



## **2025 SPRINKLER IRRIGATED CORN FARM MANAGEMENT COMPETITION-ENREEC**

### **1. Description**

The 1<sup>st</sup> Annual UNL-TAPS Sprinkler Irrigated Corn Farm Management Competition will be conducted in 2025 at the Eastern Nebraska Research, Extension and Education Center (ENREEC) near Mead, NE. The competition has three awards: 1) most profitable; 2) highest input use efficiency; and 3) greatest grain yield. The winner of each category will receive a cash award. The farm management competition will host approximately 30 teams made up of individuals and groups. Each team will be assigned a “farm” comprised of four randomized plots within the same field, totaling approximately one-half of an acre. TAPS personnel will manage each farm (i.e., plots) based on participants’ management decisions. The yields and costs from each farm will be scaled to represent 1,500 acres of production, as this provides an opportunity to market an amount of grain that is more representative of a modern size farm. Participants will make a series of seven farm management decisions throughout the contest period, that include crop insurance selection, hybrid type, seeding rate, irrigation management, nitrogen management, fungicide application, and grain marketing. The production management decisions made by each team will be imposed on the individual team’s assigned plots under the variable rate center pivot irrigation system at ENREEC. All other management categories will be controlled by the TAPS team, e.g. planting date, residue/soil management, etc. These decisions will be based on best management practices and be identical across all farms. Participants are welcome and encouraged to observe, monitor, install their own equipment, and/or collect additional data from their plots throughout the growing season, but will be at their own expense and risk. Changing, modifying, adding, and/or altering any of the management protocols is not permitted and will result in disqualification and expulsion from the contest. This includes the use of additional inputs of any kind, such as fertilizers, biological, herbicides, additives, etc. For safety and logistical concerns, contestants should notify TAPS personnel (i.e., Chris, Chuck, Aaron or Vini) prior to entering the field.

Each individual/team will receive an email inviting them to access the team specific website ([www.tapsnetwork.org](http://www.tapsnetwork.org)). TAPS personnel will regularly take photos and collect data for each farm, which will also be found on the individual team website. Each farm's decisions and farm specific information will be kept until the season's end, and only available to authorized team members and TAPS personnel. Information and data that is general in nature, including plot photos, weather, crop status (e.g., growth stage advancement), and data collected by various technologies, water sensors, aerial photographs, etc., will be posted to the website, as it is collected. Supporting information, such as leaf area index, plant height, and plant nitrogen uptake may be made available to the participants as available or at the end of the growing season. In-season field tours/meetings will occur at ENREEC, dates and details will be shared prior to each event. These meetings will primarily be for updates, as well as a time for participants and program supporters to interact. The final formal gathering is the annual awards banquet, which is a celebration of the year's competitions and all those who participated and supported the program. Each competitor will have an opportunity to use innovative technology, test new methods, observe different approaches to solving similar issues, socialize, and discuss the problems, successes, and challenges of the farming business.

## **2. Competition Website**

- All participants are required to submit management information and decisions through the official website. The website address is [www.tapsnetwork.org](http://www.tapsnetwork.org). Contact Chuck at [chuck.burr@unl.edu](mailto:chuck.burr@unl.edu) or Chris at [caproctor@unl.edu](mailto:caproctor@unl.edu) with any questions or issues.
- In-season photographs of the plots, crop growth stage, and weather data, along with login credentials of commercial decision support technologies and resources will be posted on the website.
- In addition, other farm management resources, as well as contact information of the TAPS team, are available on the website.

## **3. Rules**

- Operators are encouraged to visit and observe their "Farm;" however, please notify TAPS personnel prior to entrance.
- Operators may install equipment and/or collect additional data from their plots at their own expense (with written approval from the TAPS Team). We ask that any information collected be shared with the TAPS Team.
  - o Sensors, soil samples, plant samples, etc.
- No additives, secret ingredients, additional fertilizers, or manures may be added to the plots.
- Individuals must confine their management decisions to those indicated in this document.
- Tampering or modifying any plot will result in disqualification.

#### 4. Awards

- Most Economically Profitable: \$1,500, results are rounded to the nearest \$0.01.
- Highest Input Use Efficiency: \$1,500, Water-Nitrogen Intensification Performance Index (WNIPI) (WNIPI, Lo et al., 2019). Results are rounded to the thousandth decimal place.

$$WNIPI = \frac{\left(\frac{Y_{Farm}}{Y_{Control}} - 1\right)}{\left(1 + \frac{I_{Farm}}{ET_{Control}}\right) \times \left(1 + \frac{N_{Farm}}{ANU_{Control}}\right)}$$

Where “control” is a farm managed by UNL that receives no irrigation or N fertilizer (except for 10-34-0 at planting), “ET” is seasonal evapotranspiration, “I” is seasonal irrigation, “N” is total seasonal applied nitrogen, and “ANU” is aboveground nitrogen uptake. The farm with the highest value will be determined as the winner.

- Greatest Grain Yield: \$250 to \$500, based off profitability ranking.  
Adjusted as a percentage of the most economically profitable farm. Total possible profit is the range of difference between the most and least profitable farms.  
Results are rounded to the 0.01 bu/acre (one-hundredth decimal place).

#### 5. Production Components

Each team is responsible for making the following production management decisions: cover crop termination timing, hybrid selection, population density (seeds per acre), pre-plant and in-season nitrogen amounts, irrigation quantities and timing and insecticide application. TAPS personnel are responsible for performing the physical operations and inputs. Each contestant group is responsible for knowing and abiding by all the various management deadlines and requirements. (FYI: The various management decision deadlines can be found in the “timeline” section.)

##### 5.1 Hybrid Seed Selection

- Participants are responsible for selecting their hybrid by April 10. District sales managers (DSMs) of several seed companies have provided a recommended list of hybrids and seeding rates for the competition field. Participants have the option of selecting a DSM recommended hybrid, or they can select their own hybrid and supply their own seed. If participants select a recommended hybrid, the respective DSM will provide the seed; otherwise, enough seed to plant approximately two acres is required and must be delivered to the ENREEC Office by April 10.
- Harvest will occur when the majority of hybrids are near 18% moisture content. A drying cost of \$0.04 per percentage point per bushel will be charged for moisture content above 15.5%.

## 5.2. Planting Population

- Participants will decide on the planting population (seeds per acre based on a 30-inch row spacing) by April 10.

## 5.3. Irrigation Scheduling

- The TAPS team will manage the variable rate center pivot irrigation system and execute the teams' irrigation decisions. Irrigations will be permitted every Monday and Thursday throughout the growing season except for weeks when fertigation is offered. Participants will have until 10 AM on the irrigation days to note whether they would like to irrigate, by indicating their decision on the competition website. Depths applied for a single irrigation are limited to 0.75 inch or less and in increments of 0.05 inches. The energy cost charged to each farm for pumping 1.0 ac-in/ac of water is \$6.50. Failure to use the proper form or meet the deadline will result in water not being applied until the next irrigation event. The TAPS Team may cancel an irrigation event if rainfall exceeds 0.50 inches the day prior; however, the amount of rainfall required to cancel an irrigation event is at the discretion of the TAPS Team. Notice will be provided to the teams that have scheduled irrigation in the event a cancelation is made.

## 5.5. Nitrogen Management

- Participants have two methods of nitrogen fertilizer applications available. The first method is mechanical application of N at-plant, and as a side-dress application V5/V6. This is the direct application of UAN 32% via a colter below the soil surface with each application costing \$8.50/acre custom rate cost. The second method is to fertigate during the appropriate irrigation cycle, using the same UAN 32% injected into the irrigation water at a cost of \$1.25/acre/application. The cost of N is \$0.60/lb., regardless of method. If needed, all plots will receive a uniform rate of accompanying fertilizers (e.g., phosphorus) based on pre-season soil tests. The pre-plant nitrogen decision is due by April 10 and will be applied within a few days of planting, using a coulter injected UAN 32%. Side-dress nitrogen will be applied between V4 and V6 growth stages by coulter injecting UAN 32%, and fertigation will be applied at V10, VT/R1, and R2 growth stages. Maximum application amount for pre-plant is 120 lbs/acre, side-dress is 120 lbs/acre, and each fertigation event is 50 lbs/acre (i.e., total possible fertigation amount is 150 lbs/acre). Each fertigation will be accompanied with 0.10 inches of water per 10 lbs of nitrogen. Pre-season soil report will be made available on the website in late March. If a N decision is not recorded by the deadline no Nitrogen will be applied as a default.

## 5.6. Corn Disease Management

Participants will be able to make choices that impact disease management at three points during the competition: 1) during hybrid selection, based on the disease rating for that hybrid, 2) whether or not to apply a foliar spray of fungicide at VT/R1 or R3, with a choice between four fungicide product(s). Disease management could include a variety of diseases, but based on local disease pressure history, tar spot is the most likely economically threatening disease. Disease pressure has also been observed in the field caused by gray leaf spot, northern corn leaf blight, and bacterial leaf streak at lower severity. For the foliar fungicide decision, disease severity (estimation of disease % severity covering the ear leaf) will be provided by the plant pathology research team. The timing of scouting will be immediately prior to approximately VT/R1 and R3 stages. Decisions will need to be made about whether to spray your farm, when to spray, as well as which fungicide product(s). Decisions will be due 24 hours after disease scouting. The corn pathology research team will offer a choice of four fungicide products:

- Delaro Complete (3+7+11) 8 fl oz/a \$18.50/a
- Lucento (3+7) 5 fl oz/a \$16/a
- Headline AMP (3+11) 10 fl oz/a \$11/a
- (Generic Quilt Xcel) generic propiconazole + azoxystrobin (3+11) 10.5 fl oz/a \$4.50/a

Products will be applied with a high clearance sprayer or spray drone with an application cost of \$9 per acre. The plant pathology research team will gather disease data approximately 28 days after fungicide applications.

We will base the growth stage on the reference hybrid, thus staging may vary somewhat across the hybrids offered in the project.

## 6. Economic Components

The annual TAPS budget is developed based on official University of Nebraska-Lincoln (UNL) budgets. All contestants farm operations are fixed, in terms of costs, except those that vary by productivity (e.g., grain drying costs, etc.), use of resources (e.g., nitrogen and irrigation applications, variety type and population density, etc.), and the costs of multi-peril crop insurance (MPCI). Individual budgets are available to competitors through their online portal. Costs reflected in each budget are utilized along with individual revenue data that is generated by marketing, is used to calculate each team's overall profitability. Each team is responsible for selecting an MPCI package, as well as marketing all grain produced. The complete list of the various decision deadlines is located in the "timeline" section.

## 6.1. Cost Control

All farms in the contest have the same production cost for all non-decision cost factors, (e.g., land costs, machinery costs, etc.). Each team has access to their unique budget through the website. Each decision input and yield-based cost has a listed price or per unit cost, depending on the type. The costs for variable inputs based on use, such as fertilizer, drying costs, etc., will be based on actual use or yields. Some inputs will be limited in timing, application method, and quantities, as outlined in the rules.

## 6.2. Insurance Selection

Participants are required to select an MPCCI package for their farm. This crop insurance provides the following benefits: 1) In the event of a crop shortfall, a minimum revenue or production reimbursement will become part of the profit calculation; 2) In the event of a price loss, with the appropriate insurance purchase, revenue replacement will be added into the profit calculation; 3) It provides a basis for forward contracting and creates a risk reduction for pre-selling crops prior to harvest; and 4) Allows the insurance buyer eligibility for any government payments that might accrue throughout the competition year.

The contest farm has a total of 1,500 simulated acres, which are scaled from four replicated plots. Each farm's resulting average yield is the average production of these four plots.

There are three different policy types of insurance available at 65, 70, 75, 80, or 85% level of coverage: 1) Revenue Protection (RP), 2) Revenue Protection with Harvest Price Exclusion (RP-HPE), and 3) Yield Protection (YP). A local insurer has provided premium quotes for each level of coverage for the three insurance policy types. A minimum level of 65% of an MPCCI is required.

Producers are free to choose one of two insurance package options. Enterprise Units (EU) insures all acres (plots) as a single unit. Optional Units insures each of the four plots separately, representing one third of the farm's production. This is like having four equally sized fields of 375 acres each totaling 1,500 acres. If Optional Units is selected, each field would stand alone and be indemnified based on that plot's unique yield. Participants are expected to follow sound management practices during the season including following the occurrence of a hail/wind event. If it appears sound practices are not being followed a crop insurance expert will be asked to determine if the participant would qualify for a crop insurance indemnity payment.

## 6.3. Grain Marketing

Each farm must sell its (simulated) production by November 28, 2025, or seven days after final yields are announced to competitors, whichever occurs later. As noted, the simulated production is based on the actual average plot yields adjusted to an acre basis and

multiplied by 1,500 acres. If an event occurs that results in a yield reduction the final outcome will reflect that loss, since it is calculated as the average yield of each competitor's three plots. For insurance, planning, and marketing purposes, average production history (APH) is 230 bushels per acre, making the total expected yield 345,000 bushels of grain for each simulated farm. The spring crop insurance projected price is \$4.70 /bu.

Key limitation: any speculative profits will be subtracted from total profits to estimate the farm's simulated profit, so that all farms will be judged on an equal basis.

Any contracts or sales must be reported on the TAPS website at the time of initiation, including delivery, price, time, date, and place, and/or any other conditions related to the event needed to verify and validate the price and quantity sold. Please be aware that cash or spot sales only occur after harvest, any other pre-sales of grain for an agreed upon price between two parties, aside from futures, basis, or hedge-to-arrive contracts, should be designated as a forward contract sale prior to harvest.

Remember that all transactions must be verifiable, otherwise they will not be valid. Any open futures contract will be closed automatically on the last day of the contest. A penalty of \$0.10/bu will be assessed for any open contract closed by the TAPS team.

All transactions must be completed and specified by the close of the competition. Any unsold grain will be sold at Mead's Frontier Cooperative (four miles distance from ENREEC) on November 28, 2025. All initiated contracts will be completed by November 28, 2025. Any leftover grain unsold will be charged an additional \$0.05/bu handling charge by the TAPS team. Any oversold grain will be bought back at Mead's Frontier Cooperative at the November 28, 2025, sale price with an additional handling fee of \$0.10/bu.

## **7. Marketing Guidelines**

All marketing choices will be made between April 1 and November 28, 2025. Final farm productivity is calculated based on the average of the three plots, managed according to each team's specifications. For instance, if Farm #3's average yield for the four plots is calculated to be 230 bushel/acre, adjusted for bushel weight and quality a total of 345,000 bushels are produced by the simulated 1,500-acre farm. Remember, just like any "real world" operation, yields may vary, disaster may strike, and there are no guarantees of profitability. Pre-harvest and harvest sales are available, but no post-harvest marketing is possible, due to the nature of the competition and consequential time constraints. For the purpose of this competition, teams are limited in their selection of Crop Insurance (see above).

Destinations other than Mead's Frontier Cooperative (four miles distance from ENREEC) may be used for grain sales, however, a trucking fee will be charged at \$0.005 per bushel per loaded mile

with a minimum charge of 20 miles. All simulated grain sales must specify a destination point at the time of sale. The mileage between ENREEC and the point of sale will be determined using Google Maps.

All grain marketing decisions must be properly documented to be valid. The TAPS team reviews all marketing transactions submitted through the website forms, but it is the responsibility of the user to make sure the information is properly entered and correct. Transactions that have errors will be invalidated. Transactions that are from a previous date when received will automatically be invalid. Market transactions entered on the TAPS competition website are automatically time and date stamped. Once transactions are submitted, they are ***FINAL*** and non-negotiable, and each represents a valid contract. Each transaction should include the amount of the grain being sold, the number of contracts where appropriate, where the grain is to be delivered (delivery date no later than the last day of the contest), and the particulars related to the type of sale. Sale types are limited to the five types listed below and there may be other requirements specific to the transaction type. In all cases, prices must be verified or verifiable.

## 7.1. Five Sale Methods

### 7.1.1. Spot (Cash) Sales

- This is the cash sale of grain which only occurs after harvest and before the final date of November 28, 2025, or the end of the contest.
- Required Information: Price, Bushels (Quantity), and Delivery Point (Location).

### 7.1.2. Forward Contract

- Contract cash price for November delivery at any location that offers new crop prices and any number of bushels. If more bushels are contracted than produced, due to hail, wind, etc., (i.e., if a participant cannot fill their contract), a charge to purchase the extra bushels at the November 30 harvest price will be applied, plus an additional \$0.10/bu handling fee.
  - o Required Information: New Crop Price, Bushels (Quantity), Delivery Point (Location), and Delivery Date. (Delivery is limited to post harvest.)

### 7.1.3. Basis Contract with Delivery at Harvest

- Used to set basis for number of bushels at a given location for November delivery. Price per bushel (futures price for December) is set at a different time. Once basis is set, the December futures price may be selected between when the basis contract is made and the market closing date of November 28, 2025. If no selection is made, the December corn futures settlement price on November 28, 2025, will be used. Please remember that this transaction **REQUIRES** both initiation information (basis

amount, date, and location) and completion information (futures price, date, location). Without this information grain sales value cannot be calculated.

- Basis Contract Initiation – Sets the basis for number of bushels sold at a given location for November delivery. A single contract is 5,000 bushels. As a reminder, basis in the area is usually negative, meaning that cash prices are usually lower than futures prices. (This is a December futures-based basis. Basis is, by definition, cash minus futures.)
  - Required Information: Basis price locked in (how much and where to find this price, proof that it is a valid basis price), Contract number or Quantity, and Contract Location.
- Basis Contract Completion – This transaction records the futures price selected to price the grain upon delivery. The grain seller agrees to deliver a specified amount of grain at harvest, where the contract stipulates what the cash price will be, derived from some futures price, chosen by the grain seller, and fixed by the basis contract. For the contest, all basis contracts are based on the December contract of that market year with delivery at harvest. November 28, 2025, settlement price will be used if no completion contract is initiated prior to that date.
  - Required Information: Futures Price (December 2025), Date of Original Basis Contract, and Bushels (Quantity).

#### 7.1.4. Simple Hedge to Arrive (no roll over, etc.)

- Allows the seller to lock in the futures market portion of a cash grain contract. This is usually done with the local elevator. Any number of bushels may be contracted and are tied to specific delivery point at the time of harvest. The basis will be determined at a later date. Any basis not determined before harvest will be charged at the harvest basis on November 28, 2025, with a fee of \$0.03/bu. If more bushels are contracted than produced, due to hail, wind, etc., (i.e., if a participant cannot fill their contract), a charge to purchase the extra bushels at the November 28 harvest price will be applied, plus a \$0.10/bu handling fee.
- Simple Hedge to Arrive Initiation. Sets the futures market price and delivery point.
  - o Required Information: December Contract Price, Number of Bushels, and Location of delivery.
- Simple Hedge to Arrive Completion – Sets the basis price. (This allows the calculation of the Cash Price to be received for the Hedge to Arrive Contract.)

- Required information: Date of completion, Basis Price, initiation date of Hedge to Arrive Contract and the number of bushels in the transaction.

#### 7.1.5. Futures Contract

- Due to the limitation of information and time, futures contracts will be limited to no more than 100% of APH with only one turnaround for the complete season. For example, using the 1,500 acres with an APH of 230 would only allow up to 345,000 bushels (69 futures contracts with 5,000 bushels per contract) to be sold and bought for the entire season. The contest only allows for the use of the current year's December futures contract. The initial price (short position, where futures contracts are sold) must be recorded upon sale of futures contract with the exact time and date. The offsetting (long position) price is also expected to have the same information. November 28, 2025, is the last day for any futures contract transactions. Contracts are traded in 5,000 bushels increments. Futures contracts do not set location or basis since no grain physically changes hands. The realized price is a result of the profit or loss in the futures market and the sale of the crop for a cash price. There will be a \$50 per contract transaction fee, making it \$100 to buy and sell one contract. If no offsetting futures position is made, futures will be offset on the close of futures trade on November 28, 2025, with an additional \$10 per contract closure fee.
- Futures Contract Initiation. This is the purchase of a futures contract for the right to sell grain at a specified price on the Chicago Board of Trade (CBOT) for December 2025.
  - Required Information: The futures price per bushel, number of bushels contracted (Must be in increments of 5,000 bushels), and per bushel value of the contract.
- Futures Contract Completion. For every contract sold, there must be a contract purchased to offset. These transactions will be automatically completed for any outstanding sold contract using the December futures price if not completed on the last contest day and will be assessed an extra handling fee of \$10/contract.
  - Required Information: Date the long position is initiated, futures price paid, bushels sold in increments of 5,000.
- The idea of hedging as a grain producer revolves around insuring a specific price. Futures contracts are generally thought of as a good method of protecting against a price decline. Futures contracts allow producers to make up for an expected price decline often seen during harvest. Futures requires no physical delivery but can result in gaining or losing revenue based on the timing of buying and selling of

contracts. This tool allows the producer to physically sell their production via cash or forward contract.

## 8. Timeline

### 8.1. Meetings

- Learn, Launch, Interact Event (March 17<sup>th</sup>, 2025)
  - o Rules of the competition
  - o Website Credentials
- Mid-Season Meeting I (June 17<sup>th</sup>, 2025)
  - o Update on competition and touring of field plots
  - o Sensor Presentations
  - o Technology Presentations
- Mid-Season Meeting II (August 15, 2025)
  - o This will provide a chance for participants to describe their methodology for managing “Farms” thus far and will allow competition hosts to give a status update
- Awards Banquet (January 31<sup>st</sup>, 2026)
  - o Dinner and awards (Kearney, NE)
  - o Competition summary

### 8.2. Management Decisions

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|---|--|
| - Insurance selection:  | March 31 <sup>st</sup>                         |
| - Pre-plant nitrogen amount (lbs/acre):   | April 10 <sup>th</sup>                         |
| - Hybrid selection and seed delivery:   | April 10 <sup>th</sup>                         |
| - Seeding rate:   | April 10 <sup>th</sup>                         |
| - Side-dress (V4-V6) nitrogen amount (lbs/acre):  | Based on Crop Progress                         |
| - Fertilization options available <ul style="list-style-type: none"><li>o V10, VT/R1 &amp; R2</li></ul> | Based on Crop Progress                         |
| - Fungicide: VT/RT, R3  | Based on Crop Progress                         |
| - Irrigation Management   | June to Maturity                               |
| - Marketing of Grain  | April 1 <sup>st</sup> to Nov. 28 <sup>th</sup> |

## 9. References

- Lo, T., Rudnick, D.R., Burr, C.A., Stockton, M.C., & Werle, R. (2019). Approaches to evaluating grower irrigation and fertilizer nitrogen amount and timing. *Agricultural Water Management*. 213: 693-706.

**Please contact one of the team members with any questions, or to schedule a visit to your plot. The following is their contact information:**

**All Competitions/General:**

TAPS email [taps@unl.edu](mailto:taps@unl.edu)

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