

Willoway Nurseries Production[©]

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Willoway Nurseries was founded in 1954 by Les and Marilyn Demaline. Although in the early days it was geared more towards a landscape nursery the owners always produced some of their own material. As (son) Tom and (daughter) Cathy grew older and they became more active in the business (now a wholesale nursery), more emphasis was placed on propagation and producing in house liners.

Personally, I started in March of 1980. Currently, my primary responsibility would be the management of the main container farm in Avon, Ohio. This consists of 100+ acres of container stock. Although I'm not directly involved with propagation I have a major impact on what the greenhouse department does for cuttings through the scheduling of maintenance and production of the cutting stock (salable inventory).

Back in the early days the propagation crew would go out with a list, find the plants, take the cuttings, strip, and stick the cuttings. If the plants were trimmed, sold or not big enough the cuttings would have to be taken at a later date, if at all. Using our own mix, we would fill individual peat pots and put them in flats. One of the first major improvements was getting sheets of peat pots that could be placed directly into the flat. Although initially filled by hand, these flat/insert combos are now filled by machine.

We have always tried to produce the majority (85% or more) of our own liner material. Currently we are taking over 3 million softwood cuttings. As one can imagine this can lead to some major problems in scheduling of work for all the departments involved in the plant production process.

Over the years we have accumulated records of when it was the best time to take the cuttings. With some plants it didn't matter as to when the cutting was taken. Some of the more difficult plants were based on a date as to when to evaluate the cuttings. These plants would take precedence over the other cuttings scheduled in that time frame. We have looked at tying the stick date to degree days but have found that the 2 week window we currently use works just as well. The other issue tied to the stick date was getting cuttings done early enough to meet the production schedules that we have set.

Due to the fact that a lot of things were remembered by several key people it was decided to use a database (FileMaker[®]) to form a "recipe card" to produce the plant. It was set up similar to a note card system (Fig. 1). The demo that you will see has evolved over time. Just like everything else we have adapted and changed to create something that gives us what we want or what we think we want at that point in time. We were fortunate to have Dan White to oversee the FileMaker system. He has done all of the custom work we've requested over the years.

With the FileMaker system a production card was formed that created the recipe for producing the crops (Fig. 1). The first line in the instruction was set up to read BUY or STICK. If it was a liner that was to be purchased (BUY) — it would then have a date placed on it as to when the best time was to place the order. This information would then go into the purchasing module and the information would be shared between the cards. The same thing would occur in the STICK mode (Fig. 2). This would have a date (1st or the 15th of the month) as to when the plant would be stuck. On the grower card the rest of the information would pertain only to the production of the plant.

Main Menu	Grower Card	Propagation Card	Field Grower Card	New Card Module	Bins	Purchasing	Admin. Module	Reports Module	Exit FileMaker	
List Cards	Can / Field Module	Can / Field Sheet	Scrap	Transactions	View Liners	Find	Sort	Show All	Print	Alert

Overview		Extended detail	
Notes	APR UPC <input checked="" type="checkbox"/>	UPC Code 19008	FM Code 4713 Original Code Support Loc. Main
Contract Grown: <input type="checkbox"/> Grown For: _____		Plant ROSE K.O. DBL KNOCKOUT	Patent _____ Size G2 KO Form _____
PP# 16,202 Tag QTY % 100 Virtual Inventory: <input type="checkbox"/>	Type: <input checked="" type="checkbox"/> Container Temporary Card: <input type="checkbox"/> Cancel Card: <input type="checkbox"/>	Source <input checked="" type="checkbox"/> prop <input type="checkbox"/> si <input type="checkbox"/> ww Yrs. in pot 1 Type CONTAINER Class ZROKN Shiftup Size _____	Plan Qty 17,000 Overage % _____ Prod. Qty 17,000 Mix _____ Cot _____ Winter Str. _____ Plastic
TPS	Prop. surv. % 80 Prop. Qty 21,250 No. per can 1	Rice Hull <input type="checkbox"/>	Sell Year 2015
	No. to sell 17,000 No. to shift 0	Trim Category _____	Planting Year 2013
		Stake Category _____	Finish Date 8/1/14

Costing	Budget	GP Inv. & Sales History	Crop Year	Sched. Date	Size	Spacing	Detailed Growing Instructions
Average Cost \$0.50	Display Price \$0.00	GP price _____	7/1/12	220			Stick
Avg. Freight Cost _____	Manual Price _____	Last Manual Price _____	5/1/13	218	0"		Shift 218 to p800ko, put in covered rose liner section
Marketing Cost \$0.15	Margin ?	Costing Code 02C Scrap Percentage _____	5/15/13	p800ko	0"		Mow trim plants as needed
Royalty Cost \$0.80			8/1/13	p800ko	12"		space and trim as needed
Prod Cost \$4.44			11/1/13	p800ko	0"		Consolidate for winter, Clear/White poly
Total Cost \$5.89			4/15/14	p800ko	18"		space and trim as needed
Shiftup Cost \$4.94			8/1/14	p800ko	18"		sell

Shift Date	Setdown Location	Number Shifted	Liners Not Shifted
5/18/13	02-SEC 1	1,332	
5/20/13	02-sec 1	11,100	
5/21/13	02-SEC 1	4,571	
Total Unshifted			

Supplier	Date Ord / Tkn	Ship Date	Date Rec / Stk	Load No.	Cost	Freight Cost	Size Ordered	Size Ack.	Size Shipped	QTY Ord / Tkn	QTY Ack.	QTY Ship / Stk	QTY Canned	Junk Can	# Per Can	Credit Rcv'd	Shifted
Willoway Greenhouse	7/17/12		7/18/12		\$0.50			220	21,250	21,250	21,250	17,003					17,003

Supplier: Willoway Greenhouse Date: 7/17/12 Ship Date: 7/18/12 Load No.: Cost: \$0.50 Freight Cost: Size Ordered: Size Ack.: 220 Size Shipped: 21,250 QTY Ord / Tkn: 21,250 QTY Ack.: 21,250 QTY Ship / Stk: 17,003 QTY Canned: Junk Can: # Per Can: Credit Rcv'd: Shifted: 17,003

Shiftable: Saleable Scrap Upshifts Misc. Adj. Production 17,003 Card ID# 73132

Fig. 1. FileMaker system and a typical production card for producing a particular plant.

Main Menu	Grower Card	Propagation Card	Field Grower Card	New Card Module	Bins
List Cards	Can / Field Module	Can / Field Sheet	Transactions	View Liners	Find

Propagation Information		Item code 4713	Last updated 9/20/13
Plant ROSE K.O. DBL KNOCKOUT	Size G2 KO	Form _____	Loc. Main
Plan Qty 17,000	Mix Ghouse Prop	Can Date 5/1/13	Sell Year 2015
No. per can 1	Tag Color _____	Cuttings Type D	Cuttings Category D
Propagation Method vegetative		Finish Date 8/1/14	

Crop Year	Stick Date	Size	Spacing	Detailed Growing Instructions
	7/1/12	220		Stick

Pots Needed 21,250	Cuttings Per Pot 1	Cuttings Needed 21,250	Sq. ft. 680.0	# Rooted _____	Avg. Weeks to Root _____
		# Flats 425	Bays 18.9	% Rooted _____	

Date Taken	QTY Taken	Date Stuck	Pots Stuck	Liner Cost	Comments	Scrap
7/17/12	21,250	7/18/12	21,250	\$0.50	no taken qty on prop sheet 7-19-12 jsl	

Cuttings remaining to take 0	Finished Taking <input type="radio"/> Yes <input type="radio"/> No	QTY Shifted 17,003
Cuttings remaining to stick 0	Finished Sticking <input type="radio"/> Yes <input type="radio"/> No	QTY not shifted 4,247

Type: Container Temporary Card: Card ID# 73132

Fig. 2. Information for the STICK mode.

Although we now had a timeline within which to schedule our cuttings we invariably loaded the 2-week windows with too much material and the greenhouse department would not be able to complete the job. This would lead to major issues with the production departments as we would try and schedule trimming around the needs for the cuttings. We could only hold back the trimming for so long and then there would be no cuttings when the propagation crews needed the cuttings.

As we tried to become more efficient we did a Kaizen (Japanese for “improvement” or “change for the best”, refers to philosophy or practices that focus upon continuous improvement of processes) on the greenhouse propagation line. This line was installed when the new Huron greenhouse structure was built. It’s an Agronomix line with multiple stations for the crews to stick cuttings at. It was decided that groups of three people were the ideal set up for the sticking line. A “runner” was set up to take the flats of cuttings into the greenhouse on racks pulled by an electric cart. The flats were set down on the floor and the booms were set up to mist. Another runner kept the soil line full and provided the cuttings for the crews sticking. This set up a continuous flow pattern.

A board was set up by the machine with the amount of flats that need to be produced for the day. Cuttings were split up by different types and time was allocated to the types (2/peat pot, rose/barberry, etc.). All this was then tied together to establish the information we use to schedule the cuttings now. We’ve done this the past 2 years and have been able to keep better tabs on what is getting done and if we are staying on track with our expectations. We can also better monitor how long the cuttings are staying in the cooler.

With all the data accumulated and in place in FileMaker, we schedule a meeting between the Avon farm manager (me) and the Huron farm manager (Dave Geary) as well as Tom. We will scroll through the list of plants for the time frame we are in and put the cutting numbers in place. Early in the season there will be seven crews sticking. We can add or take away from that as the crew number changes. The system will automatically calculate the number of man hours needed to complete that particular crop we have scheduled. A total will appear at the bottom of the sheet and we will keep a running tab (manual) of the number of hours we have used. We will usually go 5-10% over so that there is no need for an emergency scramble in the middle/end of the week.

Card ID	Location	Plant Name	Size	Stick Date	Cat.	Needed	Taken	Stuck	Not Done	To Do	Zero To Do	Teams	Hours	
73053	Main	ROSE K.O. BLUSHING KNOCKOUT	220	7/1/12	D	965	965	1,000	0	0	6			
73131	Main	ROSE K.O. DBL KNOCKOUT				0			0		?			
73132	Main	ROSE K.O. DBL KNOCKOUT	220	7/1/12	D	21,250	21,250	21,250	0	15,000	6	5.00		
73141	Main	ROSE K.O. DBL PINK KNOCKOUT	220	7/1/12	D	6,438	6,450	6,450	-12	0	6			
73167	Main	ROSE K.O. KNOCKOUT	220	7/1/12	D	15,000	18,000	18,000	-3,000	0	6			
73196	Main	ROSE K.O. PINK KNOCKOUT	220	7/1/12	D	3,219	3,569	3,250	-350		?			
73224	Main	ROSE K.O. SUNNY KNOCKOUT	220	7/1/12	D	3,883	3,883	3,900	0	0	6			

Cuttings to Do: **15,000** Hours: **5.00**

Fig. 3. Example of partial numbers entered for a crop.

Through the course of the summer we will continue to meet until the summer softwood cuttings are done. We can enter partial numbers when needed (Fig. 3). This may occur on new items or if we don't feel we have enough cuttings available to complete the project. If we run ahead of schedule or we feel we have other crops ready we will move them forward. Unlike previous schedules we would come up with we now know when we have to stop to allow the propagation department enough time to stay ahead. This has helped all departments to better plan and schedule their work.

We are currently producing 3 million cuttings each year and sticking 25,000-30,000/day. This is done with 6-7 groups of three people and the use of two runners. One runner takes care of soil and providing cuttings for the 6-7 groups sticking and one will deal with the set down. Five people take the cuttings to supply the groups — they may assist on the “inside” if they get ahead of the sticking groups.