# Irrigation Design Considerations

- To meet peak crop demand (~2.5 inches per week) an irrigation system should be designed with a pumping capacity of approximately 6-7 gpm/acre.
- A pump covering 200 acres would require ~1400 gpm!!
- $GPM = \frac{453\ X\ AC\ X\ Depth}{Frequency\ (Days)\ X\ Hours}$
- Don't over demand a well with additional acreages or systems.

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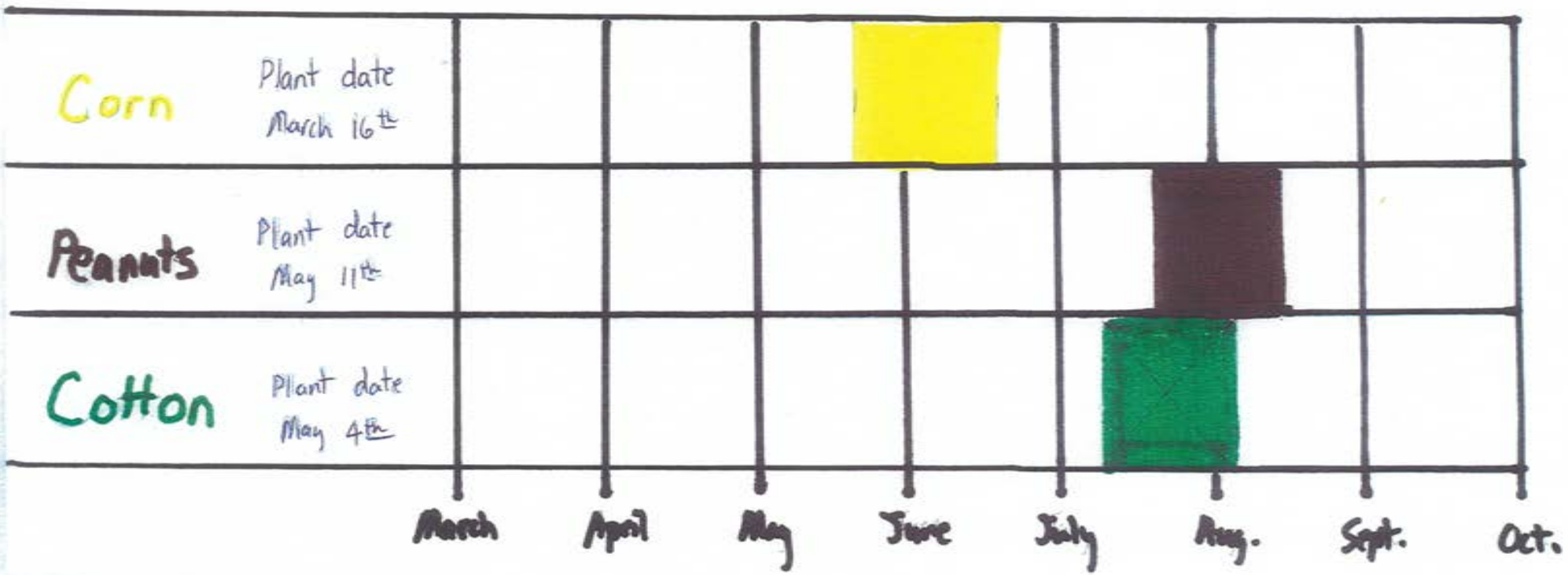
# Peak Water Demand Period Per Crop



# Real World Scenario

1. Original pivot covers 110 acres. Well flow is 600 gpm. Two years later producer decides to add a windshield wiper pivot covering 25 acres, utilizing a dry land corner on the outer edge of the original pivot. The underground pipe connecting the well to the additional pivot is sized correctly. Pivots are designed and nozzled to run 600 gpm each.

Is there enough water flow to put out a minimum of 2 inches per week if needed? If not, what is the available water in gpm per acre?

Yes or (No)

Available gpa in this final scenario 4.4 gpa

What options can be done to help deal with the shortage if there is one?

1. Split crops with corn in the rotation
2. Add another well

How many gpm would be needed in this scenario to apply 2.5 inches per week?

910 gpm

How many gpm would be needed in this scenario to apply 2.5 inches per week, but with peak electricity usage restrictions occurring 4 hrs. per day M-F?

1,040 gpm

# Calculations

600 gpm ÷ 135 ac = 4.4 gpa.

$$GPM = \frac{\frac{453 \times 135 \times 2.5''}{152,887.5}}{\frac{\text{Frequency (Days)} \times \text{Hrs}}{7 \times 24 \over 168}} = 910 \text{ gpm}$$

$$GPM = \frac{\frac{453 \times 135 \times 2.5''}{152,887.5}}{\text{Frequency} \times \text{hrs.}} = 1,040 \text{ gpm}$$

$7 \times (21)$

147

M – F Runs system for 20 hrs/day

S – S Runs system for 24 hrs/day

| | |
|---|---|
| 20 hrs | 24 hrs |
| × 5 days | × 2 days |
| 100 hrs ran | 48 hrs ran |

100
+ 48
148 total hrs for the week
÷ 7 days
21.1 hrs/day avg. run time