He is going to speak to you on "Propagation Toward a Fast Turn Over", which sounds very interesting. Now I would like to present to you, Carl Zangger.

PROPAGATION TOWARD A FAST TURNOVER

CARL ZANGGER
Perry's Plants, Inc.
La Puente, California

Perry's Plants are growers of ground cover plants, mostly herbaceous types of perennials, and low-growing woody ornamental plants, as well as annual and perennial bedding plants. We produce several hundred thousand flats of these types of plants each year and are in production twelve months of the year.

All of our production is grown in standard southern California nursery flats, which are approximately 18 inches square and 3 inches deep. To us the unit of production is a flat, not a single plant. Most flats are planted 100 plants per flat although some have as few as 48 depending upon the plant and the specifications for a particular job

Almost all of the material we grow from cuttings or divisions are rooted and sold in the same flat without transplanting; seedlings are started in seed flats and transplanted Most varieties we grow are ready for sale in 30 to 90 days although a few slower growing types may take up to 120 days. Since most of these are grown quickly, it means that they must also be sold quickly or they become overgrown and have to be discarded. As everyone knows there is no profit in the dump pile. So it becomes extremely important for us to program our production according to the demands of the market.

Through all the years we have been in business we have maintained records, by the month, of each variety of plant we sell. Those of you who have done this will find, as we have, that most varieties fall into a pattern of sales, month by month. It is true, of course, that extraordinary circumstances such as one large order can affect the overall picture severely. However, each month, after we have accumulated the data on sales, we go over our merchandise "take off", as we call it, and make notes. If there was one large order for a particular variety we indicate this; if we had too many plants of a variety we note this, or if we were short and needed more plants we also indicate this. We make notes on the weather, such as particularly long rainy spells that would stop sales or affect either growing or sales. We establish quotas of each variety of plant that we want to grow. The information that we have accumulated now becomes very valuable to us for we know how many plants we sold in the same sales period the previous year; we know if there were any abnormal circumstances. We then take into consideration the condition of the market for this season and

we establish the quota we need to produce. We normally set this quota at least 3 months ahead so that we can see what is before us and plan to have the necessary material — cuttings, seeds, etc. — available at the proper time. Our production is then planned a week at a time. Each Friday we lay out a production schedule for the succeeding week so each week we are, in effect, reviewing and revising our projection. We are not perfect by any means but we are able to have a sustained production of most varieties that we grow and we are right more times than we are wrong.

In our operation we have attempted to make each job as simple and uncomplicated as possible. For example, we use just one soil mix throughout our nursery. This mix is used for planting our seed, transplanting our seedlings, or sticking cuttings; as you can readily see this eliminates the necessity of someone having to make a decision on what to plant each variety in. Our soil mix is composed 50% of a composted redwood sawdust which contains all necessary growing elements with the remaining 50% consisting of equal parts of fine sand, peat moss and perlite. All of our soil is mixed in stationary mounted concrete mixers. While it is mixing we inject steam into the mixer and bring the soil temperature to 180° F. The mixer is then turned off and the soil allowed to set for 30 minutes after which it is run into our flat-filling machine. This machine is capable of filling whatever type of container we are planning to use; it will fill flats at the rate of 16 per minute. The flats of soil are stacked on pallets and taken by fork lift to whatever planting area they are needed. In our production of bedding plants we have established a very routine process. Soil is taken to the seed house where it is placed on the greenhouse bench. The soil is fluffed by hand. Then we put a Ross fan-type sprinkler on the hose and turn the water on with a very sharp spray. This spray is run over the flat which agitates the soil and fills the flat with water. When the water drains out of the flat the soil settles to an even level seed bed and then each flat is uniformly watered. In settling, a small amount of peat and some fine components of the soil mix rise to the surface. This makes an excellent seed bed upon which to broadcast our seed. The seed is placed in the flat, lightly moistened, then covered uniformly with a crushed granite rock. When the seedlings have germinated and grown to a desired size they are moved onto hardening-off benches from whence they are taken to the greenhouses for transplanting. All transplanting is done at the bench where the plant are to be grown. We employ women to do all of the transplanting because they are more dexterous with their fingers than men and of a more even temperament, enabling them to do routine, repetitive jobs day after day with no frustration. The flats of transplanted seedlings are generally in the greenhouse for about a 10-day period, but occasionally are there up to two weeks. After the plants have grown to the desired size they

are ready for moving to the outside growing areas where they are finished off. To facilitate the moving of flats we have designed our greenhouses so that we can open doors running the entire length of the greenhouse at the bench level. The flats can be moved out at any desired point along the greenhouse rather than carrying them down the aisle for removing from the end doors. The flats are put onto racks and the racks are transported either by fork lift or a train of small carts to the desired outside growing area when they are placed and left until they are sold.

Many of the same procedures we use in producing our bedding plants from seed are also used in the production of the plants we grow from cuttings or divisions. Again we have attempted to make the job as simple, quick and easy as we can. As every grower knows, having a source of good quality material from which to propagate is of prime importance. This is certainly true with us. We maintain approximately 10 acres of plants growing in beds in the field from which we can take cuttings. It is necessary to have these plants in a good vigorous growing condition in order to get the best quality cutting wood. Our fields are rotated constantly and each year we do a considerable amount of replanting so that we may have plants coming on constantly. We fumigate most of our field growing areas with methyl bromide plus chloropicrin prior to planting to eliminate fungus diseases as much as possible and to reduce the weeding problem. Cutting wood is brought in from the fields each morning prior to the arrival of the crew who will be making the cuttings. The wood is taken to the various houses where the cuttings will be processed and stuck into the soil mix; it is placed on the benches of the misting houses or growing beds depending upon where the crop is to be grown. Women make the cuttings, either with a knife, shears or by snapping the wood. We prefer not to use either a knife or shears on any variety where the wood can be snapped for with the latter method we find less incidence of fungus diseases. After the cuttings have been made they are placed into tubs of fungicide made up of Morton's Soil Drench and Terrachlor. After soaking in this dip a few minuutes they are taken out and stuck into the growing medium. Flats of cuttings are then placed under mist on the bench. Our misting systems are the conventional intermittent type controlled by clocks and timers. When rooting has been initiated the mist is turned off and the plants immediately fed and allowed to harden off in the house after which they are moved to outside growing beds for finishing and sale.

All of our outside growing beds are covered with automatically controlled sprinkler systems. We have found this to give us more uniform watering than hand watering and also more uniform growth. Also we have eliminated a tremendous amount of labor. Automatic systems are great and we highly recommend them; however, they can break down and it is im-

possible to completely eliminate the necessity of having a good mechanically inclined man to look after them.

Another great aid to us is our water treatment plant. We run all of our water through a deionization unit which completely removes all of the minerals from our water. The resulting water after treatment is nearly as pure as distilled water. After deionization we mix back in a proportion of the untreated water and then inject into our water system a small amount of fertilizer. So each time we water our plants we are using a water which is low in harmful salts and feeds the plants at a regulated rate. Initially when we installed this system we found that we had to do a lot of reprogramming of our crops as most varieties then grew much faster.

In summary, we have attempted to forecast our production based upon as many known facts as possible. We then have broken each job of production into a set procedure which can be followed by relatively unskilled people. The facilities for production have been provided to suit the requirements of our particular type of growing; each job is mechanized as far as we are able to do at this stage of our development. We can now maintain a constantly regulated production aimed at fulfilling the market demand. We are not perfect — probably never will be — but we have enjoyed a growing market year after year and the future looks as bright for continued growth as at any time and we intend to keep growing.