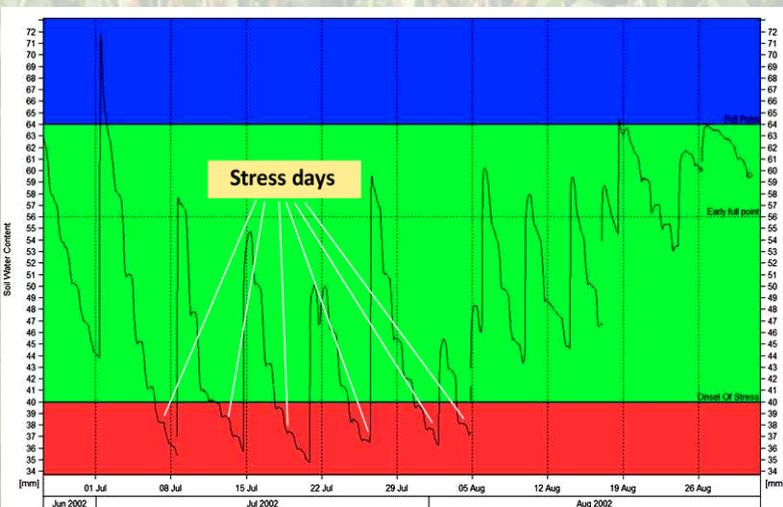


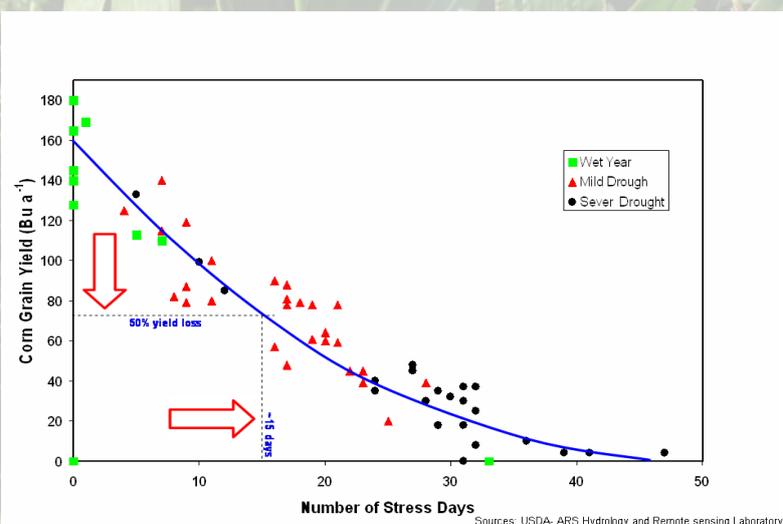
OPE3 is an interdisciplinary research project started in 1998 addressing various major environmental and economic issues facing U.S. agriculture today. Located in Maryland, USA the OPE3 sites' primary foci are the environmental aspects of precision farming. Through the use of the Sentek's EnviroSCAN technology, researchers can now identify the spatial location and timing of surface and subsurface chemical losses as they have an accurate knowledge of soil water dynamics.

Sentek installed 48 EnviroSCAN soil moisture probes with a total of 256 sensors throughout the OPE3 site. These millions of data points provide the backbone for moisture monitoring research.

One of the many outcomes from the project has been the quantification of the impact of water stress on corn yields. Even 2 days of stress can result in a 10% yield loss, which can equate to up to 40% of farm profitability.



Above: One of the 48 sites showing 15 stress days.



Above: Correlation between stress days and yield

Economic impact of too little water

The project provided 3 seasons of soil moisture data from the entire project site, which resulted in a good spread of yield and stress information. The number of stress days at each site were easily visualised from the soil water dynamics, shown in the IrriMAX software. The slowdown in rates of evapotranspiration (photosynthetic rate) were identified, and hence the period of time in crop stress.

The data clearly showed a direct correlation between the number of stress days and crop yield. 15 stress days resulted in a 50% yield reduction and even 2 days of stress resulted in a 10% yield loss.

Economic impact of too much water

In other research, the University of Nebraska-Lincoln highlighted the negative aspects of over watering. These include reduced root oxygen, increased toxicity build-up, increased negative microbial growth and root disease and less roots due to lower soil temperature. Losses of between 8-15 bushels/ average acre (\$43 -\$81 in profits) were measured due to over-irrigation by 25%.

This information is vital for corn growers in forming irrigation strategies to optimize yield and profit.