California Public Strawberry Breeders: A Perfect Marriage of Genetics and Culture

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Public breeding in California was begun in 1924 by the University of California (UC), Berkeley pathologists A.G. Plakidas, W.T. Howes, and W.T. Horne who embarked on a successful effort to identify virus tolerant material for breeding. Harold E. Thomas and Earl V. Goldsmith took over the UC strawberry work in 1929 at the Deciduous Research Station in San Jose in a fortuitous combinations of individual talents. As related by Wilhelm and Sagen (1974), "Thomas was the trained PhD scientist, but by fortunate coincidence, Earl V. Goldsmith, who was the foreman of the San Jose Station, was an inveterate strawberry enthusiast and a pioneer hybridizer, and a lifetime friendship developed between the two men—scientist and layman."

Goldsmith and Thomas began by screening a huge selection of strawberry cultivars, hybrids, and species from all over the world. Most notably, they evaluated 80 clones from the great private breeder Albert Etter, who had liberally used clones of *F. chiloensis* in his breeding program. This provided the wonderfully diverse, adapted germplasm base that is the foundation of the California program today. Etter must have seen something special in this team as Wilhelm and Sagen suggested that "although Etter cared little for men of science, men of science cared much for him."

Ultimately, the lions share of the work was transferred to the UC–Davis campus, after a couple of intermediate locations were tried where much material was lost to disease. Goldsmith was reassigned in 1934 as a full time breeder. He had begun by making crosses in his free time, but the breeding work simply became too consuming. Wilhelm and Sagen indicate that "Goldsmith had made his first strawberry crosses in 1929 on his own time, after his duties as foremen. When it became obvious that it was not practical to carry on his project in this way, he consented to have the University take over his work." Note the word "consented."

Two great releases came out of their program in 1945: 'Shasta' and 'Lassen'. 'Shasta' replaced 'Banner' and 'Nich Ohmer' in the central coast and dominated for another 30 years, while 'Lassen' took over southern California from 'Klondike' for 20 years. These two cultivars contributed greatly to all modern California strawberry cultivars, particularly 'Lassen', which has contributed about 25% of the genes in the current UC–Davis breeding program (Bringhurst et al., 1990).

Thomas left the University to direct the private Strawberry Institute of California in 1945, and took Goldsmith along as the strawberry breeder. The Wilder Silver Medal was later given to the California Experiment Station in 1954 for its strawberry breeding program, which of course, Goldsmith and Thomas had established. Ironically, the award was received by Warren P.

Tufts, the chair of the Pomology Department; no one informed Thomas and Goldsmith about the award (Wilhelm and Sagen, 1974).

Richard E. Baker took charge of the breeding program from 1945–1953, and was assisted by Victor Voth at Torrey Pines near San Diego (Fig. 1). Royce S. Bringhurst arrived in 1953 and took charge of the program (Fig. 2). He and Voth developed a model collaborative program, where the crosses were made at Davis and half of the resulting 8 to 15,000 seedlings were grown at Winters (near Davis) and the other half at Santa Ana or Torrey Pines. The Bringhurst–Voth team absolutely maximized the potential of each of their cultivars through a complete marriage of culture and genetics. Virtually all the modern production practices now used in California were developed by Victor and such things as plant spacing, hours of chilling before digging, planting date and fertilization were optimized for each cultivar (Voth and Bringhurst, 1990).

Fig. 1. Victor Voth.

Fig. 2. Royce Bringhurst.

I had the good fortune to be a graduate student of Royce in the mid-1970s when the first day-neutral selections were in the final testing stages. It was great fun to watch him operate in work and life. He was very firm in his beliefs and was not shy about sharing them with me (and others!). He had a tremendous work ethic, but always saved quality time for his family and church. My wife Ann and I spent many wonderful Christmas days at their house eating a fine meal with the family and hearing Royce

read *Gabriel Grubb* by Charles Dickens. I am told he was a robust tenor in many Gilbert and Sullivan productions.

Royce is one of the most creative and inventive people that I have ever met. He completely revolutionized the strawberry industry when he successfully transferred day-neutrality from a wild strawberry clone from the Wasatch Mountains into commercial cultivars. In his day-to-day life, he showed repeated flashes of brilliance. One of my favorite examples is how he got around the requirement of having the seat belt attached before starting his University car. He would open the door and instead of sitting down would lean over the seat and directly start the ignition. He had nullified the flashing warning light by placing a piece of paper over it. The warning buzzer was still a bit of an annoyance for his passengers, but by then Royce was deaf enough so that it didn't bother him at all.

I found Royce to be a patient, caring major professor who taught by example rather than by lecture, and gave me plenty of room to grow. He walked to the Genetics seminars with me, and personally picked me up at home to go to the field with him. He showed me how he set up field experiments and let me walk the rows with him as he did his evaluations. He never pressured me, but I am a plant breeder today because of his example. I remember well our first conversation on the phone when he offered me an assistantship and I had the gall to tell him that "I would work with him on the ecology of the native strawberries, but I did not want to be a plant breeder." His quiet example turned me completely around and I am so grateful he showed me the light.

The huge success of the strawberry breeding programs in California can be documented by looking at production figures. In 1956, yields per hectare averaged 15 Mt, and California had 35% of the U.S. market, while in 1990 when Bringhurst retired, yields per hectare averaged 60 Mt, and California had 80% of the U.S. market. Yields across the rest of North America except in Florida, often are less than 5 Mt. Of course, Bringhurst and Voth cannot take all the credit, but it is safe to say that they added their own special brand of magic to the wonderful, diverse germplasm developed by Goldsmith and Thomas.

Literature Cited

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