New Rockford High School Student Research Proposal Guide for the CREC

Research is conducted in a variety of scientific areas during any given season at the CREC. Topic areas available for students will depend on currently funded areas and may change from year to year.

AGRONOMY

Possible Agronomy Field Projects: Summer → Fall

- Seeding rate study – determining the effect of seeding higher or lower plant numbers per acre on yield and return on investment (various crops)
- Seed spacing study – determining the effect of seeding distance between plants on yield and return on investment (various crops)
- Biological application study – determine the effect of different biological applications on yield and return on investment (different products, rates and/or crops)
- Intercropping study – determine the effect of seeding two crops together (for example soybean and canola)

Possible Agronomy Greenhouse Projects: Fall/Spring

- Alkaloid accumulation in lupin – environment or genetic effect on accumulation

Time expectations and benchmarks:

Hands on time:

- Equivalent of 1 day per week during summer (required for agronomy field study – prefer full time student)
- 2-3 periods per day during school year
- Hands on work will be paid. Students should expect to work on additional projects to provide exposure to additional research areas. They will have help to accomplish their projects when a timeline must be kept.

Homework: One page report twice a month geared towards the final project to occur during school year (submission to mentor and school for benchmarking).

Possible Topics to be Assigned:

- Scientific Method
- Statistical Designs
- Project Background
- Project Methods
- Project Results
- Project Return on Investment
- Project Discussion

Final project: Research report suitable for publication

CROP DISEASE MANAGEMENT

Options for crop disease management projects (time frame = summer and fall):

- Quantifying the impact of planting date, fungicide seed treatment, and crop rotation interval on field pea agronomic performance in fields with elevated Fusarium and Aphanomyces root rot pressure.
- Quantifying the impact of fungicide spray volume on white mold management in soybeans and/or dry beans.

Time expectations and benchmarks:

Hands on time:

- Full-time paid work during the summer (first week of June into early/mid August)
- Approx. 3 hours/day paid work during the school year
- Contribution to all aspects of the crop disease management research program. When tasks need to be completed on the student's research project, the student will be assigned to work on that project. When there are not tasks to be done on that project, the student will be expected to do whatever tasks need to be done at that time for the full scope of the crop disease management research program.
- If the student wishes to work on the fungicide spray volume project, the student must be comfortable working around pesticides and must be available to work early mornings, late evenings, or weekends as needed when fungicide applications are made. Applications must be made when the weather and the crop growth stage are appropriate for this task.
- In the fall semester, a portion of the paid time will be dedicated to teaching the student how to analyze data and write the research report.

Homework: Instructions on writing the research report will be given in a sequentially over several weeks in the following order: (1) methods summary, (2) results summary, (3) writing the project introduction, and (4) discussion of the results. After instructions are given for writing the appropriate section, the student will be expected to work on that section as homework (non-paid time) with deadlines for completion given. The writing assignment will be reviewed by project leader Michael Wunsch, with requested edits and changes explained, and then the student will be expected to make revisions as homework.

Final project: Research report suitable for publication

Animal Science

Research is conducted year-round at the CREC. Topics would be influenced by the time of year and will vary year-to-year. Below are potential projects at the CREC-Livestock Unit.

Summer

- Finishing of yearling cattle
    - Determine performance metrics of beef steers on various feedstuffs
- Cow/Calf
    - Identify phenotypic traits of beef cattle and their relation to morbidity

Fall

- Receiving and backgrounding cattle
- Weaning calves

Spring

- Finishing cattle

Time expectations and benchmarks:

Hands on time:

- Equivalent of 1 day per week during summer (required for animal science field study – prefer full time student)
- 1-2 periods per day during school year
- Hands on work will be paid. Students should expect to work on additional projects to provide exposure to additional research areas. They will have help to accomplish their projects when a timeline must be kept.

Homework: One page report once a month geared towards the final project to occur during school year (submission to mentor and school for benchmarking).

Topics to be Assigned:

- Scientific Method
- Project Background
- Project Methods & Design
- Project Results
- Project Discussion/relation to relevant research

Final project: Research report suitable for the Carrington Research Extension Center Annual publication