

A Cultivar Attribute Database Derived from Ira J. Condit (1955): “Fig Varieties: A Monograph”

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Abstract. During California’s broad experiment with fig cultivation, Ira J. Condit became known as the “High Priest of the Fig.” Herein is a large set of fig attributes deemed agriculturally important by Ira J. Condit in his 1955 monograph. The attributes are divided into five categories and distributed across 717 cultivars. All data and software source code have been made available publicly on Figshare.

Fig cultivars grown for fruit are selected primarily from *Ficus carica*, *Ficus palmata*, and *Ficus carica* × *F. palmata*. They are complicated botanically and agriculturally. To begin with, figs are not a true fruit, but instead are a syconium (Flaishman 2022). Second, they are neither monoecious nor dioecious, but rather in transition between the two (Marcotuli et al. 2020), generating a dozen or more sexual variants. Third, each cultivar exhibits various levels of parthenocarpy which can vary by climate (Jafari et al. 2022). Fourth, figs have been cultivated before antiquity (Homer BCE 700), and thus the individual labels of clones and offspring have changed numerous times, resulting in a maze of names and synonyms.

After serving three decades as the lead investigator in the University of California fig crop research program, Ira J. Condit published an extensive “annotated bibliography” of figs (Condit 1955). This publication was based in part on an unfinished manuscript by Gustav Eisen, who had previously published a synopsis of figs at the turn of the century (Eisen 1901). Condit’s level of effort is remarkable, covering more than 700 cultivars within his sphere of knowledge. Some of these include detailed personal descriptions, whereas others are from prior authors. The entries vary from one or two sentences to multi-paragraph discussions of known alternate names (true synonyms), similar cultivars, morphological descriptions, and crop suitability.

This study is a manual assimilation of cultivar attributes from Condit’s 1955 monograph (Condit 1955) into a relational table and resulting data products. The extractions include agriculturally important cultivar attributes, but exclude those used by Condit solely for his theory of fig morphology identification (Condit 1941). A guide to the assimilated data plus all data files and computer software source code

are available publicly at Figshare (Frost 2023). The acquired list of attributes (sans cultivars) will become the subject of quantitative trait loci (QTL) analysis of 16 *Ficus* spp. specimens currently being sequenced at the University of Arizona Genomics Institute in Tucson, AZ, USA.

Materials and Methods

Scope. Condit’s monograph (Condit 1955) is composed of standard front matter, figure plates, references, an index, 19 sections of fig cultivar descriptions, and a few intervening background discussions. The index is admirable, although some formal entries escaped inclusion. The data in this study are limited to the 19 sections of fig cultivar descriptions and only those attributes deemed agriculturally important by Condit.

Approach. The monograph PDF file (Condit 1955) was converted to a plain text file using Adobe Acrobat Pro® v. 2023 (Adobe, USA) Export option Text (Accessible). The contents of this file were trimmed to his 19 sections of fig descriptions. Each description contains morphological characteristics for at least one of the three possible crops: Spring (aka Breba or Profichi), Summer (aka Second Crop or Mammoni), and Winter (aka Mamme). Seasonal names were adopted here as a simplification for nonfig specialists. See Fig. 1 for an example fig entry.

A set of about 40 attribute markup fields were inserted above each fig description, creating a single data source file from which all assimilation would occur [Fig varieties monograph annotated traits.txt]. A computer program was written in Mathematica® v. 13 (Wolfram Research Inc., Champaign, IL, USA) to parse the data and export it to a normalized hash table with two-dimensional keys: one for cultivar name and the other for attribute name.

The number of attributes grew to 66 during the process of manual data entry. The number of cultivars also grew because names specified originally as synonyms were then revealed as separate cultivars in discussion sections. A series of computer programs were again written in Mathematica® to produce

various data products (discussed in next section). The normalized hash table was exported to a spreadsheet file [condit.figs.table.tsv] for portability.

Results

Summary

It appears Condit wished to create a complete compilation of fig cultivars over the course of written Western history. Thus, many entries are historical and the cultivars are no longer in circulation. It also appears that many entries are warnings of fair-, poor-, and mediocre-quality cultivars to be avoided. Details for those ratings were given in several instances.

The monograph also contains a deliberate bias toward cultivars suitable for agricultural production in California, USA. Notwithstanding, there are also mentions of suitability for use in the US South and “dooryard” (home) cultivation. Readers should be wary of Condit’s descriptions of taste, which were his perception of market value, which was in contradiction with some of his contemporaries. Last, the entries for color, length, and size attributes demonstrate a lack of regard for systematic measurement. Thus, the specification of attributes for fig is the virtue of his monograph. Four diagrams of summary statistics are presented in Fig. 2. Detailed statistics and data tables are available at Figshare (Frost 2023).

Attributes by category

Tree.

- Sex: Only the four main types were documented by Condit: Caprifig (n = 85), Smyrna (n = 123), San Pedro (n = 22), Common (n = 487).
- Alternate names: A total of 587 true synonyms were identified across 262 cultivars.
- Similar cultivars: A total of 203 similar cultivar relations were identified across 262 cultivars.
- Tree vigor, growth habit: Twenty-three categories across 178 cultivars were documented.

Crop: Winter, spring, and summer.

- Productivity: Forty-eight descriptors across 208 cultivars were documented.
- Quality: Fifty-eight descriptors across 270 cultivars were documented.
- Season of harvest: Thirty-one descriptors across 120 cultivars were documented.
- Crop use: Ten descriptors across 192 cultivars were documented.

Fruit flavor, texture: Winter, spring, and summer.

- Flavor: Sixty-nine descriptors in 10 categories across 216 cultivars were documented.

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Name possible synonyms, similar cultivars, and misnomers
Sultani (syns. Fayoumi, Ramadi, Barshoumi, Sidi Gaber, Hejazi). Described and figured by Badie and Ghamrawi (1931) as the most common and widely distributed variety of Egypt. The following all proved to be identical in the variety plot at Riverside: P.I. No. 80,299, introduced into California in 1929 from Palestine as Sultane; No. 81,678, from the Tarring Fig Garden, England, in 1929 as Madagascar; and No. 80,152, from Ariana, Tunisia, in 1929 as Bidh-el-Atrous. The fruits show characters very similar to those described for the Sultani of Egypt. Therefore, all of the above will be treated here as one and the same variety. Bidh-el-Atrous is treated by Guillochon (1913, 1927, 1929) as a small, violet fig, with green ribs. Madagascar is briefly described by Spence (1846) as a small, globular, green sort, with narrowly lobed leaves, found in a West Tarring orchard. J. L. (1890) stated that the name Madagascar, "evidently a misnomer," was attached to a very large fig, frequently met with at Lansing, England.

Observations

tree growth and vigor **cultivar ID**
 Trees in Egypt and in California are vigorous, producing two crops. Leaves large, commonly nonlobed. The following description is from fruits produced at Riverside since 1940, in comparison with the account by Badie and Ghamrawi.

fruit born on lignified wood **cultivar ID** **cultivar ID**
 Breba crop fair; figs above medium, pyriform; ribs prominent; eye large, scales pink; color green, flushed with chocolate brown; pulp coarse, strawberry in color; quality poor.

fruit born on new growth
 Second-crop figs above medium to large, pyriform; stalk variable, short and thick, or sometimes slender and up to 1 inch long; color attractive, brownish violet; meat unusually thin; pulp light strawberry, texture gelatinous; seeds small and inconspicuous. Quality poor in Riverside, much inclined to split at maturity. Season late.

Fig. 1. Anatomy of a cultivar entry in Ira J. Condit's 1955 monograph (Condit 1955).

- Pulp texture: Eleven descriptors across 44 cultivars were documented.
Physical characteristics of fruit: Winter, spring, and summer.
- Size: Twenty descriptors across 474 cultivars were documented.
- Shape: Eighty-one descriptors across 479 cultivars were documented.
- Skin color: One hundred ninety-one descriptors across 618 cultivars were documented.
- Striped: Four cultivars were documented.
- Pubescent: Eight cultivars were documented.
- Pulp color: Seventy-six descriptors across 540 cultivars were documented.
- Seeds: Thirty-two descriptors across 120 cultivars were documented.
- Male bloom: Five descriptors across seven cultivars.
- Male cavity: Four cultivars were documented.
Physical characteristics affecting crop: Winter, spring, and summer.
- Stalk: Forty-one descriptors across 288 cultivars were documented.
- Eye aperture: Five descriptors across 183 cultivars were documented.
- Skin checking: Two descriptors across 79 cultivars were documented.
- Meat bulk: Seven descriptors across 26 cultivars were documented.
- Splitting: Thirty instances across 27 cultivars were documented.
- Climate susceptibility: Thirty-five descriptors across 39 cultivars were documented.

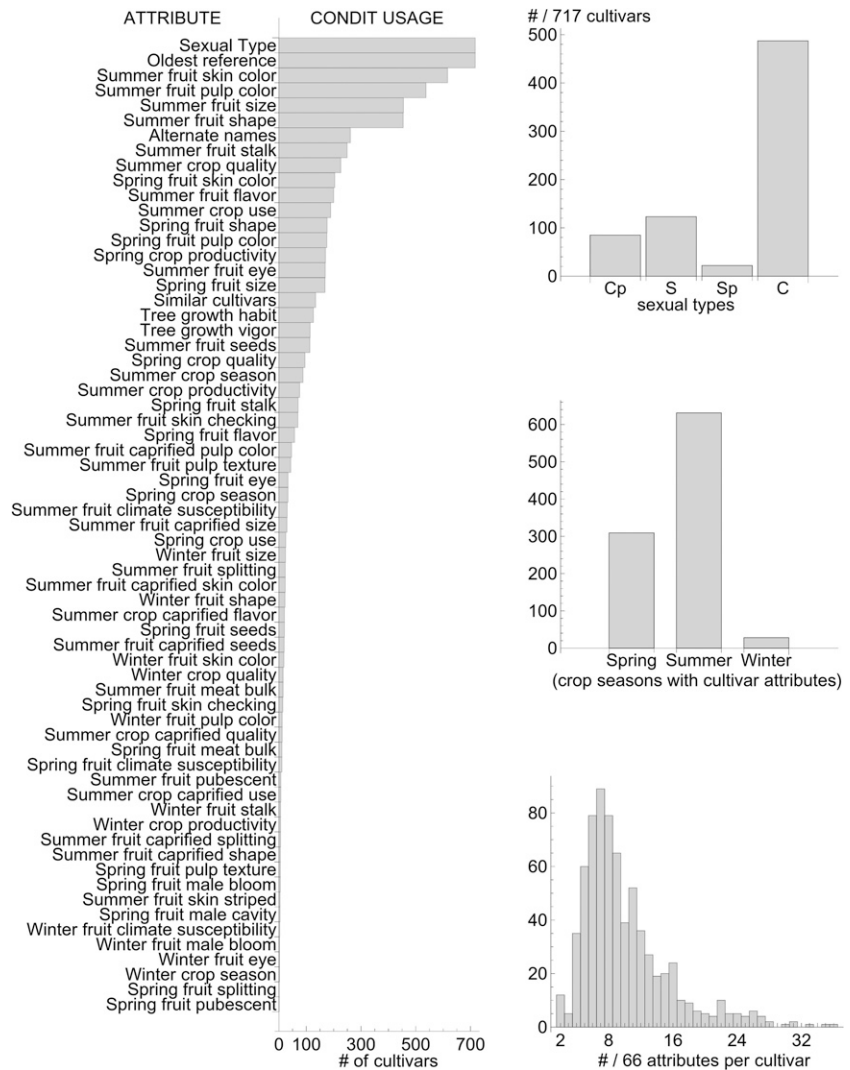


Fig. 2. Statistical summary of cultivar types, crop seasons, and attributes extracted for this study. Sexual types: C = Common; Cp = Caprifig; S = Smyrna; Sp = San Pedro.

Conclusion

Condit's monograph (Condit 1955) is a monumental testimony of his devotion to California's fig crop development program. After a thorough analysis of the content, the apparent focus was communication of good and poor attributes of individual figs, and primarily providing comparisons of figs for the purpose of identification. Furthermore, many of the attribute names assimilated here are distributed sparsely among the cultivars. This is presumably a result of Condit's focus on attributes he thought important for each specific fig, not for the entire set. It is also important to realize that many of the listed cultivars were not under his direct observation, but instead were located at distant sites or in historical references only. Going forward, the assimilated attribute names will likely be of use to researchers engaged in morphological

studies of *F. carica*. In addition, they will certainly provide a much broader set of QTL targets for those studying *F. carica* and *F. palmata* genomics.

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