

The Massed Glenn Dale Azaleas on Mt. Hamilton: A Valuable Collection at the National Arboretum

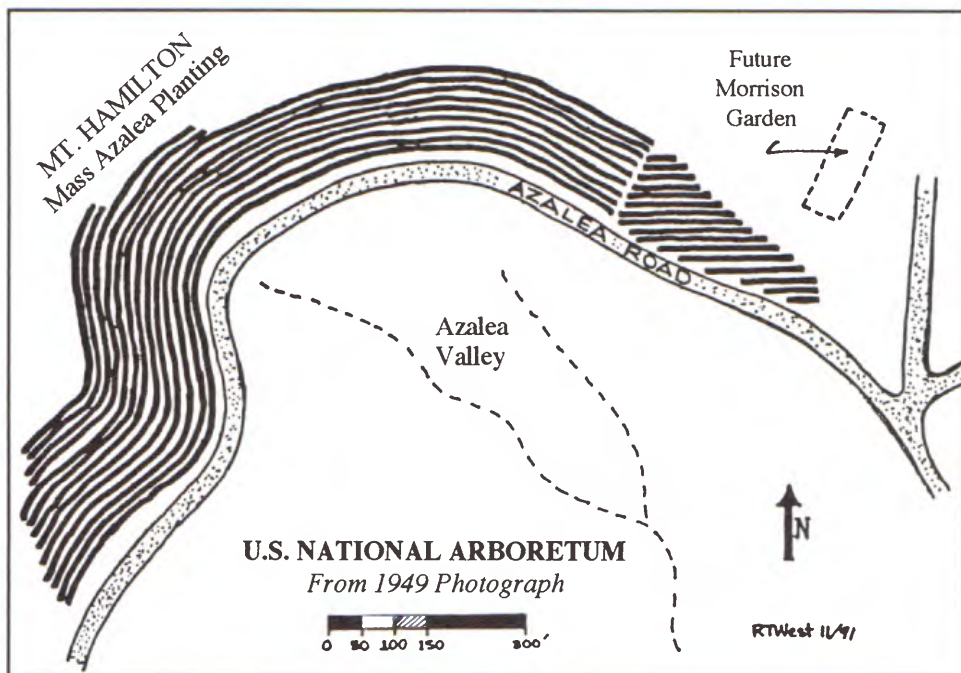
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"When in bloom, the azaleas attract as many as 60,000 people in a single weekend in late April." So said Henry M. Cathey, the fourth Director of the U.S. National Arboretum in Washington, D.C., to the attendees of the Tenth Azalea Society of America Convention in 1988 [1]. In particular, Dr. Cathey was referring to the massed planting of Glenn Dale hybrid azaleas on the south slope of Mt. Hamilton, the 225-foot high hill on the western side of the Arboretum. The planting, widely publicized and internationally known, is reported to contain between 60,000 and 75,000 unnamed Glenn Dale hybrid azaleas; that is, ones not selected for naming and introduction. To the visiting public it is an impressive sight of glorious spring color, but to the azalea enthusiast it is generally considered an anomaly, an unimportant group of castoffs hardly worth attention. Our research has discovered that it is, in fact, a highly valuable collection, which we believe contains a large number of the named and unnamed Glenn Dale hybrids selected from the thousands of seedlings produced and judged by B.Y. Morrison to be the very best of his extensive hybridizing program.

The popular stories we had heard in azalea circles over the years were to the effect that the Mt. Hamilton hillside planting was the result of some sort of helter-skelter operation where Glenn Dale culls or rejects were hurriedly planted at random in order to provide a quick display of progress for some undefined political purpose; presumably, to give justification to the Department of Agriculture's sup-

port of azalea hybridizing. A more graphic story told how the azaleas were thrown onto trucks at the Glenn Dale Station, driven to the Arboretum, and just tossed into holes in the ground. Even statements by knowledgeable experts that suggested things might be somewhat different didn't detract from the common beliefs: Frederic Lee in a 1968 article said, "The Mt. Hamilton hillside at the National Arboretum in Washington was planted years ago with probably over 70,000 azalea plants. While these include some of the 400-odd named Glenn Dales, they are in great part composed of plants that Morrison considered good enough for a large hillside display, but not good enough to be named and distributed as Glenn Dale hybrids" [2]. Thus, it seemed hardly worth any interest or effort to try and find a few named Glenn Dales among the thousands of other azaleas.

We held individually to these stories until our mutual interests in Morrison and his Glenn Dale azaleas brought us together in the spring of 1991 at the National Arboretum. Besides sharing our own variations of the hillside story, we also exchanged comments about things we had noticed or learned that didn't seem to fit what we had heard. For example, one has only to give more than a glance at the photograph of the hillside in bloom on the dust cover of Fred Galle's book, *Azaleas*, to see and realize there are azaleas in groups of color, rather than planted at random [3]. Walking the pathways around the hillside and looking at the planting shows not only the grouping, but what appears to be a very regular spacing between plants—a curious orderliness for what was supposed to be hurried and haphazard. It was also apparent that the massed planting, although covering a large area, did not hold 70,000 azaleas, but some amount considerably smaller. The discovery of some old photographs of the hillside and records about the Glenn Dales' history added to our increasing suspicion that the Mt. Hamilton massed azaleas represented some-



Sketch from 1949 aerial photograph of the National Arboretum

thing other than we had been led to believe and confirmed our shared feeling that the "something" was worth investigating and knowing.

Examination of the Hillside Planting

We began our investigation by trying to confirm our casual observations about the massed planting of azaleas on the southern slope of Mt. Hamilton, the hillside planting. One of us, Barbara Bullock, who is the Curator of Azaleas and Rhododendron at the National Arboretum (NA), found an old 1949 U.S. Navy aerial photograph of the NA. Taken in March when the trees were bare of leaves, the photograph clearly shows orderly rows running parallel to Azalea Road in a more-or-less east-to-west direction. The rows are arranged in two sections: the larger area is on the western side, from nine to about 13 rows deep, with a road frontage of about 1,200 feet; the smaller area, on the east, has some 16 rows of varying length with an overall road frontage of about 300 feet (see photocopy and sketch). A scale on the photograph allowed us to estimate that the hillside planting covered an area of about six acres or so.

With tape measures in hand, we inspected the planting closely, and found the rows to contain three plants across, spaced three feet apart each way. In general, the plants appeared to be grouped in blocks of twelve plants (3 x 4). With these measurements and the scaled photograph, we tried our hand at amateur aerial photo interpretation in order to estimate the total plants possible in the hillside planting. Taking into consideration linear bed length, rows in each bed, and distance between plants, we calculated that the total number of individual azaleas originally planted was about 15,000, a number much less than 70,000, but much more realistic. Dividing 15,000 by twelve (the assumed average number of plants in a grouping) gave us 1,250 groups of azaleas, or the approximate number of individual azalea varieties represented. The next questions were whether this number meant anything in the

Glenn Dale azalea program and what these 1,250 groups represented.

The Glenn Dale Hybrids and the Hillside Contents

B. Y. Morrison's interest in azaleas dated to the 1920s. In the mid-1920s, he began hybridizing by making crosses of azaleas at his home in Takoma Park, Maryland [4]. The first crosses involved 'Indica Alba', 'Indica Rosea', various Kurume azaleas, and *Rhododendron kaempferi*. In 1929, at about the time his first crosses came into bloom and he was beginning further crosses, Morrison's hybridizing interests became a "government project," probably in association with his responsibilities for the Plant Introduction Station at Glenn Dale, Maryland [5]. At Glenn Dale, Morrison had access to more kinds of azaleas either already there or purchasable, greenhouses and other facilities, and a lot of competent help. The result was hybridizing on a "serious scale" where all possible crosses could be tried. For example, a task assigned to Harry Gunning was to cross 'Vittata Fortunei' with everything [6].

As will be seen, how plants were identified at Glenn Dale was a key fact we needed to learn. Glenn Dale was also known as the "Bell Station," and the way of identifying plants, seedlings, or anything under study, was to assign a Bell or "B." number. Numbers were assigned in sequence, but the number itself was not important: the number referred to a card file where information about the plant was recorded, such as parentage, date hybridized or selected, etc. Bell numbers were assigned to the whole seedling population resulting from a cross (to record parentage, etc.), another new Bell number was assigned to a seedling selected from that cross (for origin, location, etc.), and another to a sport that might be selected from that previously selected seedling. Thus, a given azalea might have a history of two or three Bell numbers, the record file would relate the numbers, and sense could be made of it all.

A PI number is different: the assignment of a U.S.D.A. Plant Introduction (PI) number was part of the formal process where an azalea that was judged worthy was introduced or announced publicly. This was done by publishing its name, PI number, description, history, and other information, and otherwise making its availability known. The type of audit trail that is possible is shown by the Glenn Dale hybrid 'Cinderella' which is PI 201897 and B.43175. It was selected as a sport from B.32140 which came from seed lot B.13574 that resulted from the cross of 'Vittata Fortunei' by 'Louise' in 1929. The point is that Morrison and the others working on the Glenn Dales thought of the azaleas in terms of Bell numbers, not PI numbers or names, which did not come until the end of the process.

Bell numbers were assigned to the Glenn Dale hybrid seed populations resulting from crosses made in 1929,

Glenn Dale Hybridization Program Bell-Numbered Selections By Year

1937	B.27400-27500	101
1939	B.32134-32678	545
1940	B.35200-35360	161
	B.35373-35377	5
1941	B.36709-36724	18
	Pre-War Total	830
1946	B.39030-39057	
	B.39077-39079	
	B.39080-39104	
	B.39131-39136	62
1947	B.39448-39459	
	B.39470-39570	113
1948	B.40149	
	B.40150-40261	
	B.40302-40312	
	B.40379-40381	127
1949	B.40745-40749	5
1950	B.42495	1
1951	B.43173-43176	4
	Post-War Total	312
	Grand Total	1,142

1930 and 1932. The seedlings were grown one full year (including two winters) in a greenhouse and then planted outside in the "woods" area at the Glenn Dale Station where they were left to grow naturally as explained in Monograph 20 [5]. The total number of seedlings planted is not known, but it had to be in the many thousands.

In 1937, the first examination of the planted seedlings was made and an inventory of surviving plants was taken. Apparently, a large number had died, but many survived, numbering from as few as one to as many as 500 for various crosses. From these survivors, 101 selections were made, new Bell numbers in the B.27000 range assigned, and cuttings were taken for propagation to raise cultivars for further study and possible distribution. In 1939, the same plantings were inspected again, and 545 more selections were made and assigned new Bell numbers in the 32000 range. In 1940, the selections were 166 (Bells of 35000), and another 18 were selected in 1941 (Bells of 36000). Cuttings were taken as had been done previously. In total, we calculate 830 selections were made from the seedling-lot hybrids before World War II (see table of Bell-numbered selections by year).

What the exact procedures were in the propagation process and the further study of the selected cultivars isn't entirely clear. We think propagated selections may have been planted again at Glenn Dale in order to be further evaluated under natural conditions, at least in the beginning, and some small number of each selection apparently was planted also at Morrison's home in Takoma Park. It may be, however, that they were grown only in pots in cold frames at Glenn Dale. Whatever the case, enough had been learned about the first selections from 1937 and 1939, and apparently a few of the 1940 and 1941 selections had been sufficiently impressive from the initial inspection, that a total of 58 cultivars were named and given PI numbers in the summer of 1941. These included 12 from the B.27000 series, 27 from the B.32000 series, 14

from the B.35000 series, and five from the 1941 B.36000 series.

Propagation was underway for distribution, and the first plants may have been made available as early as 1940. We understand only a few were distributed initially, and they were probably the 12 from 1937 in the B.27000 series which included, for example, 'Dimity', 'Stardust', and 'Geisha' [7]. Documentation from 1942 shows there were only eleven early recipients: five nurseries, five botanical gardens and arboretums, and one individual, a Sidney Mitchell of Berkeley, California.

Interest in more Glenn Dale hybridizing had not ceased with the selections and the preparations for naming of the first hybrids. In late 1938 and early 1939, about 50 Satsuki azaleas arrived at Glenn Dale from the Chugai Nursery of Japan. Morrison used nine of them in crosses with other cultivars that had already been used as parents and with selected Glenn Dale hybrids to make 31 crosses in 1939, identified by B.33337 to B.33367 (referred to here as the B.33300 series) for the resulting seed lots (more on this later). Additionally, Morrison did some other crosses in 1940 and 1941, identified with B.36000 and B.38000 series numbers.

At the beginning of World War II in 1942, the greenhouses and coldframes at Glenn Dale held previously introduced Glenn Dales azaleas being raised for distribution, selected hybrids under further study, and the seedling results of the recent additional crosses. An order came to clear out everything, and to begin the immediate propagation of *Cinchona* tree seedlings to be used in the production of quinine needed for the war in the Pacific. Some of the azalea stock were sent out on the last distribution before stopping for the war (maybe plants for as many as 30 cultivars), and Morrison took some number of plants to Takoma Park. The majority, we believe, were sent to the NA, including the whole seedling population from the B.33300 series cross, according to Glenn Dale records.

Such a shipment to the NA had been planned for sometime, it seems, based on statements by Morrison [8]. In 1937, Morrison was appointed Acting Director of the NA following the death of Dr. Frederick V. Coville, the first Acting Director. Due to extremely limited resources, little had been done at the NA other than land acquisition, but a Civilian Conservation Corps (CCC) camp that came in that year began to do grading, general clean-up, and road construction. Although NA collection materials were non-existent, Morrison soon realized that in his position as head of the Division of Plant Exploration and Introduction, he could feed materials to the NA collection from Glenn Dale with ease and at no cost. Additionally, he firmly believed in the idea of permanent collections of exceptional material in arboretums for research and further development. He had already been thinking about sending the selected results of the Glenn Dale hybridizing to the NA, and the clearance necessitated by the war made it a reality.

The transferred azaleas may have been placed first in cold frames at the NA, but they were soon "lined out" in nursery beds, and they remained so planted for the War's duration. Morrison stated in Monograph 20, "Propagations [at Glenn Dale]...produced the thousands of plants that were sent to the National Arboretum for permanent display. The nursery there was exposed, with no tree cover" (p. 13). No list of the transfers has been found, but various sources indicate there were about a dozen of each hybrid azalea, with some having only ten and a few with as many as 50. The plants were identified by Bell number only. The azaleas at the NA and at Glenn Dale received only minimal attention, if any, for the duration of the war.

After the war, when the Glenn Dale hybridization program was resumed in 1946, initial selections were made again from those early seed lot plants still growing in the woods at Glenn Dale, the very same groups from which earlier selections had



Azaleas on Mt. Hamilton hillside just after planting, about 1948. Note grouping and spacing of plants.



Contemporary appearance of hillside azaleas and walkway on Mt. Hamilton.

been made. About 60 selections were made in 1946, and some 70 more were made in 1947.

At the NA, the first order of business was clearing and preparing a site on the southern flank of Mt. Hamilton for a large planting of azaleas. All of the plants that had come from Glenn Dale in 1942 had become much overcrowded in the nursery beds, and transplanting to a permanent location was an immediate necessity. About five acres were planted by the fall of 1946, with some additional acreage planted in the spring of 1947, after which the hillside planting was reported as "complete" [9].

During this transplanting, which we believe may have not yet involved any of the B.33300 series seedlings, a few selections were made, the first from material at the NA; some of these were 'Glacier' (B.32537) and 'Ambrosia' (B.32378). Also in 1947 the formal introduction of selected azaleas resumed: 143 were given PIs, the great majority of them being selections made before the war. Plants from the B.33300 crosses of 1939 did come under observation eventually, and, as a consequence, the Glenn Dale hybrids suddenly had new kinds of flower patterns.

The Bell 33337 - 33367 Crosses

As mentioned, Morrison undertook a series of 31 crosses in 1939 using as parents cultivars that had already

proven to be successful parents (e.g., 'Indica Alba'), certain quality Glenn Dale hybrids (e.g., 'Ivory'), and recently obtained Satsuki azaleas (e.g., 'Adzuma-no-hana'). The seedling lots resulting from these crosses were identified with the numbers Bell 33337 through Bell 33367. These were "sent to the NA in 1942 as whole populations;" that is, they were not planted anywhere else, either at Glenn Dale or Takoma Park.

In 1947 those 14 crosses that had a Satsuki azalea as one parent came under inspection. Forty selections were made, some of which had very unusual flowers, one of which was specifically noted in Monograph 20:

Although they are known to exist in various races and the writer [BYM] has one Japanese clone in which a dark stripe occurs on a colored ground, this pattern was not observed until 1947 when a clone that never before had shown any stripes gave a few flowers in which a rose-colored stripe appeared on the pale-pink ground. Several more appeared as bud sports, flowering in 1948 (p. 15-16).

The description for one of the 40 selections, B.39500, which was described as being Spinel Pink with a blotch and eventually named 'Alight' (PI 163942) stated, "Watch for special tag on branch which is rose striped on pink ground."

Although selected in 1947, the 40 cultivars chosen were not described until 1948, a fact which probably accounts for another statement in Monograph 20 about unique flowers:

Until 1948, no floral pattern appeared such as seen in the tender forcing azaleas; e.g., 'Vervaeana'; in which there is a narrow white border to a pink flower that may or may not be striped as well...

On a more limited number of clones there also appeared normally producing striped flowers, in addition to the type sport, in which the ground color is white with a colored border of varying width (p. 12).

The appearance of flowers with an edge or border of white to a colored flower (what was called a Vervaeana-style or V-type) and those with a white center and a colored margin or edge (a "bordered flower") was an exciting and notable event. Prior to their first being seen in 1947 and 1948, all Glenn Dale flowers had been white or solid colors, white with stripes, and a few having a flush or wash of color, such as 'Mother of Pearl'. Thus, the bordered and the V-type flowers were quite different and probably a welcomed surprise. Furthermore, such flowers got attention in Monograph 20:

Border patterns, curiously enough, do not seem to be so important if

the border is colored, because they are sufficiently unusual to command attention. When the border is white and the petal colored, the more sharply defined the white border, the more sparkling the effect, (p. 14).

Selected in 1947, the 1948 description for B.39513 stated, "3-inch flowers, white center, magenta margins." This selection was named 'Martha Hitchcock', and it was the first of the unique bordered and V-type flowers selected from the B.33300 series.

In 1948, the B.33300 series plants were inspected again, and this time 123 selections were made, including many bordered and V-types. In the two years, selections that resulted in Glenn Dale hybrids were made from 19 of the 31 seed lots. The number of selections per cross ranged from one to 27. In total, 161 selections were made that became named Glenn Dale hybrids. These selections constitute 35 percent, or about one-third, of the total Glenn Dale hybrid population. From these crosses came all but one (i.e., 'Bravura') of the bordered and V-type flowers in the Glenn Dales, from 'Susannah' to 'Surprise', numbering 27 cultivars.

The present location of the B.33300 series at the NA is a bit of a mystery. By 1947, the "large azalea planting" on Mt. Hamilton's south slope was reported as being completed. A 1948 selection list states the B.33300s are in the "Little Garden" at the NA, but the description of the planting—some 22 rows in a north-south orientation—doesn't match an obvious location on the 1949 aerial photograph. Dr. John Creech, who was at Glenn Dale in the late 1940s and later became the third Director of the NA, has told us that he remembers that the cultivars that gave the last selections of Glenn Dales (which was mostly the B.33300 series) were located on the eastern edge of the mass planting near the Morrison (Clonal) Garden. The photograph does show a section on the eastern side of the hillside planting where the rows are in a different orientation

from the rest of the planting, and we think this area is a probable place for the location of the B.33300 series plants.

One piece of evidence has been found that shows the B.33300 series was a part of the Bell-numbered hillside azalea plantings. A Mrs. Davies went through the azaleas in 1949 and gave a list "through channels" of cultivars she wanted. Her list, all in Bell numbers, included named and unnamed Glenn Dales selected before the War as well as one B.33300 series cultivar. In response to her request, Morrison expressed grave concern about digging up any of the NA permanent collection to provide her plants.

Conclusion

In addition to those selected at the NA in 1948, a few more selections were made at Glenn Dale in what was essentially the last year of selection activity. Final decisions were made on ten other selections in 1949 and 1951 ending that part of the program, and the final distribution of introduced Glenn Dales occurred in 1954.

Morrison had made the NA one of the recipients of Glenn Dales in the distribution program. We think some of the azaleas received through the distribution may have been planted eventually in and around the Morrison Clonal Garden. In a 1948 report to the NA Advisory Council, Morrison stated that any missing clones would be brought into the collection, but whether this included supplementing the hillside planting to assure a complete 1,142 Bell-numbered collection isn't yet known. How the plants were finally arranged on the hillside also isn't known. The existence of a planting diagram has been suggested, but nothing has been found. Dr. Creech thinks the first selected azaleas were placed at the top to the hill. Interestingly and unexpectedly, he also mentioned the existence and location of the "Sweet Pea collection," which were pastel-colored Glenn Dale hybrids selected for further study by Al-

bert Close, a propagator at Glenn Dale. This collection is located at the western, top edge of the hillside.

There is an additional, relevant item of information about the budget for the NA and the hillside planting. An important topic of discussion by the NA Advisory Council after the war was how to get an adequate budget appropriated from the Congress to enable the NA to do its work. The Council advised that public and Congressional support would not be forthcoming as long as the NA and its work remained unknown. Morrison was strongly encouraged to invite the public to the NA to see the good things being done there, and the massed azaleas on the hillside was the perfect example needed. Morrison had doubts about allowing the public into a research collection, but in 1949 the NA was opened for the first time to the public during the azalea bloom. Then as now, the public came in droves to see the azaleas, and they learned about the NA.

Our working hypothesis for further research on the hillside is that it contains virtually all of the named and unnamed azaleas selected from the tens of thousands of hybrids produced in the Glenn Dale program. We believe that virtually all of the 830 selections made before the war are represented, and we know that the unique B.33300 series was only at the NA [10]. These two groups constitute about 85 percent of the total number selected. We think also that it is reasonable that the hillside was supplemented to include missing cultivars. We are intrigued that our estimate of total plant groups on the hillside—approximately 1,250—is near the number of 1,142 Bell-numbered selections made in the program, even though it may be only a coincidence. The goal of further research would be successful identification of the hillside planting, and we are confident that, as a minimum, the B.33300 series with its unique flowers can be located. The odds of identifying others are good: the 454 named Glenn Dales in

Monograph 20 are 40 percent of the total Bell-numbered selections.

Thinking back over our investigations during the past months, we are reminded of the old parlor game where a story is whispered from one individual to another in a line, and everyone laughs at how much the story has changed by the time it gets to the last person. The story of the massed azaleas on Mt. Hamilton is much like that, it seems to us, because the truth has gotten mixed up and the story has changed. The hillside planting does contain only "unnamed" Glenn Dales because they were identified only by Bell number. Rather than rejects and culls, the azaleas "represent the cream of the hybrids that were produced" as stated by Morrison himself [11]. Whereas the total, initial seedling population may have numbered some 70,000 plants, the hillside contains a number close to 15,000. Instead of rushing a planting of azaleas for some political purpose, the azaleas were sent to the NA as part of a planned donation, albeit earlier than expected because of the war and perhaps done quickly because of the requirements of the time. Rather than being planted haphazardly and at random, the azaleas were planted in prepared rows, orderly arranged in groups of about 12 plants for each selection as an intended part of the permanent collection. Whatever political and budgetary issues prevailed at the time, they had nothing to do with the creation of the hillside azaleas display, but rather they were related to using the hillside as a way of gaining support for the NA as a whole.

The massed planting of Glenn Dale azalea hybrids on the south slope of Mt. Hamilton at the National Arboretum is an important collection. It is the only collection that contains a substantial proportion of the total select-

ed hybrid population. It is the only collection that contains the complete hybrid series that produced the bordered and V-type flowers. It is a unique germ-plasm collection for research and further development. The massed azaleas on Mt. Hamilton are the living history of the Glenn Dale azalea hybridizing program and the origins of the National Arboretum.

References and Comments

1. Cathey, Henry M. The United States National Arboretum. *THE AZALEAN*, September 1988, 10(3), 52-55.

2. Lee, Frederic P. B. Y. Morrison and his azaleas. Reprinted in *THE AZALEAN*, September 1988, 10(3), 60-62. Mr. Lee was Chairman of the Arboretum's Advisory Council after World War II and the author of *The Azalea Book*.

3. Galle, Fred C. *Azaleas*. Portland, OR: Timber Press, 1985.

4. Information about Morrison's early work is contained in a paper entitled, "Report of Azalea Breeding, July 1, 1928," found in Glenn Dale Station records by Bill Miller. This paper may have been used as part of the documentation when the Glenn Dale hybridizing program was being established.

5. See: Morrison, B. Y. *The Glenn Dale Azaleas*. U.S.D.A. Agriculture Monograph 20, October 1953, for a summary of crosses and the overall Government program. In Monograph 20, Glenn Dale is called the "Plant Introduction Garden." Morrison's position was Chief of the Plant Exploration and Introduction Division.

6. From a working paper found in the records at Glenn Dale. Copies of this paper and other Glenn Dale

records mentioned are in the possession of Bill Miller.

7. Personal correspondence from Frank Dowdle, a Glenn Dale employee, to Bill Miller.

8. Morrison explained his intent to the NA Advisory Council as recorded in the transcript of the May 1946 meeting on page 15, available at the NA.

9. NA Advisory Council minutes for 1947 and 1948.

10. The NA Advisory Council minutes of 1947 include a statement about "170 clones" being represented in the hillside, but this was apparently an interim accounting.

11. The Morrison quote comes from a letter he wrote to a reporter who had asked about the hillside azaleas in 1947. Bill Miller has a copy.

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