Metrolina Greenhouses Internship, 2013

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Pictures cannot describe just how large Metrolina Greenhouses is. From the road it looks like an endless sea of glass, an unbelievable site to anyone who passes by. It’s the largest single-site heated greenhouse in the US, 164 acres under roof and 30 acres of outdoor growing space. They have about 600 year round employees, and hire an additional 200 in the spring and fall. I was one of those employees during my five month internship with the Ball Program. My experience there was just as amazing as the place itself. I grew a lot from the experience, professionally and personally.

The number one objective of an intern assistant grower is to learn to grow top quality ornamental crops, complying with the schedules and parameters set by the company. This includes keeping the crop’s growth on schedule by using growth regulators. The strongest growth regulator is simple: water. Growers also must follow pesticide, fungicide, bio-control, fertilizer, and trimming schedules.

In my five month internship, I was able to work in all four sections of the greenhouse and also spend time in the office. My responsibilities on a daily basis were irrigation of crops, managing the irrigation systems, scouting crops, application of chemicals and bio-controls, greenhouse sanitation, and other odd jobs. Organization, preparation, and time management were all important skills to have when managing a large area with a limited amount of time. I found that my responsibilities took much less time to complete and were much less laborious in the sections with more automation.
Irrigation of Crops

Irrigation was my most important responsibility. I learned to make quick irrigation decisions based on the when plants were last watered, the weather, and the specific irrigation needs of the crop. Knowing the weather was very important. On a rainy or cloudy day there was no irrigation allowed, unless the plant was wilted. The goal was to irrigate the day before, in preparation of the weather. This prevented disease. On hot days, everything had to be thoroughly irrigated.

The weight of the container was the quickest way to determine the need to irrigate. If the roots were developed, I could also flip the pot over and take the soil out to see if the bottom was moist. Air movement, heat, abnormal color of leaves, and color of the soil were also clues to which plants were drier.

I had to know the specific irrigation needs for all of the crops. Young plugs, with developing roots, were the most sensitive plants to irrigate. If begonias, bacopa, diasha, and verbena were less than a 4/5 on the wetness scale, the soil would dry out and the plant would wilt. If given too much water, there wouldn’t be enough oxygen in the soil for root development and the plant would be susceptible to disease. After watering gerberas, I even had to dry them off with a leaf blower to prevent leaf distortion. As the plugs got older, the leaf area would expand making it hard for water to reach the soil.

The bigger the container, the longer it takes to dry out. Irrigating finished containers was a lot less complicated and time consuming than the plugs. However, even larger plants can have sensitive irrigation needs. For example, Vinca and rosemary have high risks of blight and root rot. Irrigation was only allowed once the container was very light. Fuschia and ferns had high irrigation needs. Water is the most powerful growth regulator. To push plants too small for their age to grow faster, containers were watered extra heavy. Plants too big for their age were kept as dry as possible and given the growth regulator, Bonsai.

I was trained to use boom, ECHO, drip, rain bird, flood, and hand irrigation methods. I learned that certain irrigation methods were better suited for crops with specific irrigation needs. For example, flooding is great for plants that need a lot of water, have a large leaf area, and have
sensitive leaves. Instead of running off of the foliage, the water is absorbed through the bottom of the pot and the leaves aren’t damaged from overhead watering. However, detailed growth/water relationship knowledge is essential. For example, flooding vinca will kill. When crops with high and low irrigation needs were mixed together, neither could be irrigated properly.

Managing the Irrigation Systems

Metrolina relies solely on rainfall for the 1.5 million gallons of irrigation water it uses daily. I enjoyed learning about their amazing retention pond water filtration system that makes this possible without using any chemicals! I also learned how different feed tank systems, injectors, and feed formulas are used. While I was irrigating, it was my job to refill my feed tanks when they got low.

In plug production, every morning I would measure the electrical conductivity (EC) of the boom water, for each of my acres. If the EC was 600 or lower, the feed wasn’t coming through the boom. I also learned about deficiencies and problems caused by low or high ECs.

For more than two months, I was responsible for irrigating and rotating a total of 214 echos daily. On hot days, it was common for me to use 200 gallons of feed. Each echo took about 35 minutes to irrigate. I used a metal pole to pull down and check all the lower hanging baskets. I had to organize and manage my time wisely to properly check and irrigate all of the echos. I learned about problems with water pressure, how the pipe systems are designed, and how to fix broken pvc and copper pipes. Some baskets would dry out quicker than others in the hotter parts of the greenhouse. It was my job to keep the echos even by rotating the baskets.

On the weekends, it was my job to irrigate three acres of greenhouse using rain birds and hand watering, plus the 214 echos. In preparation, on Friday I would thoroughly irrigate and plan what needed water on Saturday and Sunday.
I was trained to check and irrigate four acres of shipping belts. In the mornings, I checked the belts and started a max of ten booms. On a hot day, it was normal to give ten passes to a bay, which took about two hours. The goal was to finish watering before lunch at noon. Like the echos, this job also required time management skills.

In propagation, I was introduced to the boom irrigation system and in the MX sections I was introduced to the, much larger, boom cage systems. I was trained how to set up the magnets and program the booms and the drip systems on the cage.

I spent my last four weeks in flood and drip irrigation in MX2. I learned the correct step by step way to flood and drain a bay. If I forgot a step, many bad things could happen. If I put the center plug in incorrectly, the water would drain out of the bay into the retention pond. If the drain valve was broken, the water would drain into the filter return pit. If the fill valve didn’t open, the fill pipe could burst. I learned how water and fertilizer are saved by filtering and recycling the flood water. However this can also lead to the spread of pythium, a deadly root rot causing pathogen.

I was responsible for the drips: 20 bays on the weekdays and 40 bays on the weekends. I had to multitask to complete everything within a limited amount of time over the large area. I had to always keep track of time and know when the next flood would start.

Lastly, I enjoyed learning how fog particles are created and how fog irrigation is used in vegetative propagation.

**Scouting Crops**

Dr. Koraensky, the company’s plant expert, stated the assistant growers have the most important job, “working directly with the entire crop.” It was my job to keep the plants thriving, monitor them daily, and report anything...
abnormal. This type of scouting identifies and fixes disease problems and insect outbreaks. I performed weekly duties of recording the insect counts, taking soil samples, and recording the heights of mums to better monitor the status of the crops.

I weekly identified and recorded the populations of fungus gnats, spider mites, white flies, shore flies, leaf miners, aphids, and thrips onto a database. I learned which plants the insects were most attracted to. When the populations were too high, pesticides and biological controls are applied. One of the grower’s goals was to find out what week the thrips arrive. Then next year they’d use that knowledge to spray pesticides the week before.

I took weekly soil samples to monitor the pH and EC. The plant’s name, the grower’s name, order number, week planted, size of plug, and the location and sample cup number were recorded in the database. If the EC was too low, high feed was given to the plants. If it was too high, the plants were irrigated with plain water. If the pH was too high, it was lowered with sulfuric acid or 21-7-7.

I measured and recorded the mum’s height each week. These measurements were compared to a growth chart, letting the grower know if the crop was on schedule. Fertilizers and growth regulators were used according to the growth schedule.

The status of the crop is monitored by the media, roots and shoots. Dr. Koraensky calls this the MRS method. To diagnose and cure the crop, I needed to know the crop’s key factors. If shoots of the calibrachoa are yellow, it most likely means the soil pH is too high. The pH is lowered to the appropriate 5.5 – 6 by using sulfuric acid. If a crop is too tall it could be due to the temperature being too warm, not enough light, or too much nitrogen. Growth was corrected by moving the plant or giving it growth regulator. A plant has Pythium when its roots are yellowish brown and the cortex sheaths off. The dead plants are removed and the crop is given fungicide.
Application of Chemicals and Bio-controls

Bio-control and spray schedules were used by the growers to prevent insect and disease outbreaks. When developing problems were identified, growers reacted quickly with weapons of science, namely pesticides and fungicide. I learned about the different types of bio-controls and chemicals used, how they were applied, and how they work.

Knowing which pesticide or bio-control to use was tricky because of the different stages in the insect life cycle. Bio controls usually only target one or two stages. Pesticides could also be toxic to the beneficial organism. The pesticide Hexygon® only kills immature stages of spider mites. It also renders the exposed eggs unviable.

There were five spray schedules: one schedule for plugs and four schedules for finished crops. On the weekends, it was my job to spray the scheduled pesticides and fungicides. I learned and followed the personal protection and re-entry interval requirements. I calculated, measured, and mixed the specific amount of water and chemical product that was needed. I was trained to properly use and maintain the sprayer. I recorded every spray in the USDA spray logs. I sprayed up to 180 gallons per weekend.

I also applied herbicides, fertilizers, root inoculant, and growth regulators by drenching. I was trained to drench by boom, echo, table drencher, and by hand. I learned when to use what drenches and how to lengthen the effects. For example, after petunias are trimmed they are drenched with a mixture of Iron, 17-5-17, and 21-7-7. This helps fight disease.

Horticulture is about timing. To keep the crop’s growth on schedule, the growers used fertilizer, growth regulator, and trimming schedules. I learned about when to use these methods and how they affect specific crops.
Other Projects

When I wasn’t irrigating or applying chemicals, I was doing other projects. In plug production, the assistant growers would get together and pinch off hundreds of shoot apical meristems. This increased branching, making the plants grow fuller. I transplanted test plants for the test garden. Verbena, a procumbent plant, always needed to be trimmed. Plants past their shipping date also needed to be trimmed. Diseased and unwanted plants always needed to be dumped. The interns called these talking jobs, because we could talk with our co-workers. That made them the most fun jobs to do.

Sometimes I would get stuck with a project I really didn’t want to do. Plants had to be spaced apart once they grew too crowded together. This required us to move empty tables into the bay, a lot of painful heavy lifting. Afterwards, we would space the plant containers. Pushing tables also required a lot strength that I didn’t have. The transplant assembly line was the longest and most frustrating job, but I did get to learn about the machinery. Putting tags and stickers onto finished pots was a back breaking job. Pulling weeds and cleaning were jobs my growers told me to do when there was nothing else.

Although work was at times inefficient and unfit for me, I did learn from it. I learned it is very important to plan tasks so that they can be done as quickly and efficiently as possible, and I got to see the work environment and employment conditions of Metrolina’s 600 employees.

In the Office

I spent a few of my last days in the Metrolina office. I shadowed Travis Knoop manager of Walmart Sales, Angela Martin in charge of Walmart replenishment, Jarrett Bennett manager of “Plants, Partners, Ideas,” and Holly Hess in charge of social media and marketing projects. The company’s customer service, reliability, and marketing strategies are winning over their customers. I also learned how the company cut costs by upgrading to a new wood-fired boiler system and filtration system.
Metrolina has a partnership with Lowes and Walmart. I learned about the partner’s corporate budgets. The replenishment team analyzed all the store’s inventories, chose, and scheduled the specific shipments. The total sales of products from the previous years, helped plan next year’s production schedule and sales goals.

I learned how Metrolina does the marketing for their partners. They used surveys to see what affected customers’ purchases and got opinions on the new products. I learned how Metrolina employees, “People, Plants, Ideas,” trained store employees in keeping the plants alive and looking nice. This part of the partnership helps the stores sell more, which allows Metrolina to sell more to them.

Employee as a Host

I never thought I would have the confidence to go to a completely new place alone; but on February 3, 2013 it happened. I moved into the company’s house for the female interns. Metrolina provided a very nice house and two cars for the female interns to drive. They also provided internet, satellite TV, and almost anything else needed. All of this was for free, and I was paid $10 an hour in wages. Although I never met the owners (except for my first five minutes on site), they were overly hospitable. They would even give the students the leftover food from the catered events at the greenhouse.
The most rewarding experience was, unexpectedly, living with my fellow interns. I learned a lot from the international friends I made. I’m very grateful that I was given the incredibly rare opportunity to live with six girls: Luma, Rosangela, and Bela from Brazil, Weina and Zhenchi from China, and Dewi from Indonesia. It was so exciting to learn about their cultures, languages, food, music, places they had been and so on. Living with them the most liberating and rewarding experience of my life so far. I value the friendships and bonds we share.

Career, Education, and Future Plans

The Metrolina internship was definitely worth all my hard work and time, and I am grateful to the American Floral Endowment and Metrolina for making it happen. I gained more practical knowledge about horticulture from this experience than I ever have in traditional course and classroom work. I learned about the different systems and automation used in each production section and what plants need in the different stages of growth. I have a new understanding and appreciation of how much planning, science, and hard work goes into each plant.

Working with the Hispanic Metrolina staff and the international interns has motivated me to start studying Spanish again. Although I don’t know yet what my career path will be, I do have a better idea of what I want to do. The internship was a life changing experience that will stay with me my whole life.
Scrapbook