

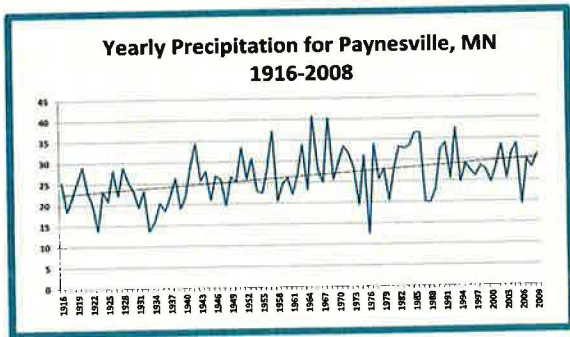
Minnesota Irrigated Agriculture

Irrigation plays a vital role in Minnesota's ag economy. 652,000 acres were reported by the DNR to be irrigated in 2017. Irrigation use is concentrated in sand plain areas including Bonanza Valley (Glenwood to Paynesville), Park Rapids, Parkers Prairie, Clear Lake, Sauk River west of St. Cloud and the Hastings area. Much of this irrigated land would be unproductive without water due to their sandy, droughty soils. With irrigation water this same land can raise corn and soybeans as bountiful as any other farmland.

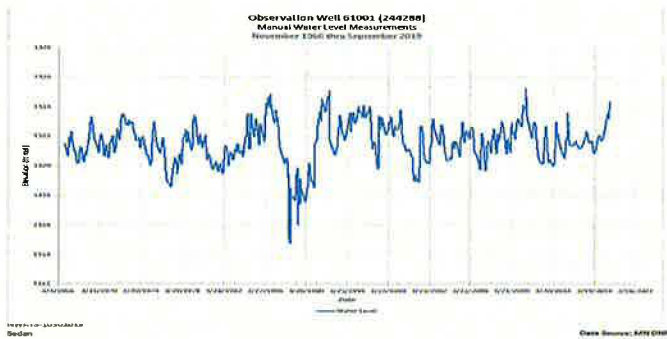
More importantly, high value specialty crops such as potatoes, sugar beets, edible beans, canning crops, and nursery stock are cultivated on more than 20% of the irrigated acreage. Canning companies such as Bird's Eye, Seneca, and Lakeside depend on these irrigated areas to provide predictable high quality raw product to process into frozen vegetables such as sweet corn and peas. Nurseries such as Baileys depend on irrigated fields to start their bare root shrubs and trees. Their barefoot fields in the Hastings area produce nursery stock worth almost \$100,000 per acre.

Irrigated agriculture has also enhanced the sustainability of many of our local communities by providing new service jobs and helping to support their community's tax base, local schools and churches.

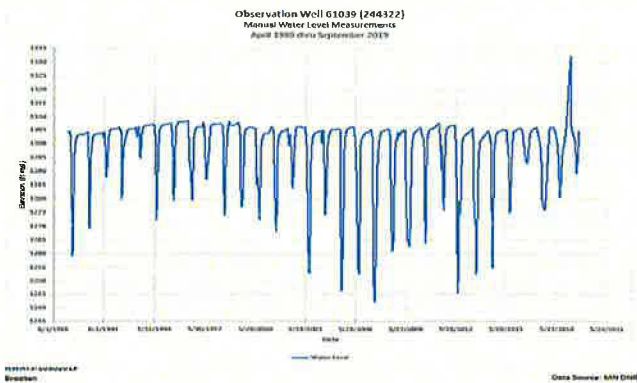
Minnesota Irrigation is sustainable.



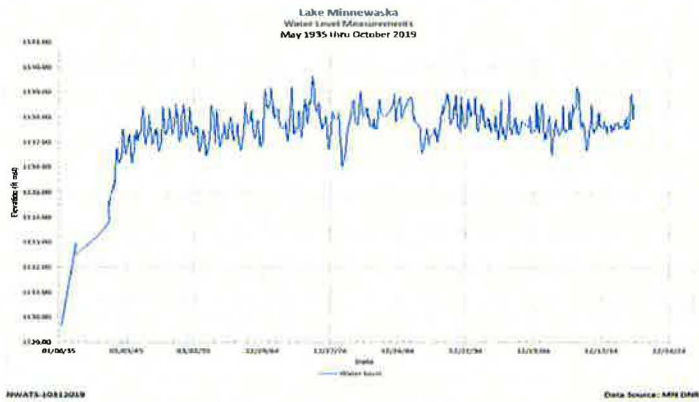
Minnesota receives almost 28 inches of precipitation annually compared to less than 15 inches in other parts of the United States where aquifer levels are declining. Over the last 100 years yearly precipitation has been increasing as shown by data recorded at Paynesville



Almost all the Minnesota DNR's observation wells show excellent aquifer recharge. This is a hydrograph of a surficial well from the Bonanza Valley area. Levels follow precipitation as noted by the lower levels in 1976 and 1988. Water levels today are higher today than 50 years ago when there was no irrigation.



Hydrographs of the buried artesian aquifer in the Bonanza Valley also show excellent recharge. Drawdowns are noted in late summer especially during drought years of 1988, 2007, and 2012 but rebound rapidly into the fall and winter. This spring water was flowing out of the top of this 123' deep observation well.



Lake Minnewaska is located on the upper end of the watershed in the Bonanza Valley. Water levels have been very stable since the 1930's when extreme year over year drought dropped lake levels over 10 feet. This was before water was used to irrigate crops in the Bonanza Valley.

Water conservation and water quality measures.

Many irrigators have chosen to become Water Quality Certified and are committed to improving irrigation practices on their farms.

Some examples of practices used to conserve groundwater:

1. Use low pressure sprinkler conversions with drop tubes, pressure regulators and rotating large droplet nozzles that minimize evaporation loss and wind distortion.
2. Irrigation scheduling using weather stations, real time moisture sensors and in-field squeeze test as well as checkbook methods utilizing daily evapotranspiration values, stage of crop growth and local rainfall amounts
3. Using cover crops to build organic matter and soil health to maximize water holding capacity.
4. Remote control of irrigation systems with phone telemetry providing quicker response to rainfall events.
5. Variable rate irrigation can be used to place water more accurately on variable soil types within a field.
6. Regular maintenance and repair of irrigation system equipment and proper management and use of end-guns.

Some examples of practices used to preserve water quality

1. Variable rate applications of seed and fertilizer according to grid sample results. Using integrated pest management to target herbicide and insecticide applications.
2. Split applications of nitrogen fertilizers to minimize waste and potential groundwater contamination.
3. Use of minimum tillage and residue management to protect land and water resources.
4. Buffer strips along public watercourses.
5. Enrollment of marginal lands into CRP and other conservation easements.
6. Participation in Conservation Security Program administered by NRCS to implement new conservation practices.
7. Utilizing EQUIP (Environmental Quality Incentive Programs) to build manure storage structures and dead animal compost facilities to protect water quality. Planting of shelterbelts, wind breaks, and pollinator habitat.

Legislative enhancements we are seeking

1. Transferability of permits.
2. Economic study of impact of any changes to permits in groundwater management areas
3. Definition of sustainability thresholds
4. Well interference resolution
5. Bill was passed by Senate in 2019 but failed in conference committee

The Irrigators' Association of Minnesota would like to thank you for your time today. We would be happy to answer any questions.