

Drainage Management



Improving Watershed Design Increases Yield Opportunity

The prime objective of a successful drainage improvement plan is to remove excess water efficiently to reduce the potential for crop damage resulting in improved yields.

Drainage Benefits

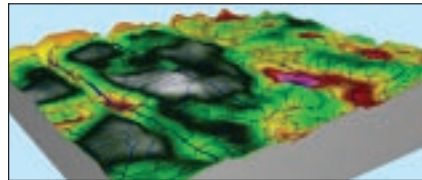
- Increased revenue per acre
- Increased crop production
- Earlier planting
- Better stand establishment
- Less root rot disease
- More uniform fields
- Controls surface water runoff without causing erosion
- Improves ability to harvest in adverse conditions
- Improved sugarbeet storage
- Better utilization of water
- Reduced soil compaction
- Less power required for field operations



Aerial Image of a field after heavy rainfall. Note the significant number of acres that have either reduced growth or areas of dead crop spread across the fields. **Properly planned drainage can reduce the economic losses in these fields.**

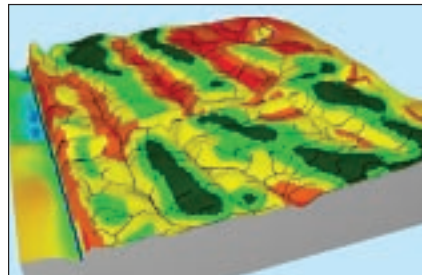
Drainage Maps

In order to maximize the drainage of surface water from your fields, a tool is needed to clearly show where water is being held and the most efficient way to drain the excess water from the field. Detailed topographic maps indicating field elevation, depression areas, watersheds and water flow paths, will help to identify problem areas. Drainage maps and software should be used in advance to determine the most effective and efficient plan for managing surface water.



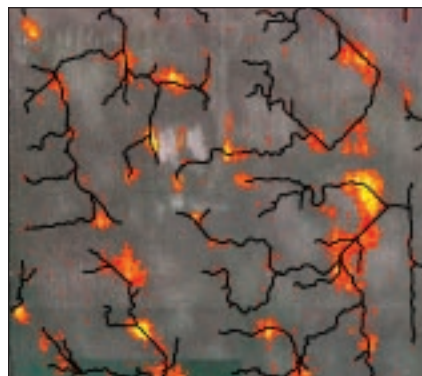
Elevation Map

The map shows different elevation areas within the fields.



Water Flow Map

Utilizing the elevation map a water flow map is developed.



Depression Area Map

Depressional area map with flow paths allows the operator to dump dirt in low spots reducing potential areas where excess water will pond.



YOUR WAY TO GROW

Fertility | Variety Selection | Stand Establishment | Weed Control | Disease and Insect Control | Harvest

Creating Topographical Maps

You can hire a precision farming provider to create the topographical maps for your fields or you can create them yourself. To do this you need:

- RTK based GPS system that has the capability to log and collect position and elevation data.
- Collection of data points during seeding, cultivation, harvest or other field operations.
- GIS software package to produce topographic maps yourself or...
- Coordinate with a mapping service provider to have the elevation, water flow and depressional area maps produced.

Drainage Calculator

American Crystal has a drainage calculator that will assist in determining how much crop production and revenue you are losing from inadequate drainage of your fields. Using a satellite image to create a drainage map will show the number of acres per zone by reflectance value that is under producing (low value = poor drainage) in each year of crop rotation.

- The calculator shows the value of improving inadequately drained portions of the field.
- Drainage maps utilize prior years' satellite imagery.
- Puts a \$ value to a field with drainage problems.
- Not a stand alone drainage tool.

Example of a field that needs drainage

Map allows input of crops in rotation, yield and price.

Acres in different crop vigor zones.

Estimation of acres in poor, average and well drained areas. Yield loss and estimated yield improvement due to improved drainage.

Estimated crop yields and price.

Estimated improved net revenue across rotation.



Tiling

Subsurface drainage may need to be considered if surface drainage does not provide results desired.

Pros:

- **Increases crop revenue**
- Less crop variation
- More timely planting
- Reduces soil erosion
- Reduces phosphate loss
- Improves water quality

Cons:

- High cost of installation \$350-\$500/A
- Increases soil infiltration
- May transport ag chemicals
- Can reduce water table



Tiled field grossed \$157/acre more than the average of three surrounding sugarbeet fields.



Sugarbeet field tiled

Sugarbeet field not tiled

For additional information contact your agriculturist or extension specialists.

Web sites:

www.crystalsugar.com
<http://d-outlet.coafes.umn.edu/>
www.precisionpartners.com/
www.ellingsondrainage.com

