

of the clay pot was sufficient to prevent this happening.

By the middle of October, the standard fuchsias were transferred from the glass house to the shadehouse, and the final "hardening off" was in process.

Constant attention was still being paid to hygiene and cleanliness, with regular sprays of fungicides and insecticides.

During the first week of November, the plants were given a thorough soaking in preparation for removing from their pots and planting out into open beds.

### SUMMER BEDDING SCHEMES

Standard fuchsias were used as specimen plants, under which bedding begonias were massed. They are also attractive for bordering a path, the same way that standard roses are employed. They may also be used as specimen plants throughout a display greenhouse.

About a month after the cutting material was gathered the standard fuchsias were lifted and stored in sawdust frames within the shadehouse over the winter period.

### WHAT HAPPENS TO MY MANHOURS

WILLIAM ROGERS

*Australasian Nurseries  
Pakuranga, New Zealand*

This paper is a description of a set of records I kept for a period of four years which helped me to go about my work more efficiently and make better use of my labor force.

I am the Production Manager of a container shrub unit attached to a mainly retail nursery. The production area covers about two acres and has turned out from 40,000 to 70,000 units a year of from 5-inch to 1-gallon sizes. I have a staff of 2 to 3 males and 2 females, mainly trainees. When I came to my present job ten years ago from growing house plants, the methods, soil mixes and so on were all new to me. The nursery was fairly new; the firm's outlines were set out but, in detail, were fairly sketchy. If one area of the nursery was under pressure we could be called on to help out.

It was felt after 12 months that productivity was too low, and I was encouraged to do some reading in management and work study. One of the main problems was to find out WHY we

weren't turning out as much as expected. We were keeping monthly records of production bumbers, cuttings, pricking out, potting done, etc. Financial aspects were not my problem, but I wanted to know how much staff I was using and what they were spending their time on. This was tied up with other problems such as wastages — plant losses, knowing what the customer wants — when to have it ready, knowing growth, so one could produce the plants in the shortest growing period. These are all part of nursery efficiency and affect the manhours used. My immediate requirement was to find out just what people were doing and to see if I could improve the job from that angle.

I decided to keep hourly records. The first part was collecting raw material — what people were doing. We were using a sizable timesheet and were able to write down up to eight items each day if it was required. Jobs were recorded to the nearest quarter hour. This was reasonably accurate when people were doing bulk work, not so good when they were ducking off to do 10-minute watering jobs, making tea, doing small repair jobs or, in my case, answering queries. Staff wrote up their activities at the end of the day. It might take them a minute to do this. It took me half an hour a week to enter up on a weekly record. I make a 10% allowance for inaccuracies. It is often hard at the end of a day to remember exactly when one starts or ends a job. Major activities such as potting tend to be inflated, small jobs tend to disappear. I also “lost” the tea breaks about 1/16th of each day. However, the records did give me a rough but reasonable outline of how much time each of the major nursery activities was taking under our particular circumstances.

At the end of the week when doing timesheets, I entered the itemised manhours on graph paper under their headings. At first I had some difficulties with the headings, the job appeared so varied, but after six weeks I found which were repetitive, or parts of other jobs, and was able to reduce the number. I also began to find which jobs were occupying most time, areas of work to concentrate on. A boy might spend 4 hours a year hedge-cutting, but 10 hours a week potting. If the hedge cutting was a bit rough or slow, too bad; if the potting was poor or slow that WAS something to worry about.

The weekly record shows the main job headings. On the left is given a summary of the hours worked per person; on the right the manhours are analysed.

The third table is a quarterly summary of weekly activities. To visually find out where the time was spent I marked a square containing more than 10 hours per week with a coloured pen. This way I could pick out the problem areas more clearly for further study.

From the quarterly summary, as time went on, I made a further summary of these sheets. I spent many half-hours after dinner in the evening with the sheets going over the jobs, rearranging them in my mind to see if I could organize them better. I will now go over a few of the jobs and discuss them in a little more detail.

Potting quickly showed up as the biggest time-consumer. The term, potting, as used here, covers a series of jobs from sorting and collecting plants, taking them to the potting bench, putting them in containers, pruning and staking if necessary, taking them to the standing area and watering in. It isn't an entirely standard process and has been altered from time to time as much as possible to speed the process, occasionally to fit round some obstacle. For instance, at one stage we took all the plants to the potting shed for potting, then took them to the potting area. Now in the summer when fine weather is fairly reliable, we collect all our materials near the standing area and pot there. It saves a lot of transporting to and fro.

**Weeding.** This is not a popular job and there is a lot of it; most of the staff is under 20, often temporary, such as schoolboys. After a lot of fighting over it, the boss wanting high standards, the youngest objecting to the boredom and backache, we find it most satisfactory to do four hours a day, preferably in the morning, in good weather, with the foliage dry. Everyone on it while we are fresh and then do something more varied and enjoyable in the afternoon. Rather than grumbling about missed weeds which gets me nowhere, I follow round checking each frame for odd weeds.

**Soilmixing.** We have an old chicken feed mixer — a third of a yard of mix at a time. At one stage there was the problem of who was to do it. This job to some extent depends on the people. I had one man quite happy prefilling bags all day long. Others on the staff weren't quite so enthusiastic; it is a bit hot and a bit heavy. It is partly a matter of taking turns, or having two on the mixer, particularly in hot weather.

**Supervisory problems.** This is time I spent on a variety of activities: planning, answering queries, getting advice, keeping records. At the beginning of the period I was spending a lot of time learning the job. I also had more staff, much of it very short term which meant more training, more planning, more supervision. Over the 4-year period the man-hours per year dropped from 10,000 to 8,000 for the same output of plants. Now my staff is less — and what I have — more permanent. I can spend more time on the job working with people individually, and as a pacesetter. The reduction in manhours is largely from schoolboy and short-term people.

This method of visual recording helps keep things in proportion. Problems that were looming large in my work seemed less disturbing when put down on paper, and the really time consuming ones were much more conspicuous.

**Shifting.** This heading covers the movement mainly of plants from one area to another, without other work being done to them such as potting. It is often not productive, and at the beginning of the period took quite a lot of time. Sitting down occasionally and making lists of plant movements can help cut out unnecessary shifting. For a while we did some of the warehousing — preparing plants for sale. The number of times a plant is handled from the time it is selected in the production area to the time a customer selects it is at least six to eight. These movements are: selected from production frame, taken to road, weeded and staked if necessary, labelled, put into trailer — taken off in sales area and put in frame — selected by customer. If things aren't going well quite often the movements are more convoluted than that. The movements within the production area dropped from 150 manhours to 75 over a period of four years. This was partly due to improved equipment, we went from an old 15 cwt truck which involved a lot of heavy lifting and carrying to low trailers which could be maneuvered to the exact spot of handling.

We also examined procedures. In the middle of summer some small stock was put in a shade house then after a month, when it was established, shifted outside. Now it is put straight outside with a few taller plants dotted through it to break the wind and the sun. Frost-tender stock, when potted in the autumn, goes straight under frost control sprinklers. Fast growing stock in summer is spaced slightly when putting down, so it doesn't need rehandling. I try to train staff to think in terms of minimum handling. If they are not well organized, people can work hard and yet get little done. I try to make them think first, so that they can get through a lot with minimum effort.

**Hand-watering.** We have an automatic watering system, but in dry periods there are always a few plants that dry a lot faster than the rest. From October on, we try to keep grown stock between two sprinklers. It can often be worked while clearing frames for potting so a special effort isn't required. Getting plants well under sprinklers takes only as long as one hand watering, and we always have an extra check round before the Christmas holidays, when we are likely to have sketchy and untrained staff which makes the job very slow. I try to have as little overgrown stock through this period as possible, seeing what is kept is pruned or potted where necessary. We try to keep hand-watering down to three times weekly and to as few lines as possible.

Some jobs such as feeding-topdressing the containers at four to six weekly periods haven't shown much improvement. We did examine prills at one stage, but they didn't seem to fit into our programme. With three to six monthly feeding periods with mixed stock, some stock was likely to be missed, other stock getting too much too soon.

**Cuttings.** We set daily targets of 2,000 cuttings for four people, about 28 manhours, then see how near they get to it. This includes collecting, making, planting, putting away and records. Time taken varies with the kind of cutting and experience of the worker. Knowing what to grow and when; with concentration on hygiene, are big helps here.

**Pricking out.** We used cardboard sections (Dividers) rather than 3" pots. This job is fairly routine. Two ladies can plant 1,000 rooted cuttings a day into divider boxes provided rooting is even; there is not much replanting of unrooted cuttings, and the roots don't have to be trimmed because they have got too long. Seedlings at the right stage can be handled much faster. It is a matter of acting promptly, and doing the job regularly once a week, so the roots don't get out of hand.

Some of the jobs, such as "picking over" are routine tasks. It has to be done daily. It is done in the minimum time, for us not more than half an hour on Mondays, quarter of an hour the rest of the week. Restanding plants after winds is an irritant. We use corrugated fibrolite, which is good for drainage and hygiene, but not so good for taller stock. Having plants grouped together or roped around helps. Cold frame opening takes time during the frosty months. How much time and when? These jobs are not big time users but take manhours away from the more productive tasks.

**To sum up.** Much of the value of the record-keeping was in short term comparisons. We potted 800 plants into gallon bags in 60 manhours — could we do the same again next time. We did the weeding in 80 hours; could we keep it up? If not, why not — if it was better why was it better? Jobs were often broken up between weeks. These records helped to reassemble the hours put in. Over a longer period it gave me a picture of where the bigger proportions of time were going. It also helped me to use staff better. People, particularly boys, get tired of weeding for long periods, and also sitting, making cuttings. They want to try these jobs out, but half a day at a time.

Since I discontinued the full detailed list of work done, I have kept a sheet of weekly manhours per person. This compared with monthly production totals, plus background knowledge of where the time is going gives me an adequate idea of whether we are being less or more efficient for our circumstances.