

greenhouse conditions. This work has been published by Dr. Heisy of the Carnegie Institute.

RALPH JACK: I have found that *Abies magnifica* or silver tip fir from 8500 feet elevation in the Sierra Nevada mountains back of Fresno does very well in Silvertown, Oregon. This observation follows the botanical rule that a given number of miles north is equivalent to a given number of feet elevation.

UNIDENTIFIED SPEAKER: Christmas tree growers in the Dakotas who buy black spruce seed from the southern limit of the spruce area are getting very poor shapes, with branches far apart. Seed from the northern part of the spruce area gave very good shapes. This was probably a difference in the response of the two types to daylength.

WALTER KRAUSE: Our first panel this morning is on roses; this is a subject dear to many persons hearts. The moderator for the panel is Dr. Tok Furuta of the California Agricultural Extension Service. Tok.

TOK FURUTA: Thank you, Walt. You are right on the fringe of perhaps one of the greatest rose growing areas in the country. I am not sure if we surpassed Texas yet or not, but we have come pretty close to it if we don't. We have a very great concentration of rose growers about 100 miles south of Fresno and we have a few others in the state of course. There is one in northern California and we still have one back in the southern California.

I should like to open the panel by asking you a few questions about rose plant production.

AN APPROACH TO ROSE PLANT PRODUCTION

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What is the role of diggers, nippers, or chicken pickers in the production of dormant eye, started eye or two-year rose plants? And is there a relationship between fertilizers and the type of diggers in rose plant production? Many questions such as these should be answered by each producer and consultant because the production of rose plants depends upon the economical functioning of a balanced system of production, and the system functions efficiently only when these questions are adequately considered.

The production process or system currently used for started eye and two-year rose plants may be subdivided into approximately 12 major stages or steps. (For dormant eye plants, a step (9 below) is omitted.) These are:

1. Preparation of the land.
2. Gathering, processing and lining out understock cuttings.

3. Gathering, processing and storing scion wood.
4. Providing cultural care for the rooting of the understock.
5. Providing cultural care for the growth of the understock prior to budding of scion variety.
6. Budding.
7. Cultural practices to assure union of bud.
8. Removal of understock above inserted bud.
9. Providing cultural care for growth of scion variety.
10. Harvesting of plants.
11. Grading of plants.
12. Storage of plants prior to shipment to customers.

Without going into specific details it should be obvious that for each stage there is a need for the coordinated use of materials, machinery or labor at a subsequent stage. Two examples should suffice. (1) Use of large amounts of fertilizer on understock plants prior to budding (stage 5 above) may seriously influence the efficiency of budding because of excessively large plants. (2) The cultural care provided in stage 9 definitely influences the efficiency of the grading line in stage 11.

By approaching production of rose plants from the systems approach, we will emphasize the overview and the interactions. And we will provide a framework that permits evaluation of techniques, materials and machinery. For example, suppose we desire an automatic budding machine. A complicated, mobile, sophisticated machine to replace man in step 6 is technically feasible, but it would be a poor choice among alternates. A more practical solution would be a different system where budding is done before the understock is lined out. At this point in time, I know the procedure is possible. A new system of 12 steps evolve. Note the number of steps have not changed but the machinery and labor requirements have.

1. Preparation of the land.
2. Gather and process understock.
3. Collect and process scion varieties.
4. Bud scion to understock.
5. Treat dormant buds for root initiation and bud union.
6. Line out dormant buds.
7. Cultural practice to complete rooting and early growth.
8. Remove understock above bud.
9. Cultural practice for scion growth.
10. Harvest of plants.
11. Grading of plants.
12. Storage prior to shipment to customers.

Obviously, there are many approaches to field production of roses. Approach each step as a part of a system but do not be afraid to ask why.