

## Case Study Lawn King, Inc.

**Excel** John Conner, marketing manager for Lawn King, looked over the beautiful countryside as he drove to the corporate headquarters in Moline, Illinois. John had asked his boss, Kathy Wayne, the general manager of Lawn King, to call a meeting in order to review the latest forecast figures for fiscal year 2011.<sup>1</sup> When he arrived at the plant, the meeting was ready to begin. Others in attendance at the meeting were James Fairday, plant manager; Joan Peterson, controller; and Harold Pinter, personnel officer.

John started the meeting by reviewing the latest situation: "I've just returned from our annual sales meeting, and I think we lost more sales last year than we thought, due to back-order conditions at the factory. We have also reviewed the forecast for next year and feel that sales will be 110,000 units in fiscal year 2011. The marketing department feels this forecast is realistic and could be exceeded if all goes well."

At this point, James Fairday interrupted by saying, "John, you've got to be kidding. Just three months ago we all sat in this same room and you predicted sales of 98,000 units for fiscal '11. Now you've raised the forecast by 12 percent. How can we do a reasonable job of production planning when we have a moving target to shoot at?"

Kathy interjected, "Jim, I appreciate your concern, but we have to be responsive to changing market conditions. Here we are in September and we still haven't got a firm plan for fiscal '11, which has just started. I want to use the new forecast and develop an aggregate plan for next year as soon as possible."

John added, "We've been talking to our best customers, and they're complaining about back orders during the peak selling season. A few have threatened to drop our product line if they don't get better service next year. We have to produce not only enough product but also the right models to service the customer."

### MANUFACTURING PROCESS

Lawn King is a medium-sized producer of lawn mower equipment. Last year, sales were \$14.5 million and pretax profits were \$2 million, as shown in Exhibit 1. The company makes four lines of lawn

mowers: an 18-inch push mower, a 20-inch push mower, a 20-inch self-propelled mower, and a 22-inch deluxe self-propelled mower. All these mowers are made on the same assembly line. During the year, the line is changed over from one mower to the next to meet the actual and projected demand.

The changeover cost of the production line depends on which type of mower is being produced and the next production model planned. For example, it is relatively easy to change over from the 20-inch push mower to the 20-inch self-propelled mower, since the mower frame is the same. The self-propelled mower has a propulsion unit added and a slightly larger engine. The company estimated the changeover costs as shown in Exhibit 2.

Lawn King fabricates the metal frames and metal parts for its lawn mowers in its own machine shop. These fabricated parts are sent to the assembly line along with parts purchased directly from vendors. In the past year, approximately \$8 million in parts and supplies were purchased, including engines, bolts, paint, wheels, and sheet steel. An inventory of \$1 million in purchased parts is held to supply the machine shop and the assembly line. When a particular mower is running on the assembly line, only a few days of parts are kept at the plant, since supplies are constantly coming into the factory.

A total of 100 employees work at the main plant in Moline. These employees include 60 workers on the assembly line, 25 workers in the machine shop, 10 maintenance workers, and 5 office staff. A beginning assembly line worker is paid \$10.15 per hour plus \$2.90 an hour in benefits. Senior maintenance

**EXHIBIT 1 Profit and loss statement (\$000).**

	FY2009	FY2010
Sales	\$11,611	\$14,462
Cost of goods sold		
Materials	6,340	8,005
Direct labor	2,100	2,595
Depreciation	743	962
Overhead	256	431
Total CGS	9,439	11,993
G&A expense	270	314
Selling expense	140	197
Total expenses	9,849	12,504
Pretax profit	1,762	1,958

<sup>1</sup> The Lawn King 2011 fiscal year runs from September 1, 2010, to August 31, 2011.

**EXHIBIT 2 Line changeover cost matrix.**

		Changed to			
		18"	20"	20" SP*	22" SP
	18"	—	\$2,000	\$2,000	\$2,500
	20"	\$2,000	—	\$ 500	\$1,500
Changed from	20" SP	\$2,000	\$ 500	—	—
	22" SP	\$2,500	\$1,500	\$1,500	—

\*SP denotes "self-propelled." Changeover cost includes the wages of the workforce used to adjust the assembly line from one model configuration to another.

**EXHIBIT 3 Sales data in units.**

	FY2009 Forecast	FY2009 Actual	FY2010 Forecast	FY2010 Actual	Latest FY2011 Forecast
18"	30,000	25,300	23,000	22,300	24,000
20"	11,900	15,680	20,300	23,500	35,500
20" SP	15,600	14,200	20,400	21,200	31,500
22" SP	10,500	14,320	21,300	17,600	19,000
Total	68,000	69,500	85,000	84,600	110,000

and machine-shop employees earn as much as \$17 per hour.

It generally takes about two weeks for a new employee to reach full productivity on the assembly line. After three months, an employee can request rotation to other jobs on the line if job variety is desired. At least some of the workers find the work quite repetitive and boring.

The plant is unionized, but relations between the union and the company have always been good. Nevertheless, employee turnover has been high. In the past year, approximately 50 percent of the employees left the company, representing a total training cost of \$42,000 for the year. There is also considerable absenteeism, especially on Mondays and Fridays, causing production disruptions. To handle this situation, six "fillers" are kept on the workforce to fill in for people who are absent on a given day. These fillers also help train the new employees when they are not needed for direct production work.

**PRODUCTION PLANNING**

The actual sales and forecasts are shown in Exhibit 3. Not only are the sales highly seasonal, but total sales are dependent on the weather. If the weather is good in early spring, customers will be more inclined to buy a new mower. A good grass-growing season also encourages sales during the summer.

It appears that customers are more likely to buy the high-priced self-propelled mowers in good economic

times. In recessionary periods, the bottom-of-the-line 18-inch mower does better.

The production strategy in current use might be described as a one-shift level-workforce strategy with overtime used as needed. The workforce is not always exactly level due to turnover and short-run production requirements. Nevertheless, the policy is to keep the workforce as level as possible. Overtime is used when the regular workforce cannot meet production requirements.<sup>2</sup>

The actual monthly production output and sales for fiscal year 2010 are shown in Exhibit 4. Differences between sales and production were absorbed by the inventory. If stockouts occurred, the order was backlogged and filled from the next available production run. Lawn King utilized a 30 percent carrying cost per year for inventory.<sup>3</sup>

Each June, an aggregate production plan is prepared for the upcoming fiscal year. The plan shows the level of production for each model type and month of the year. The aggregate plan is used for personnel planning, inventory planning, and budget preparation. Each month during the year, the plan is revised on the basis of the latest conditions and data.

<sup>2</sup> Overtime work is paid at 150 percent of regular time.

<sup>3</sup> This cost includes capital costs (20 percent), obsolescence (5 percent), and warehouse costs (5 percent).

**EXHIBIT 4 Units of production and sales, fiscal year 2010.**

		18"	20"	20" SP	22" SP	Overtime Hours
Beginning Inventory		4,120	3,140	6,250	3,100	
September 09	Production	3,000	3,100	—	—	—
	Sales	210	400	180	110	
October 09	Production	—	—	3,400	3,500	—
	Sales	600	510	500	300	
November 09	Production	3,000	3,800	—	—	—
	Sales	1,010	970	860	785	
December 09	Production	—	—	4,400	3,750	
	Sales	1,200	1,420	1,030	930	1,000
January 2010	Production	4,000	4,100			
	Sales	1,430	1,680	1,120	1,120	1,500
February 2010	Production	—	—	4,400	3,500	
	Sales	2,140	2,210	2,180	1,850	1,620
March 2010	Production	3,000	3,000	2,000	—	
	Sales	4,870	5,100	4,560	3,210	1,240
April 2010	Production	—	—	2,000	4,500	
	Sales	5,120	4,850	5,130	3,875	—
May 2010	Production	3,000	2,000	2,000	—	
	Sales	3,210	3,310	2,980	2,650	—
June 2010	Production	1,000		2,000	3,000	
	Sales	1,400	1,500	1,320	800	—
July 2010	Production	2,000	3,000	2,000		
	Sales	710	950	680	1,010	—
Aug. 2010	Production	2,000	2,000		2,000	
	Sales	400	600	660	960	—
Total	Production	21,000	21,000	22,200	20,250	
FY 2010	Sales	22,300	23,500	21,200	17,600	
End inventory (8/31/10)		2,820	640	7,250	5,750	
Nominal production rate/day (one shift)		420	400	350	300	

**BACK TO THE MEETING**

The meeting continued with Joan Peterson saying, "We must find a way to reduce our costs. Last year we carried too much inventory, which required a great deal of capital. At 30 percent carrying cost, we cannot afford to build up as much inventory again next year."

Harold Pinter added, "If we reduce our inventories by more nearly chasing demand, the labor force will fluctuate from month to month and our hiring and layoff costs will increase. It currently costs \$800 to hire an employee, including the lower productivity on the line during the training period and the

effort required to find new employees. I also believe it costs \$1,500 to lay off an employee, including the severance costs and supplemental unemployment benefits that we pay."

James Fairday expressed concern that a new shift might have to be added to accommodate the higher forecast. "We are already at plant capacity, and the additional units in the new forecast can't be made with one shift. I want to be sure these sales forecasts are realistic before we go through the trouble of hiring an entire second shift."

Lunchtime had arrived and the meeting was drawing to a close. Kathy Wayne emphasized that she wanted a new production plan developed soon. "Jim, I want you to develop an aggregate production plan that considers the costs of inventory, overtime,

hiring, and layoff. If your plan results in back orders, we will have to incur greater costs later in the year to meet demand. I will not allow the same stockout situation that we experienced last year." The meeting adjourned for lunch.

### Discussion Questions

1. Develop a forecast to use as a basis for aggregate production planning.
2. Develop an aggregate production plan by month for fiscal year 2011. Consider the use of several different production strategies. Which strategy do you recommend? Use of Excel will greatly save time in making these plans.