



NEWTRIENT SNAPSHOT

360 Yield Center

360 RAIN Adaptive Irrigation



BUSINESS OVERVIEW

360 Yield Center is comprised of farmers, agronomists, and engineers dedicated to developing solutions to enhance farm efficiencies, particularly in nutrient management. At the core of 360 Yield Center’s mission is meeting the needs of producers – creating innovative solutions that boost crop yields while delivering cost savings and economic returns.

PROJECT

TECHNOLOGY OVERVIEW

The 360 RAIN technology is an adaptive irrigation system that autonomously delivers water and nutrients directly to the base of crops throughout the growing season, without disturbing the crops themselves. Providing full coverage, regardless of field shape, the 360 RAIN system moves up and down the crop rows dispensing and retrieving the irrigation hose simultaneously. Real Time Kinematic (RTK) information and cellular communication control the three-wheeled electric vehicle, regulating coverage and application rate.

PROJECT SIZE

In a recent study in Wisconsin, a customized 2022 360 RAIN model used for manure application in a corn field features a 120-foot boom equipped with 35 spray nozzles (not endorsed by 360 Yield Center). The system’s speed is based on application rate, typically ranging from 1 to 8 inches per second at an average speed of 4 inches per second. With a maximum of 3,000 feet of hose, a single unit can cover up to 200 acres from a central location¹.

REQUIREMENTS

360 RAIN can blend post-separated manure effluent with other liquid sources such as wastewater, runoff, leachate, commercial fertilizers (if necessary), and well water. If sand bedding is used, sand removal from the waste stream is necessary. Manure and soils should be analyzed to optimize application rates and adhere to environmental regulations. Continuous maintenance, monitoring, record keeping, and comprehensive training are crucial to achieving maximum operational efficiency.

KEY CALL-OUTS



Water Conservation and Quality: Precise and timely water applications potentially minimize nutrient runoff and leaching into nearby surface and groundwaters.



Enhanced Nutrient Delivery: In-season manure effluent application ensures immediate nutrient availability for crop uptake.



Fertilizer Cost Savings: Optimized nutrient application reduces reliance on commercial fertilizers to offset nutrient losses.



Adaptive Irrigation: Applicable in irregularly shaped fields where traditional pivots may not be practical for operation.

Findings are based on an evaluation conducted under a Conservation Innovation Grant awarded to Newtrient. To view a more detailed description of these results, visit the 360 RAIN Adaptive Irrigation Evaluation Summary on the [Newtrient website](#).

FINANCIAL OVERVIEW



CAPITAL INVESTMENT & OPERATIONAL COSTS

As of 2025, the estimated initial capital cost of a 360 RAIN system is between \$280,000-\$300,000. Operation expenses are approximately \$82/day, equating to \$3.25/acre/pass. Maintenance costs are expected to be about \$1,200/year. Factors such as system size, capacity, market conditions, and additional features may influence these costs.



DOWNSTREAM BENEFITS

Optimizing manure application rates and delivery timing to crops during the growing season reduces reliance on commercial fertilizers, typically purchased to compensate for lost nutrients. Additionally, ensuring crops receive sufficient nutrients throughout the growing season can boost crop yields, potentially increasing farm revenue. By utilizing the 360 RAIN technology, a Wisconsin dairy reduced its purchased nitrogen by 60%, eliminated custom application costs, and achieved a 30-bushel yield gain per acre in a single growing season².

ENVIRONMENTAL IMPACT

WATER QUALITY AND SAVINGS

360 RAIN technology delivers in-season nutrients to meet crop needs, enabling the immediate uptake of plant-available nutrients from manure and potentially minimizing the risk for runoff and leaching into ground and surface waters, most particularly for nitrogen and phosphorus. By applying water and nutrients timely and precisely, 360 RAIN conserves freshwater sources. Use of separated manure effluent in irrigation reduces the need to acquire additional water.

IMPROVED SOIL HEALTH

Adequate soil moisture supplied by the 360 RAIN system supports plant growth, root development, and access to essential macro and micronutrients, while activating soil microbes. Enhanced microbial activity and nutrient mobilization increase crop availability of phosphorus and potassium. Oxygen exposure to manure oxidizes ammonia (NH₃) into ammonium (NH₄), a more plant-available and less volatile form of nitrogen³.



360 RAIN Application Within Corn Rows³

REFERENCES:

- Langolf, B., and R. A. Larson. (January 29, 2025). *Evaluation of the In-season Manure Application Using the 360Rain System*. Nelson Institute for Environmental Studies, University of Wisconsin–Madison. Final report prepared for Newtrient. Included as Appendix to *NRCS Practice Standard 590: For Acceptance of Adaptive Irrigation Technology*, <https://www.newtrient.com/about/our-work/grant-funded-projects/2020-nrcs-conservation-innovation-grant/>.
- Shearer, S.A. (2025, March 17). In-crop Applications to Improve 4R Practices Using 360 RAIN [Webinar]. The Ohio State University, https://www.youtube.com/watch?v=_D_GUeyiflQ&t=904s.
- 360 Yield Center. (2025). 360 RAIN. <https://www.360yieldcenter.com/products/360-rain/>.

NEWTRIENT'S 9-POINT TECHNOLOGY SCORING

For 360 RAIN Adaptive Irrigation

Visit the [360 Yield Center 360 RAIN](#) page in Newtrient's Solutions Catalog.



Each solution can earn up to nine points, one for each criterion. Colored numbers indicate fulfilled criteria.

- 1 | Operational History
- 2 | Operational Reliability
- 3 | Market Penetration
- 4 | Capital Cost
- 5 | Operations & Maintenance Cost
- 6 | Value Proposition
- 7 | Vendor Information Sharing
- 8 | Case Study
- 9 | Funding Availability

Discover Newtrient's technology evaluation process: [Learn more about Newtrient's 9-Point Technology Scoring System](#).



Newtrient's mission is to reduce the environmental footprint of dairy while making it economically viable to do so.

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