

WHERE FROM AND WHERE TO . . .

TOK FURUTA¹

*Batchelor Hall Extension
University of California
Riverside, California 92521*

For the next few minutes, I invite you to join me in doing something rarely done at these meetings. I invite you to take this opportunity to dream—to look at where the nursery industry and plant propagation have been—where from. This look will not be sharply focused—rather it will be somewhat out of focus and somewhat directionless so that the essence of what was there will seep into our thinking without conscious direction.

Then, I want you to join me in directing this receptive mind forward—to where we are going—where to? In preparing for this discussion, I wrote several colleagues inquiring of their thoughts on where the industry is going and what it would be like.

“My dreams . . . do not extend 25 to 50 years ahead. Yours probably do not either . . .” wrote Professor Elton Smith of Ohio State.

“One thing is for sure, the mule and Ga stock plow . . . is not going to be a part . . .” wrote Professor Fred Perry of Auburn University.

More of the same, others responded. If it is to be more of the same, it will probably will be with more emphasis.

TAKE YE SOME WILLOW AND CATTLE DUNG . . .

It is humbling to look at the past . . .

Marcus Porcius Cato describes how to graft trees in his book “On Agriculture.” The time is spring, the materials include a split of willow, a hard stick and a stock mass consisting of “clay or chalk, a little sand and cattle dung . . . fit (scion) bark to bark (with stock). . . . Wrap the Greek willow thicker, smear the stock with the kneaded mixture . . .”

“The scions are pushed downward between the bark and . . . grafted stub is then thoroughly waxed.” This is from *PLANT PROPAGATION* by Hartmann and Kester.

Cato's works were written sometime between 243 and 149 BC. Hartmann and Kester, third edition, is dated 1975. What has changed over 2200 years? We use nails rather than willow splits to secure the graft. We use grafting wax rather than a mixture containing cattle dung. We do not cover the entire graft with leaves and tie them into place.

¹ Extension Environmental Horticulturist

Let me add a couple of other seemingly unrelated facts or opinions . . .

Many years ago, one of my professors said—perhaps in jest or was he serious—that he almost discovered plant auxins as he studied the stimulating effect of animal urine on plant cells.

Older books on horticulture contain references to the stimulating effect of liquid manure on plant root growth. As recently as the 1950's, the practice of applying liquid manure to potted plants was carried out by many growers. Admittedly, many of these growers trained in the traditional ways and may have lacked “scientific basis” for their practices.

The stimulating effect of extracts of willow on rooting of cuttings has been documented by competent scientists, both academic and practical.

We are aware of the inhibitory effect of sphagnum moss on microbial growth. Recent studies by plant pathologists seem to demonstrate the effect of organic matter other than sphagnum on inhibiting root rots.

Without question, the grafter is more productive when we nail in the scion and coat everything with grafting wax. Additionally, everything is much neater. Imagine how many of us could tie willow splits to keep scions in place. So, not many of us will want to go back to tying the graft with willow splits and coating with a sticky mass of . . . however, there are some questions which could lead to . . .

Was there a stimulating effect on cell division and graft union by the use of willow splits?

Was there some effect from the cattle dung?

Did the cattle dung serve to inhibit diseases and other harmful organisms?

Witches brew or wives tales, not worthy of serious consideration, let alone scientific research? I need only remind you that Nurse Seed Grafting resulted because Professor Moore of Auburn University wanted to investigate whether there was any truth in the tale that inserting a grain in the base of grape cuttings stimulated rooting of those cuttings.

Where to . . .

TAKE YE SOME AGAR . . .

“. . . we will be refining tissue culture and developing shortcuts . . .” predicts Paul Bosley, Sr. regarding the future of the nursery industry. So, also, says Bruce Briggs, “New cultivars may be created by genetic engineers involving some tissue culture . . .”

If cattle dung was necessary in grafting trees in Rome during the 2nd century BC, so then agar may be necessary in the 21st cen-

ture in the United States. Tissue culture has had a tremendous impact on agriculture. Genetic engineering has had more of an impact on medicine than on agriculture. However . . .

Can graft incompatibility be overcome by genetic engineering and tissue culture? Already, we can isolate numerous mutants of plants by tissue culture procedures that permit single cells to form entirely new plants. The same techniques, coupled with deliberate exposure to diseases or various stresses such as salinity, have isolated cultivars with disease resistance or tolerance to stresses. Can the technique be applied to rapid selection of understocks that are tolerant to the stresses and resistance to the diseases, at the same time becoming compatible with the scion? If dreams are where scientific research and subsequent papers begin . . .

Where to . . .

TAKE YE A LITTLE BLACK BOX . . .

When plant explorers left England, France, and the other countries in the 1600's and the 1700's, they only expected that their reports and plants would speed along as fast as the wind. What a difference today when we can send the entire text of our proceedings electronically in a few moments to locations on the other side of the world, and we do not have to even type the words. Black boxes will read the pages, transmit the words, pictures and charts, and even reproduce the page at the destination, including all of the errors.

Today, black boxes can control the environment within buildings, including greenhouses, and control the scheduling of irrigation and pest control to fit the needs of the plants.

Today, black boxes can give us more paper and information that we care to have.

Computers and microprocessors are changing the way we gather and handle information of all sorts, but the speed of comprehension by people, the speed of understanding the message as contrasted to hearing the words has not changed.

Where to—people will be necessary to make decisions. To do so, they must understand and comprehend.

Where to—someday, all of the information needed for the culture of a specific crop, or the propagation of plants will be stored in computer memories, just as the information is stored in your memory and mine now.

Where to—there already exists programs for computers that will make us better spellers. The computer beeps when we spell a word incorrectly. Programs even exist to make us better writers. At least we will follow the rules of those that made up the program. The trouble is that it would make all writing the same. The Gettysburg Address and Mark Twain's "The Adventures of Tom Sawyer" failed

to meet the criteria of good writing according to this computer program.

Where to—we still will have a space for the Mark Twains of the future.

TAKE YE SOME IDEAS AND SOME SOLUTIONS . . .

“. . . hoping you can expand, realizing nurserymen look at the situation differently than you research people.” So commented Bruce Briggs in his wonderful response to my query about the direction of nursery and propagation in the future.

Research people everywhere seek ideas. Professors and academicians everywhere want ideas around which research can be conducted, around which discussions can occur. In the process, numbers are produced and the validity of the numbers and the resulting conclusions are debated.

Nurserymen are seeking solutions to problems.

Where to—we will continue to have the freedom to do things badly. We will continue to have the freedom to fail, to create and to invest. We will have the freedom to reap the rewards of our individual efforts.

I DARE . . .

Sometimes it is the poet, not the scientist, the doctor, nor the futurist that places our minds in the proper mood.

George Bernard Shaw—“I dare to dream of things that never were . . . and say . . . why not”?

This has been but a sampling of a large mass of information that floats around. “A lot of what you talked about is not scientific,” I can hear many academic snobs snort. “It’s too empirical,” I hear others. “It would not stand up to peer review” would be the ultimate putdown by some.

It is not the intention of this discussion to point out the road. Rather, it is to dream of where we have been and the dream of things to come. How many of us will be willing to say with George Bernard Shaw, “. . . why not”?