term cultivar did not originate from this 1969 reference. L. H. Bailey first coined the term in the early 1920s. However, tracking further documentation was difficult. Then it occurred to me to contact the L. H. Bailey Hortorium in Ithaca, NY. I am grateful to librarian Luella M. Sullivan for searching the files and sending me a photocopy of the original document: *Gentes Herbarium Volume I, Fascicle III, 1923*. I got the impression that even the library had not known of this document's existence or importance. None of the references I researched credits Bailey for coining the term cultivar.)

Other references have pointed out flaws in the 1969 code. In *The New York Botanical Garden Illustrated Encyclopedia of Horticulture, 1982*, Thomas H. Everett states, "Correct understanding and application of the terms variety (or more properly, *varietas*) and cultivar as spelled out in the rules of the

International Code calls for more technical knowledge about horticultural and botanical nomenclature than the majority of gardeners possess, and misapplications lead to confusion.”

(Everett, in my opinion, was the most knowledgeable horticultural writer in this country.)

Hortus Third defines clone as “a horticultural rather than a taxonomic term.” By taxonomic, the authors mean botanical. This may well explain why botanists loathe using the term clone.

The volume of *Gentes Herbarum* cited above first lists the term cultivar at the bottom of page 113. Nowhere in this document does Bailey mention clone, which I suspect was because the term was either unknown or at least not understood at that time.

A careful review of this extremely complicated document revealed that Bailey refers to cultivars as “groups or races of plants” that had originated and persisted under cultivation and did not exist in the wild. These groups are obviously not clones as he never suggested that these plants were identical in all respects.

For example, he listed *Tulipa gesneriana* variety Darwinia as a cultivar. He described the Darwin tulips as “a tall and late-blooming race with large leaves, flowers usually self-colored (parti-colored in the Rembrandt strains), in deep red, crimson and purple, the perianth little spreading, usually remaining cut-shaped and deep.”

Bailey obviously applies the “cultivar” name Darwinia to a group of plants that are all different from one another except for the common characteristics he lists: tall, late-blooming, large leaves and so on.

The well-known and numerous Darwin clones are all within the one “cultivar,” Darwinia. How then, can people maintain that cultivars and clones mean the same thing?

In the interest of further exploring the differences between clone and cultivar, I have extracted and condensed portions from the very long and complicated International Code of Nomenclature. These extracts are printed in italic type. My comments accompany each extract, printed in Roman type both within the extracts and following them.

- Preface, page 7. The concept of cultivar class is introduced to cover the taxonomic unit (a clone) or assemblage of taxonomic units (a group of similar but not identical clones) within which cultivar, [or] variety, names may not be duplicated.

- Article 10, page 12. The international term cultivar denotes an assemblage of cultivated plants, which is clearly distinguished by any characters...morphological, physiological, cytological, chemical or others...and which, when reproduced...sexually or asexually...retains its distinguishing characters.

This statement does not say that the plants must be identical in all respects. It merely states that the plants must have at least one thing in common, such as parentage, flower color, or anything else one may choose to base the cultivar name on. Clearly this applies to a group of similar plants – not a group of individuals that are identical in all respects, or a clone.

- Article 10, Note 1. Mode of origin is irrelevant when considering whether two populations belong to the same or to different cultivars. Examples: Carnation ‘William Sim’ produces color mutants, which by further mutation and back mutation give rise to indistinguishable color variants of diverse origin. All indistinguishable color variants, irrespective of their origin, are treated as one cultivar.

The tobaccos described as MacNair 30 and N. C. 2326 constitute only one cultivar since, though they derived their resistance to *Phytophthora nicotianae* parasitica from different species, they cannot be distinguished by their present characters.

Obviously the above description of cultivars does not apply to clones, in which the individual plants are absolutely identical in all respects.

- Article 11, section a, page 13. Cultivars differ in their modes of reproduction. The following are categories that can be distinguished.

A cultivar consisting of one clone or several closely similar (but not identical) clones. A clone is a genetically uniform assemblage of individuals...which may be chimeral in nature...derived originally from a single individual by asexual propagation, for example by cuttings, divisions, grafts or obligate apomixis. Individuals propagated from a distinguishable bud-mutation form a cultivar (here again, they mean a clone) distinct from the parent plant. (If a plant within a clone group has a sport or mutation, then it is a different clone. The plant would still be the same “cultivar” under the code’s definition.)

This is the only point in the entire document in which the authors make a separate reference to the word clone. They make a fatal flaw, however, by never mentioning the term again. Throughout the rest

of the document, whenever they talk about a clone-in which the individuals are absolutely identical with one another-they call it a cultivar.

At the same time, they continue to refer to a group of plants that have one or more traits in common as a cultivar.

- Article 11, section c. A cultivar consisting of cross-fertilized individuals, which may show genetical differences but having one or more characters by which it can be differentiated from other cultivars (groups of similar but not identical plants). Example: Phlox Drummondii 'Sternenzauber', a mixture of different color forms all characterized by the same starlike shape of the corolla.

Note that the authors again say that a cultivar encompasses plants that may have genetic differences but share at least one common trait. For example, everything else about 'Sternenzauber' plants can be different, as long as they have starlike corollas.

- Article 12. The practice of designating a cultivar (a group of similar but not identical plants) as a strain or equivalent term is not adopted in this Code. Any such selection showing sufficient differences from the parent cultivar (obviously another clone) to render it worthy of a name is to be regarded as a distinct cultivar.

Obviously, somebody realized that the authors were creating total confusion in Article 11 by not differentiating between cultivars and clones. Apparently this person attempted to amend the section by adding the word "strain" for those cultivars that are not clones but was voted down, as indicated here. Had the authors adopted the word strain, there would have been a lot less confusion. What the authors really needed to do was separate the terms cultivar and clone.

- Article 26, page 16. When a species or interspecific hybrid includes many cultivars (referring to clones, in which all individuals are identical), assemblages of similar cultivars may be designated as groups. (By "assemblages of similar cultivars," they are obviously referring to collections of individuals with at least one similarity, not clones.) If used between the specific name and the cultivar, the name of the group is placed within parentheses.

Example: *Tulipa x gesneriana* (Darwin Group) 'Bartigon'.

This passage conflicts with Article 12, which specifically states that the authors would not adopt the term strain or any equivalent term for cultivars that are not clones. Isn't "group" an equivalent term? (Ironically, they picked Bailey's reference to *Tulipa x gesneriana* Darwinia.)

- Article 27, section a, page 17. A cultivar name (the authors could be referring to a clone or to a plant group with one or more similar traits) published on or after January 1, 1959, must...be a fancy cultivar name, that is one markedly different from a botanical name in Latin form.

Here is another point in which the authors could have eliminated confusion between cultivar and clone. They should have said that a clone must have a fancy English name, while a cultivar that is not a clone should have either a Latin name or be clearly designated as a strain or group. But the way the authors refer to cultivar in this passage, we don't know if they mean a group of similar plants or clones.

From the above, it is obvious that the code is a mass of confusion caused by the fact that the authors do not make any distinctions between cultivars and clones.

According to this code, then, nurserymen have no way of knowing if what they buy under a fancy name is in fact a clone or a mixed bag, as in the case of African Queen lily and countless other cultivar names.

For the sake of example, let us say that citrus is a cultivar name. Oranges, lemons, limes and grapefruits are various clones in the cultivar citrus. Under the code's provisions, however, you could not use the term orange, lemon, lime or grapefruit specifically. Rather, you would have to call them all citrus.

Obviously, using the clone name assures that you know what you will get instead of just ordering citrus.

It is absolutely imperative that the words clone and cultivar be separated and that some method be established for knowing exactly what you are buying, whether it be a cultivar with similar traits of a clone.

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