

Purdue Extension

Knowledge to Go

MICHIGAN STATE
UNIVERSITY | Extension

Chemigation / Fertigation

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<https://engineering.purdue.edu/ABE/Engagement/Irrigation>

<http://www.egr.msu.edu/bae/water/>

<http://msue.anr.msu.edu/resources/irrigation>

Aspects of Fertigation Planning

1. Try to match the N uptake curve for your crop
2. Beware of the N source availability. Liquid N - 28% is about ½ available immediately and rest over the next week (warmer the soil the quicker)
3. The greater the portion applied later, the lower the chance of N loss to leaching or saturated soil volatilization.
4. The greater the portion applied later, the more chance you have to reflex price change for the crop or input in the plan.
5. Sandy irrigated soils will often provide a yield bump for each additional N split. Yield bump is minimal beyond 4 splits
6. Sidedress application are still important - soil aeration and increase water infiltration

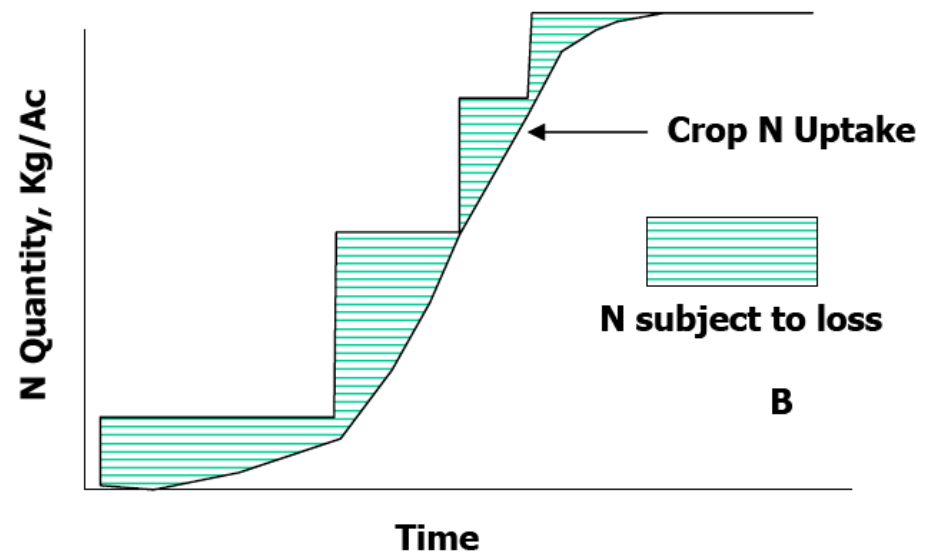
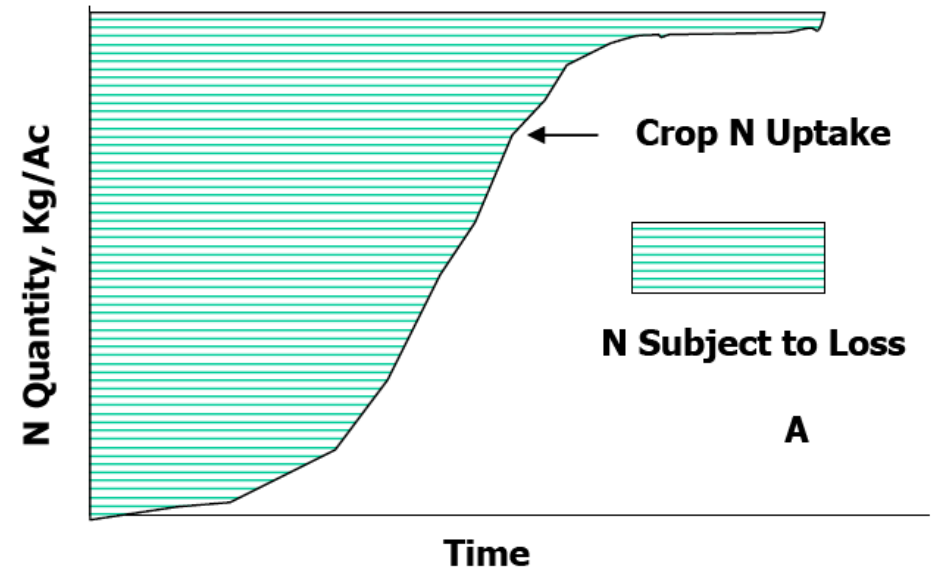
Using irrigation to get the most from pesticides and nutrients

Timely application of irrigation water:

- Improves incorporation of herbicides.
- Improves activation of herbicides.
- Improves activation/reactivation of insecticides.
- Reduces nitrogen volatilization.
- Maximizes yield to utilize the resources.

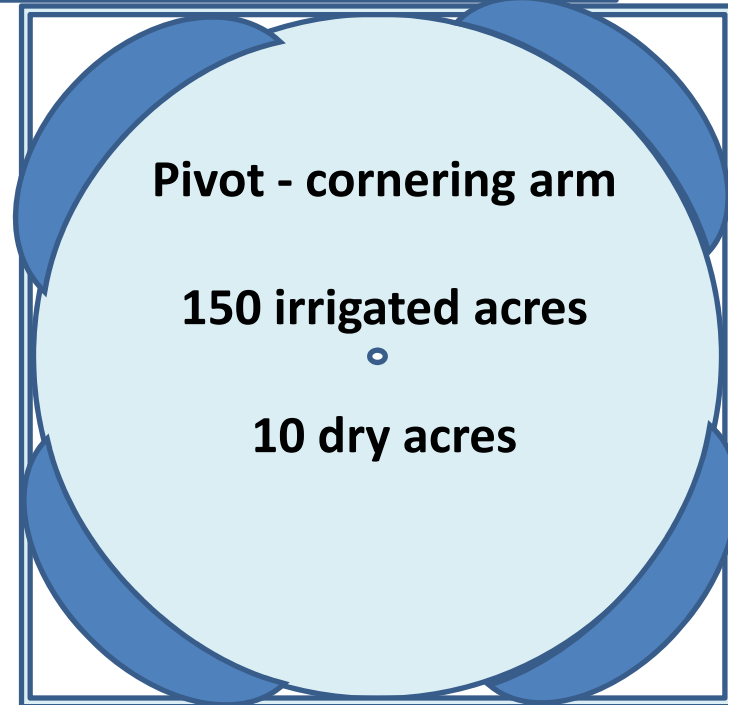
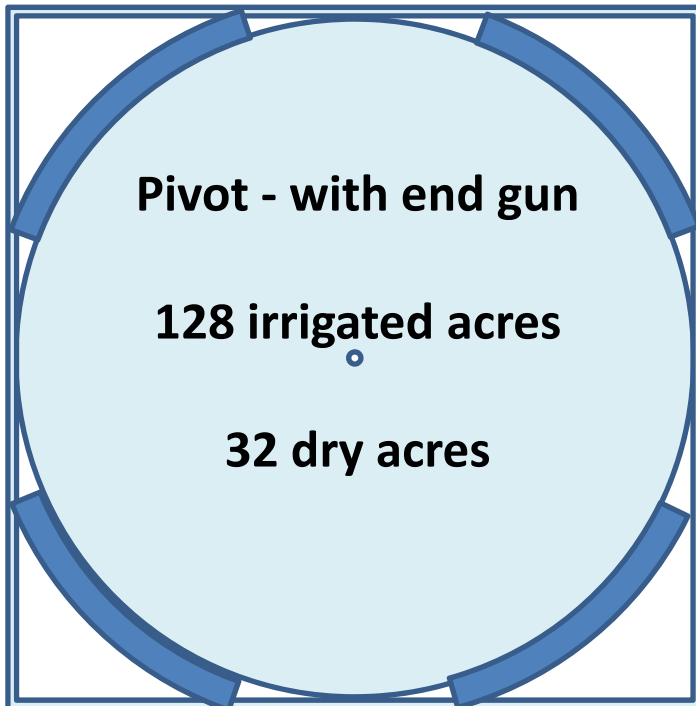
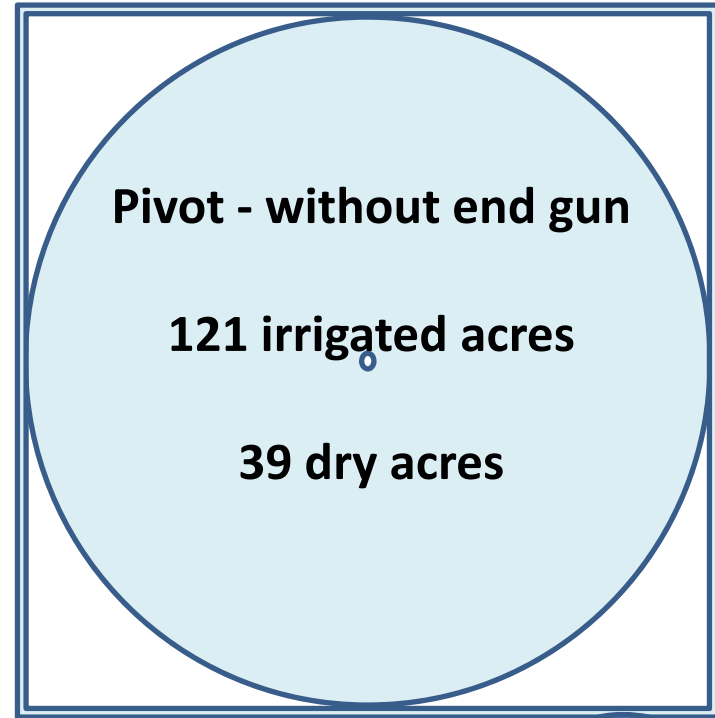
- Fertigation – Application of fertilizer via irrigation water.

- Side Dress N

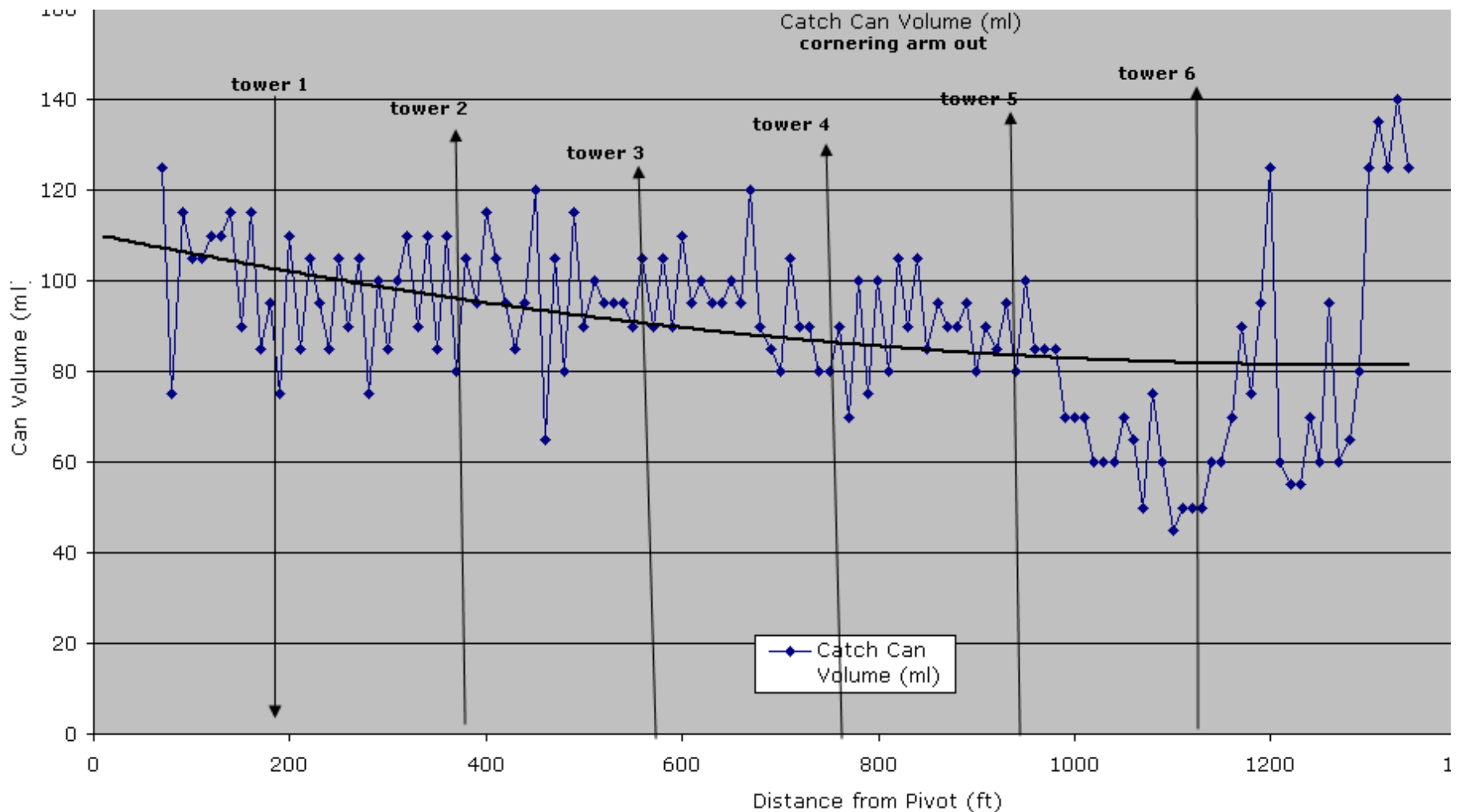


The quantity of N taken up by the crop or subject to loss from a single N application (A) or split N applications (B) (Adapted from Doerge et al., 1991).

**Use fertigation to
apply the additional
fertilizer need for the
higher expected yield
only to the irrigated
part of the field**



Uniform Water application essential for uniform fertigation/chemigation



Unless you know the uniformity of the system keep fertigation application to less than 25% of total plan.

Example N plan: 200 bu/acre irrigated commercial corn

Expected yield goal 200 bu/acre resulting in 220 lb. N recommendation

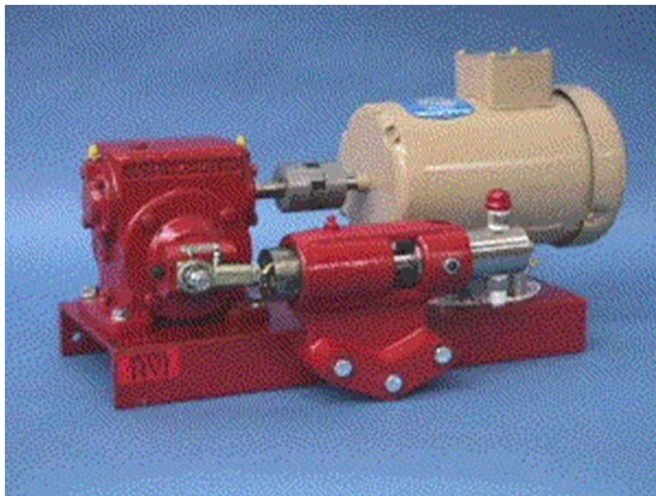
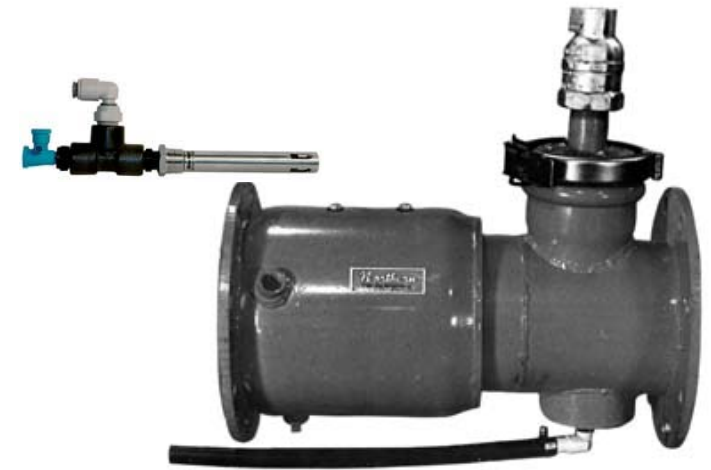
35 lbs.. in starter at planting
135 lbs.. as sidedress
50 lbs.. fertigation, 2 week prior to tassel

50 lbs.. in starter at planting
70 lbs.. as sidedress
100 lbs.. fertigation, 2 week prior to tassel

50 lbs.. in starter at planting
70 lbs.. sidedress or fertigation, knee high
50 lbs.. fertigation, waste high
50 lbs.. fertigation, 2 week prior to tassel

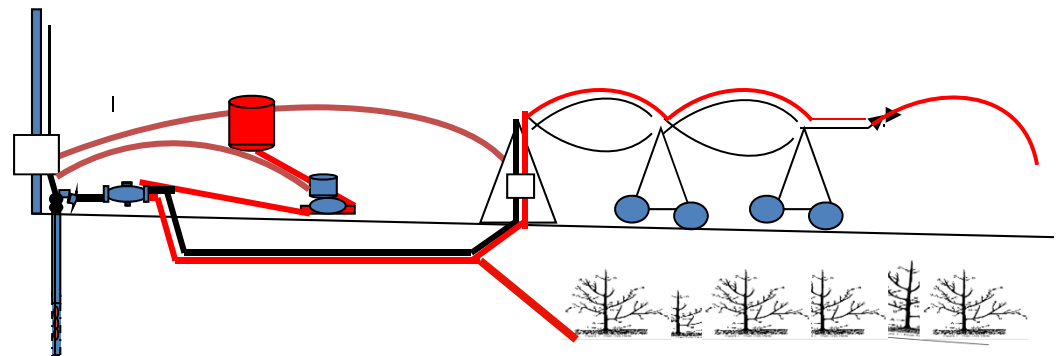
50 lbs.. in starter at planting
75 lbs.. sidedress or fertigation, knee high
75 lbs.. fertigation, 2 week prior to tassel
20 lbs.. fertigation, at tassel

Chemigation backflow valve and injection check valve



Positive displacement injection pump

Chemigation / Fertigation Systems - Safety Interlock



Chemigation/Fertigation Calibration

Monitor for calculation errors or system malfunctions.

- Shut downs
- Backflows
- Hose burst

Mark the supply tank level at start

Mark the supply tank level at $\frac{1}{4}$, $\frac{1}{2}$, and $\frac{3}{4}$ from finish

Monitor and adjust if needed, calculate and record the actual applied amount for future decisions.

Backflow situation.... Pump, Pump, Pump as soon as possible.

