
# Purdue Agricultural Centers Operating Policy

**Applicable for the following locations:**

**Davis, Feldun, Pinney, Northeast, Southeast, Southern-Indiana, Southwest, and Throckmorton (including Throckmorton-Meigs Farm, Mary Rice Farm, & Hostetler Farm)**

Updated: September 2016

**Contents**

**Background**

Within the College of Agriculture at Purdue University, operations and management expenses for applied research at the field level across the state are the responsibility of the Purdue Agricultural Centers (PACs). To enable the continuation of services that are efficient, effective, and of high quality for the diversity of the field and/or animal research at these locations, there is a need for a workable operating policy clearly defining roles and responsibilities.

The PACs operate within the constraints of a large number of unknowns including: seasonal labor, crop inputs, maintenance and replacement of equipment and infrastructure. Regional PAC administration is optimistic that the PACs can continue with facilitating high quality research in a manner that is fair, transparent, and provides the best opportunity for the acquisition of quality data from research on the land, pastures, or in confinement that is most suitable for the experimental question at hand.

Numerous experiments are carried out in the field, in greenhouses, high tunnels, or in barns/pastures at the PACs across the state. At these PACs, applied research is conducted to evaluate new pest, pathogen, and weed management strategies, production methods, as well as the development of new germplasm or crop varieties for fruit, grain, vegetable, and industrial crops. Also, the environmental impact of many of these research efforts are evaluated.
Given limited increases in state line item budget appropriations over the past decade, the PACs must still find the means to continue facilitating high quality research given current staffing levels. At the same time, the expectations on Purdue University to be both an economic driver of Indiana's economy and a provider of solutions to global challenges in food security, energy, and adaptation to climate change and other areas remain exceptionally high.

Knowing such challenges, the PACs have and should continue to maintain focus on the following:

- Applied research and outreach educational opportunities have priority.
- Graduate student and post-doc research projects have priority.
- Funded research is both a priority and an expectation.
- On-farm safety for PAC staff, faculty, staff, and student users and the public is a priority.
- Revenue through sale of rotational crops and a limited cost recovery structure is now required for the financial sustainability of the PACs.

**Mission of the Purdue Agricultural Centers: T**o provide locations and expertise across Indiana for the development of research and ideas which will benefit producers and others involved in agriculture and land use issues.

**Vision Statement:** The PACs will be managed in a way that is most appropriate for the research being conducted and in the most cost effective, safe, and efficient manner that provides high quality data, information and knowledge to appropriate clientele. The PACs at Purdue University will strive to secure preeminence in the areas of applied research and outreach education. Furthermore, the PACs should continue to generate income from row crop and/or animal operations and will utilize all available land to provide for effective and sustainable crop rotations while recognizing that some research projects may require treatments that incorporate less environmentally, economically, or socially sustainable practices for comparative purposes. The PACs will be recognized across the College of Agriculture at Purdue University and beyond for providing high quality service that is accomplished in a timely, cost effective, and professional manner consistent with the mission of the college and policies of Purdue University.

**PAC Policies**

**I. Purpose:**

The PACs will develop policies outlining the services and responsibilities of PAC staff and those of investigators who conduct research at one or more of the eight regional research farms in addition to unstaffed farms (i.e. Mary Rice & Hostetler).

**II. Rationale:**

In order for research conducted at PACs to be successful, it must be realized that this is a partnership between PAC staff and the investigator. It is imperative that there is some division of duties and responsibilities but most of all effective communication between the parties must be maintained throughout the course of field or animal studies.

The following policies describe the provided services that are managed by PACs and those that are the responsibility of the investigators.

**III. Current Infrastructure (2014):**

The PACs provide management, land, labor, facilities, and infrastructure to support field-level crops and animal production research programs located at eight locations across Indiana.

(See Appendices 3-20 for details on individual locations)

**a. Davis Purdue Agricultural Center (DPAC)**

**Size and Topography**

- 703 acres in northwestern Randolph and southwestern Jay Counties, including 522 tillable acres and 100 managed forested acres (known as the Herbert Davis Forestry Farm)
- A variety of soil types but mostly fine-textured, heavy clay soils (Blount/Pewamo series) commonly found in east central Indiana - gently rolling, hard to manage, poorly drained, low organic matter

**Heritage**

- In 1926 forestry professor Burr N. Prentice painstakingly numbered, mapped, described, and tagged every tree at this location. His work, and the work of Purdue foresters after him, have made the Davis-Purdue Research Forest the largest and oldest mapped forest in North America, resulting in its designation as a Registered Natural Landmark.

**Resources**

- Mapped timber stand
- Constructed wetland used for educational programs for landowners and K-12 educational groups
- 30+ acre field with drainage tile designed specifically for managing the seasonal water table
- GPS technology in use since the 1990s
- Equipment and resources conducive to field-scale work, rather than small-plot research

**Current Research**

- Researchers at DPAC study soil fertility, crop diseases, weed control, insect problems, site-specific agriculture, controlled drainage and drainage water analysis, old-growth timber stands/wildlife interactions, and variable-rate fertilizer applications in corn, soybeans, and winter wheat.
- The Purdue Agriculture departments involved in research at DPAC include Agronomy, Agricultural & Biological Engineering, Agricultural Economics, Forestry & Natural Resources, and Entomology.

**b. Feldun Purdue Agricultural Center (FPAC)**

**Size and Topography**

- More than 900 acres in Lawrence County near Bedford, including about 600 acres of pasture
- Limestone-derived soils characteristic of this part of south central Indiana
- Old limestone quarry and fragipan soil

**Heritage**

- Moses Fell Dunn, a highly regarded lawyer and member of the state legislature, gave 360 acres to Purdue University in 1914. The university used his gift to establish Indiana's first "experiment station" outside of Tippecanoe County.
- The Indiana Beef Evaluation Program's (IBEP) Bull Test Station at FPAC was started in November 1976 at the Pioneer Beef Cattle facility near the Town of Tipton and later moved to Purdue University's Lynnwood Purdue Agricultural Center (sold in 1988) near Carmel. It has been located at FPAC since 1989.

**Resources**

- The Indiana Beef Evaluation Program Bull Test Station, an important link between Purdue Agriculture and Indiana's beef cattle industry
- Concrete, gravity-fed water tanks downstream from pond
- Demonstration of watering systems, grazing techniques, and beef cow production practices
- New born calves annually

**Current Research**

- Research at FPAC focuses on commercial beef cattle breeding and management. Scientists in the Department of Animal Sciences use most of the pasture for a cattle herd that is part of a long-range genetics study. Other research has included studies of growth, yield, and cutting alternatives for upland central hardwoods and grazing research. Agronomic field studies with row crops are limited, with roughly 60 acres of soybeans and 140 acres of corn.
- In addition to scientists from the Department of Animal Sciences, researchers from the Departments of Agronomy, Forestry & Natural Resources, and Entomology conduct research at FPAC.

**c. Northeast Purdue Agricultural Center (NEPAC)**

**Size and Topography**

- Three parcels totaling about 444 acres, including 360 tillable acres in Whitley County between Fort Wayne and Columbia City.
- Rolling and level topography typical of northeastern Indiana, unlike any other part of the state.
- Soils are the Morley-Glynwood and the Morley-Rawson Associations, which consist of loam, sandy loam, and clay loam soils.

**Heritage**

- NEPAC is the newest regional Purdue Agricultural Center. Recognizing the agricultural importance of the northeast part of the state as well as its unique characteristics, Purdue University acquired three tracts of land for a long-awaited research center. The first tract, given in trust by Denzil Schrader in 1989, is 170 acres and is called the Schrader Farm in his memory. When Schrader convinced his neighbor Merle Kyler of the need for such a center, Kyler also gave part of his land in trust. The 85-acre Kyler Farm lies two miles to the west of the main headquarters. The third piece was a 185-acre farm one mile north of the Kyler Farm

that Purdue purchased at public auction from the estate of Harvey Lawrence, a Whitley County farmer.

**Resources**

- Diagnostic Training Center (DTC), site of annual training for Commercial Pesticide Applicators, Certified Crop Advisors (CCAs), and producers
- A pond near the office and constructed wetlands about two miles west of the office used for pond and environmental management workshops
- Timber parcels jointly managed with the Department of Forestry & Natural Resources
- Precision agricultural equipment, GPS-RTK and AutoSteer technology
- Plots of corn, soybeans, wheat, and alfalfa used for tours, special training events, and annual field days

**Current Research**

- Agricultural research conducted at NEPAC transfers more readily to area farmers than that conducted on the flat black prairie soils of west central Indiana or the soils of other regional PACs. Farmers near NEPAC want to know how a particular practice or management system is going to work on their farm. Research therefore has focused on row-crop production. Current research includes projects related to fertility; insect, weed, and disease control; corn, soybean, and canola production trials; alfalfa and canola variety trials; and tillage systems.
- Researchers in the Departments of Agronomy, Botany & Plant Pathology, Entomology, and Agricultural & Biological Engineering are currently conducting research at NEPAC.

**d. Pinney Purdue Agricultural Center (PPAC)**

**Size and Topography**

- 664 acres on the Porter-LaPorte County line, with about 560 tillable acres to serve the agricultural research needs of northwestern Indiana
- Three distinct soil types: Tracy sandy loam, which can be irrigated during dry periods for horticultural research; highly organic muck; and Sebewa loam used for corn and soybean studies
- Approximately 45 acres of woodland
- Ten acres in the USDA Conservation Reserve Program
- Pond
- Warm- and cool-season grasses native to the area

**Heritage**

- The original 486-acre farm was a gift to Purdue University in 1919 from Myra Pinney Clark and her father, William Pinney. Over the years Purdue University has acquired an additional 178 acres of adjacent farmland.

**Resources**

- Main building with meeting space for up to 50 and farm shop for equipment upgrades and repairs
- GPS-RTK technology
- Storage and drying facilities
- 30-foot by 48-foot greenhouse; two rolling high tunnels for organic research and conventional vegetables
- Linear move irrigation systems covering nearly 100 acres of tillable land
- Private Applicator Recertification Program (PARP) Testing location

- Two weather stations, for the National Weather Service and for Purdue climatologists
- Fall woodland management workshop

**Current Research**

- Research capitalizes on resources unique to this part of the state—a sandier soil and abundant water supply. Irrigation is prevalent among vegetable producers. Research at PPAC focuses on agronomic, vegetable, and specialty crops.
- Researchers in the Departments of Horticulture & Landscape Architecture, Botany & Plant Pathology, Agronomy, Entomology, and Forestry & Natural Resources currently conduct research at PPAC.

**e. Southeast Purdue Agricultural Center (SEPAC)**

**Size and Topography**

- Largest of the PACs, with 2,430 acres located six miles east of North Vernon in Jennings County
- A timber base of approximately 1,600 acres
- A variety of soil types but primarily silt loam soils common in southeastern Indiana—hard to manage, poorly drained, low organic matter
- Highly erosive soils with no-till farming practices used on most of the cropland

**Heritage**

- SEPAC was established in 1977, when the state of Indiana transferred 830 acres from the Department of Mental Health's Muscatatuck State School to Purdue University. In 2005, the Department of Natural Resources transferred an additional 1,600 acres to Purdue. The center is distinctive in its history of conservation tillage, including no-till.

**Resources**

- 1,100-square-foot conference room for education and training
- Farm shop
- Soil drainage and water quality stations
- Modern field machinery
- Pesticide-handling facility
- Equipment storage buildings
- Grain bins
- Crop sample dryers
- Walk-in cooler
- Annual hunting permits and public access for hikers, bird-watchers, mushroom hunters, etc.
- Public tours highlighting farming techniques and agriculture
- Purdue Extension Forester is based at SEPAC

**Current Research**

- SEPAC hosts practical agronomic and forestry research concentrated in pest management, nutrient management, variety performance, precision farming, soil conservation, soil drainage, water quality, forest management, and wildlife management.

- Researchers from the Departments of Agronomy, Botany and Plant Pathology, Entomology, Agricultural and Biological Engineering, and Forestry and Natural Resources conduct studies at SEPAC. Approximately 50 research projects involving more than 30 professors, graduate students, and technicians are ongoing at SEPAC at any one time.

**f. Southern Indiana Purdue Agricultural Center (SIPAC)**

**Size and Topography**

- The second-largest regional PAC, with 1,320 acres in Dubois County near the Patoka Reservoir
- Rolling ground (hilly), shallow soils, natural hard pan, not well drained, rocky outcroppings
- Difficult-to-manage sandstone and shale soils typical of southern Indiana
- Roughly 570 acres of open pastureland

**Heritage**

- SIPAC grew from a true grassroots effort by the people of southern Indiana in the late 1940s and early 1950s. Local farmers felt their environment and soil differed so greatly from farmland near West Lafayette that their counties' leadership raised funds to purchase the original parcel of farmland as well as some additional acreage. They donated the land, which was roughly half wooded and half pasture, to Purdue University – the farm was first know n as the "Southern Indiana Forage Farm." In 1965, this research farm was renamed the "Southern Indiana Purdue Agricultural Center."

**Resources**

- Conference space for 200 with high-speed Internet, kitchen facilities
- Beef herd (210) and goat herd (75 females)
- Different varieties of permanent pasture
- Fence and water systems
- Barns and traditional feedlot
- Haymaking capability
- Dennis H. Heeke Southern Indiana Disease Diagnostic Laboratory, which serves the poultry and livestock industries in southern Indiana
- Approximately 20 built ponds for erosion control and livestock
- Extension forester based at SIPAC

**Current Research**

- SIPAC is a forage-based operation (i.e. no row crops). Current research focuses on beef cattle and meat goat management, livestock grazing trials, forage and crop production, forest management, and aquaculture.
- Departments in the College of Agriculture currently conducting research at SIPAC include Agronomy, Agricultural Economics, Entomology, Animal Sciences, Forestry & Natural Resources

**g. Southwest Purdue Agricultural Center (SWPAC)**

**Size and Topography**

- 220 acres in Knox County north of Vincennes; 150 tillable acres, with about 90 used for research purposes
- Sandier soils and climatic conditions suitable for melon and other horticultural and specialty crop production

**Heritage**

- SWPAC was established in 1979, when Purdue University purchased 175 acres from Hank DeBuisseret to replace a 78-acre sand horticulture farm in Gibson County. Purdue relocated the farm to Knox County to take advantage of water availability for research and to build working relationships with Vincennes University and the USDA. The university purchased an additional 45 acres from Steve Klein in 1992. Melborn Lang, the only full-time employee to

move with the farm from Gibson County, was the first superintendent, retiring in 2008 after nearly 43 years of service to the university.

**Resources**

- Headquarters with meeting space
- Farm shop
- Greenhouses, three high tunnels, laboratories
- Horticultural coolers
- Capability of variety testing for seed companies as well as fungicide and insecticide work for agribusinesses
- Summer workforce to pick crops and collect data
- Onsite plant pathologist, horticulturist/vegetable specialist and agronomist
- Home to the Southwest Purdue Ag Program (SWPAP) and its onsite horticulturist/vegetable specialist and the Knox County Extension Office
- Vincennes University John Deere/Heavy Diesel Technology teaching facility

**Current Research**

- Although SWPAC is the smallest farm in the PAC system, it is one of the most active in research on fruits and vegetables— crops primarily grown in southwestern Indiana. Projects focus on increasing horticultural and agronomic crop yields and quality while decreasing input expenditures, including pesticides. Research includes row crop studies, weed and disease control in melons, growth and management of wine grapes, new specialty crop varieties, and organic vegetable production.
- Departments in Purdue Agriculture that currently conduct research at SWPAC include Horticulture & Landscape Architecture, Forestry & Natural Resources, Agronomy, Entomology, and Botany & Plant Pathology.

**h. Throckmorton Purdue Agricultural Center (TPAC)**

**Size and Topography**

- More than 830 managed acres five miles south of Lafayette along Highway U.S. 231 in Tippecanoe County - 567 tillable acres.
- Rolling silt loam soils at the original farm and some variation across the Meigs Farm addition.
- Two active manmade wetlands.
- 20 acres of timber used for forestry research.

**Heritage**

- Dr. George Throckmorton gave the farm to Purdue Agriculture in 1935 in memory of his father Edmund. It was deemed the “Edmund Throckmorton Farm Memorial” as a tribute to this pioneer leader of Tippecanoe County. In the late 1990s, horticultural and specialty crop research was relocated from the old Horticultural (“Hort”) and O’Neall Memorial Farms to the Meigs Farm, which is part of TPAC. The center today encompasses four separate pieces – the original Throckmorton Farm Tract, Meigs North, Meigs South, and Meigs East Tracts.

**Resources**

- Seven high tunnels in operation.
- Crops processing facility with two walk-in coolers for produce and plant materials.
- At the Meigs Farm, 145 acres set up for drip and overhead irrigation, and the site has been extensively tiled for optimum drainage.
- Five full-time employees, including a horticulture crops manager and specialty crops specialist.
- Seasonal labor.
- Twilight tours, topic-specific workshops, biannual pruning workshop.

**Current Research**

- TPAC is unique in its close proximity to campus. It is home to almost one-third of PAC-managed agricultural research projects, with current work involving 30 different crops.

Research focuses on weed management, insect management, soil fertility, agronomic crop production, ornamentals, fruit and vegetable production, biological controls, systems engineering, hardwood production, woodland and habitat management, and resistance management of weeds and insects. New areas of interest include organic and high tunnel vegetable production.

- Researchers from the Departments of Agricultural & Biological Engineering, Agricultural Economics, Agronomy, Botany & Plant Pathology, Entomology, Forestry & Natural Resources, and Horticulture & Landscape Architecture are currently working at TPAC and/or the Meigs Farm.

## IV. Responsibilities and Roles

A. Basic Services are those services provided by PAC staff that is non-project specific. Basic services provided by the PACs may include field operations to establish (e.g. tillage, plant), maintain, harvest research plots independent of experimental protocols. Many basic services are provided free of charge to investigators provided that there is a sufficient budget to cover operating expenses and/or sufficient income from the crops produced. Note: services provided by PAC staff at may differ due proximity to campus, infrastructure, available labor, facilities, and expertise. (See Appendices 3-20 for more details)

PAC staff will:

1. Select the most appropriate land for each field or animal study in order to achieve the experimental parameters of the study in question. Land will be chosen based on parameters of experiments, appropriate crop rotations, field history, soil characteristics, etc. PAC Staff will also assign projects to fields in a way that maximizes the efficiency of farm operations while maintaining the overall land management goals outlined in the vision.

2. Perform field operations such as tillage, application of lime, fertilizers, compost or other soil amendments, standard weed, insect and disease control, irrigation, and harvest in accordance with experimental protocols and objectives.

3. Plant crops in non-utilized portions of fields that will be used to generate needed income, provided such crops fit the target area and do not interfere with ongoing research projects or degrade natural resources (e.g. avoid planting in buffer zones or riparian corridors) disrupt preferred crop rotations, or compromise the system (e.g. organic, conventional, orchard plots) in which these fields reside.

4. Operate and maintain equipment, maintain grounds and manage infrastructure associated with the PACs to support the defined research and outreach mission.

5. Maintain and make available historical and current records of all farm operations for a given land area such as personnel, equipment, land, crop, cropping inputs and outputs. Particular attention will be given to regulatory projects and designated organic farmland so that research given these designations may continue.

6. Explore and adopt, when practical, new technologies for farm management, data collection and build reliable databases for future decision making.

B. Project-related expenses that are specific to meeting the experimental research objectives and are the financial responsibility of the investigator. Project related expenses include, but are not limited to, project specific supplies, treatment materials, specialty chemical and equipment that are not readily available, labor for detailed data and sample collection, as well as labor for services beyond basic services.

C. “Investigator” refers to a faculty or staff member, research scientist, Purdue Extension faculty or county staff member, or USDA-ARS scientists who provides leadership to a research or demonstration project. This term also refers to graduate students and technicians who are associated with investigator-led projects.

D. “Cooperator” refers to any other person, company representative, etc. cooperating with an investigator on research project(s) who is not an employee of Purdue University.

E. “Grant funds” are monies provided by private and public sector sponsors to an investigator or client to support the costs associated with conducting research under a contract.

F. “Protocol” is a document that describes the materials and methods to be followed in conducting field research. A protocol describes methods for application of treatments, collection of data, samples or other specific experimental-demonstration practices and may also specify the steps required to establish and maintain the experimental conditions.

## V. For the Investigator: How to Initiate and Maintain Field Research Studies

Current PAC staffing levels, infrastructure, and equipment make it necessary to plan months ahead and communicate protocols in order to be ready to prepare field areas. Since some field work can be done months prior to planting, anticipating rotational schemes, as well as the type of production systems to be used (no-till, organic, conventional, etc.), will enable better use of personnel and minimize large spikes in labor needs or equipment scheduling conflicts.

A. ALL INVESTIGATORS must complete a Project Request Form to provide basic requirements of the projected field studies to PACs through the PAC web site. Link: https://ag.purdue.edu/arp/pac/Pages/researchers.aspx.

Generalized parameters for field requests include: land prep protocol, approximate size and dimensions (acres), cropping practices to assist farm managers in planning, assigning space, procurement of general supplies, etc.

The goal is that prior to the growing season, the vast majority of field research plans are made known to PAC staff so they can more readily accommodate the last minute details, new grant monies, and other unforeseen changes that are normal occurrences during the growing season.

The project request form is not intended to function as a means to determine approval or denial of a request. Rather, the form functions to describe "what needs to happen" and then the process becomes "how we get it done."

B. PAC staff will review and make recommendations for requests of long-term field assignments of five years or longer in duration, those likely to have a lasting impact on the land or other natural resources, as well as those whose expected costs far exceed the project funding and/or expected capacity of the particular PAC(s).

C. On an annual basis, investigators shall submit project requests to the PAC(s) on or before the following dates for field plot space and assistance. For multiyear projects, there will be provisions to facilitate this as well as modifications. PAC staff understand that these investigator requests are best guess estimates of the potential research to be done. The sooner information is provided, the better the chances of successful implementation. The target dates are those needed by PAC staff to plan for the research and line up labor, equipment, and supplies. This information can be updated and refined throughout the 3 to 4 month planning season prior to planting, with decreasing likelihood of being able to incorporate the changes.

| **Planting Date** | **Target Date** |
|---|---|
| Spring-*for continuing projects* | February 15 (Implement in 2014) |
| Spring – *new projects* | March 1 |
| Late summer/fall | May 30 |

D. Each regional PAC will maintain records for all land assignments for all purposes and all land management actions performed.

E. Investigators will maintain records of all experimental treatments used on all land assigned to them.

## VI. Responsibilities of the Regional PACs and Investigators

### a. Communication

PACs: Once a field request is submitted and space is assigned, an email will be sent to the investigator confirming receipt of request. Included will be a map of the assigned space. Priority in space assignments will be given to those investigators who attend PAC day on campus meeting(s).

### b. Tillage

PACs: The PACs will provide general tillage operations to provide an acceptable seed bed to establish crop test plots.

Investigator: Project specific equipment that is not in the PAC inventory must be provided by investigator, or investigator must cover expense of renting or retrieving such equipment.

### c. Staking and Plot Layout

PACS: The PACs will maintain field boundaries and assist in measuring the location of research plots within fields to establish boundaries for space assignments. PAC staff will provide field markers as needed to mark corner boundaries and document these boundaries in the PAC farm database.

Investigator: Investigators are responsible for providing flags, wooden garden stakes or other identification markers for individual treatments. They shall reimburse or replace inventory of markers used from individual PAC inventory when used. Investigators should use fiberglass flags rather than wire since there have been problems with broken wire flags puncturing tires. If subplots require operations performed by PAC staff, it is recommended to use flags on subplot corners.

### d. Fertilizer and Crop Protection Products

PACs: The PACs will maintain appropriate soil fertility conditions for bulk crops (i.e.: N, P, K, soil pH). They will provide applications of fertilizer and crop protection products (herbicides, insecticides, fungicides, etc.), and maintain optimal soil fertility. In keeping with the principles of integrated crop management, purchased inputs will be minimized and used in the most economically efficient and environmentally beneficial way. Unless, otherwise specified by the investigator's protocol, PAC staff will apply products according to labeled rates utilizing Purdue Extension recommendations and/or their experience with a particular field, area of the PAC, or the availability of VRT-generated maps.

Investigator: Materials which are treatment-specific are the investigator's responsibility to provide and dispose of excess materials. Investigator is responsible for providing organic matter inputs such as manure, compost, or legume cover crops across the entire area of an experiment depending on the research needs (organic vs. conventional production systems) and specialized application equipment if not available from the PACs equipment inventory, or cover costs for modifying existing equipment to meet experimental objectives or renting equipment.

### e. Seed and Greenhouse Transplants

PACs: The PACs will provide seed for rotational crops, using hybrids and varieties of their choice - the regional PAC superintendent may coordinate procurement of needed agronomic crop seed that is commercially available.

Investigator: Investigators are responsible for providing specific seed varieties, transplants, nursery stock, and other plant material for research experiments. Maintenance and care of transplants in greenhouse, hardening shelters, and excess transplants are the responsibility of the investigator.

### f. Planting

PACs: The PACs will assist in the planting of experimental plots where specialized equipment that is under their management is utilized. For some studies, this will include incorporation of drive rows within the plot area. PAC staff will inform investigators on potential dates for planting dependent on weather and field preparation.

Investigators: Investigators are responsible for providing necessary staff, plot map, seed/transplants and supplies to assist with the planting. Investigators should be in communication with PAC staff prior to planting for target dates for optimal planting of experiment.

### g. Weed Control

PACs: The PACs will provide uniform weed control across an experiment that follows requirements of a particular crop and production system. Mechanical cultivation may be provided for specialty crops where it is customary practice and/or where chemical controls are not available, registered, or effective. PAC staff shall make every effort to maintain weed-free test plots, unless otherwise noted, across all production systems provided sufficient budget is available to hire seasonal labor. PAC staff may assist in trimming ends of test plots to a common length through mechanical cultivation, herbicide application, mowing, harvesting alleys and the ends of plots with machinery or by planting cross rows depending on the experiment.

Investigator: Investigators are responsible for the application of experimental treatments. Investigators shall provide all experimental materials, supplies and equipment to apply experimental treatments unless previously arranged with PAC staff.

### h. Fungicides and Insecticides

PACs: PACs staff will provide and apply fungicides and insecticides (and other crop protection products as needed) to control pathogens and pests uniformly across experiments according to labeled rates, established economic thresholds, forecasting models, and experimental protocols. PAC staff will scout crops for insects or diseases, but not on individual treatments and/or field studies.

Investigator: Investigators are responsible for the application of experimental treatments. Investigators shall provide all experimental materials, supplies and equipment to apply experimental treatments unless previously arranged with a PAC superintendent.

### i. Data/Sample Collection

PACs: In general, data collection is the responsibility of the investigator. Any requests for assistance from PAC staff with data or sample collection must be discussed when project requests are submitted.

Investigator: Investigators are responsible for collection of data and samples of data and/or samples for their projects.

### j. Irrigation

PACs: PACs may set up irrigation equipment and apply irrigation water upon request provided irrigation equipment and water supply are available. Working with researchers and PAC administration, specific PACs will continue to maintain existing irrigation delivery capacity.

Investigators: Investigators shall provide materials and equipment to apply irrigation water for trickle, mist irrigation or fertigation systems for their projects, or to experimental units within projects. When irrigation equipment and water is not sufficient for all PAC land or fields, the distribution will be based on the priorities noted on page 4. Investigators shall provide staff guidance and assistance in removal and storage of trickle irrigation systems at the end of the harvest season.

Investments in irrigation equipment will be through a partnership between the PAC(s), the investigator and/or others that may benefit. Previous investments in wells and pipe were made by investigators and departments.

### k. Harvest

PACs: Agronomic Crops: PACs will provide labor and equipment to assist with harvesting crops from test plots where GPS-controlled equipment is utilized to record yield (gross weight), moisture, and collect samples during the operation of agronomic crops harvest.

Horticultural Crops: PAC staff will assist with harvesting of horticultural crops when there is sufficient temporary labor to do so. At specific PAC locations, temporary employees may be hired in the late summer/fall to assist with harvest of fruits and vegetables. The Investigator hires, supervises, and manages their temporary harvest employees.

Investigators: Investigators and staff are responsible for collecting detailed harvest data, preparing detailed samples, making selections of breeding material and collecting seed or seed lots during harvest. Investigators shall advise managers of harvest schedule for coordination purposes.

For horticultural crops, investigators should budget for specialized harvest containers which are not in a particular PAC inventory. Disposal of samples not taken to campus will be coordinated with each PAC superintendent.

For biomass crops, investigators should budget for specialized harvest equipment and containers which are not in a particular PAC inventory. Disposal of samples not taken to campus will be coordinated with each PAC superintendent.

### l. Woody Horticultural Crops (e.g. tree fruits, grapes, brambles)

Due to the long term nature of fruit crop experiments, requests for establishing new projects should be made prior to submitting funding proposal, to determine if the necessary land is available. Once these details have been agreed upon, study/plot plans are required to be submitted to the PAC office and particular PAC superintendent at least nine months in advance of expected planting date to allow sufficient time for site preparation. The PAC(s) invest significant resources to establish and maintain fruit crops to maturity. As a result, decisions on the removal of established plantings require careful consideration. These may include costs and returns of continued operations, whether the planting is needed by other investigators for grant funded research, whether land is needed to establish new fruit projects, etc. PAC staff will consult with the

PAC Office on campus on such decisions. To provide the most opportunity for research, blocks of trees that are differing ages (nonbearing trees, and established bearing trees) are typically maintained. This allows for more opportunities for investigators to establish projects and increase their ability to attract graduate students and receive grants. However, who or how these non-assigned blocks would be funded and maintained shall be reviewed annually.
PACs: PACs will assist in the establishment and maintenance of research orchards, vineyards, brambles, etc. The costs of specialized operations which require significant labor to implement must be supported financially by the investigator.

Investigators: Investigators are responsible for establishment costs including nursery stock, trellis, additional drainage, irrigation, etc. Investigators are responsible for costs to implement pruning, training, data and sample collection, and specialized crop management practices.

**m. Organic Farming Research**

Due to the regulatory constraints imposed by the National Organic Program (NOP) rules and approved certifiers, additional efforts are required to maintain research on certified organic land.

PACs: In order to maintain certified organic land, the PAC superintendent(s) will ensure that all PAC operations on certified and transitioning land are conducted in accordance with the NOP rules. This includes the proper management and cleaning of equipment, and maintaining daily logs of operations conducted on organic land.

Investigators: The investigators will be responsible for the annual certification of fields designated for organic farming research. They will collect and maintain the necessary records required for the certification of organic land and have a representative present during inspections. The investigator will be responsible for ensuring that all inputs purchased and used on organic research land are approved by the local certifier before application. Investigators will also be responsible for keeping and uploading records related to input purchases as required by the local certifier and NOP rules.

## VII. Disposition of Harvested Crops

The PACs will be responsible for sale and marketing of crops. Income from sale of crops will be deposited into income-expense accounts of the particular PAC to cover operating expenses. Crops not fit for human consumption due to the application of experimental materials shall be incorporated into the soil or destroyed. Crops that could legally be consumed but are determined to be unmarketable due to substandard quality shall be donated if feasible, incorporated into the soil, or destroyed if donation is not feasible.

Donations of research crops to charitable organizations such as food banks, homeless shelters, or other emergency food supplies will be coordinated by the PAC superintendent and the Investigator, if any, responsible for their production.

## VIII. PAC Facility Use and Assignment Policy

**a. Assignment of Plot/Study Space to Investigators:**

PACs: For all studies, the best land to achieve the experimental parameters of the study will be chosen based on the design of experiments, appropriate crop rotations, field history, soil characteristics, etc. PAC staff will strive to enhance efficiency of operations by assigning projects to fields such that similar types of projects and/or crops are in proximity to one another.

Investigators: It is imperative that investigators provide as much detail as possible on the type of experiment, length of time the experiment will be conducted, potential resources, labor issues, plans for planting, data collection and harvest, crop destruct, or marketability to allow for the best decision possible in placement of the study.

**b. End of Experiment:**

Investigators: It is the investigator's responsibility to inform the appropriate PAC superintendent of the anticipated completion date of the project at the beginning of the project. Investigators are responsible for removal of data and sample collection devices and restoration of the site if substantially altered from its original state, including but not limited to the removal of flags, large stakes, data collection devices, bug traps. These should be outlined more specifically.

PACs: PACs will return the land involved in completed projects to conventional or organic rotation or assign it to another project. For perennial crops, the PAC office and particular superintendent will assess the long term viability of maintaining the crop based on potential for future research by Purdue staff or USDA-ARS investigators, and if the plot could be maintained in a cost-neutral plan.

**c. Revocation/Expiration of Assigned Space:**

PACs: PAC superintendents will inform the PAC Office of concerns related to overall field utilization. Field plots/studies that have not been maintained as outlined in the Project Request Form show clear signs of neglect, and mismanagement, or those activities that will have a long-term negative impact on the land will be reviewed first by the regional PAC Office and, if deemed necessary, brought to the attention of campus-based PAC administration.

Investigators: Unexpected issues arising from the loss of staff, loss of funding and personal life issues, not to mention weather events, can impact the success of field studies. It is imperative that investigators work issues out with PAC superintendent/PAC Office to avoid any long-term negative consequences on the PACs and neighboring experiments.

**d. Assignment of Building Space**

Certain spaces in farm buildings were previously assigned to investigators to support specific programs. It is the intent that programs be able to continue to occupy space related with farm research activities. The PACs will manage areas used for short-term and long term storage and collaborate with investigators on the most efficient use of these areas. If programs which occupy assigned space discontinue, then space will revert to the PACs. Investigators should make requests for long term use of building space to the PACs. With limited space available, these requests will be reviewed as they arise. An investigator/research program will be responsible for construction costs, maintenance and utilities related to new buildings and/or site modifications funded in part or wholly by a research program.

## IX. Appendices

### Appendix 1: PAC Field Day & Event Information

### Field Day & Event Organization & Planning

As noted previously, educational outreach activities (e.g. field days, events, workshops, tours, etc.) are a priority at all eight PACs and departmental farms and forestry properties in the College of Agriculture at Purdue University. PAC superintendents, staff, and PAC administration will work closely with field Extension staff and others to effectively plan and implement successful events. PAC superintendents need be involved with any event planning and decision making when such events are to be held at their particular PAC. PAC superintendents will provide guidance and leadership with event issues including but not limited to: usage of meeting room(s) or areas, tour routes, people mover usage, etc. For larger events like annual field days, it is imperative that area Extension staff for a particular PAC meet, organize, plan, and promote in a timely fashion that leads to effective event programming.

### Guidelines for Use of People Movers/Trams at all PAC and Woodland Events in the College of Agriculture

The guidelines noted below must be adhered to when transporting event attendees at the PACs. These guidelines were developed by a college-level PAC safety committee and approved by the Director of Agricultural Research at Purdue University (ARP)/Associate Dean of Agriculture in April of 2009.

- Only commercially available people movers will be used to transport groups of people at PAC events.
- The tractor/vehicle operator must be a Purdue employee who is familiar with the equipment he/she is operating – this includes the people mover and the hitching mechanisms involved.
- PAC/Woodland staff shall review travel routes prior to event. Routes taken should be void of sharp turns, inclines, unnecessary backing, and other potential hazards.
- A Purdue employee (e.g. PAC or Extension staff member) shall review transport safety information with attendees on a people mover prior to departure. If at all possible, a Purdue staff member shall remain on a people mover to monitor safety and answer any questions or concerns during transport.
- PAC staff must take the lead to ensure the safe loading/unloading attendees in addition to the balanced seating and total number of persons per mover.
- Direct communication must be established between the tractor/vehicle operator and a person of authority on the people mover during transport. Warning light indicators in the tractor/vehicle and/or two-way radio contact are examples of such communication.
- Loaded people movers shall not be transported at speeds in excess of 8 miles per hour.
- Loaded people movers in transport at PAC/Woodland events shall be restricted only to crossing public roads. Limited public road travel is a necessity at several PACs – when such transport is required, a lead university escort vehicle with appropriate flashing lighting will be required. There must be direct communication between the operator of the escort vehicle and the operator who is pulling the people mover.
- Annual training by PAC Office staff and others with pertinent expertise will be undertaken and involve all PAC staff and others involved in the transportation of individuals. As needed, PAC Administration will update Cooperative Extension field staff and others in the College of Agriculture who are also involved in events and activities at the PACs/Woodlands.

## Appendix 2: Unmanned Aerial Vehicle Operations at the PACs

The primary use of unmanned aerial vehicles (UAVs) at the PACs and supporting farms (Mary Rice and Hostetler) is for agricultural research and education, but other students, faculty, staff, and outside entities can use PAC space with permission from PAC superintendents and, if needed, the Office of the Purdue Agricultural Centers.

The purpose of this policy is to specify the rules for UAV operation and the procedures for obtaining permission to fly at one or more PACs.

- Rules
- Procedure for Permission to Fly
- UAV Vehicle Safety Data
- Flight Operations Procedure
- Accident Report Form
- Summary of FAA Part 107 Rule (see Appendix 1)

**Rules - Per August 29, 2016 FAA Part 107 Update**

- Maximum weight: <55 lbs.
- Maximum altitude: 400 ft. above ground level
- Maximum speed: 100 mph (87 knots)
- All flight activity over one of more PACs must have approval from PAC superintendent(s)
- Daylight Operations only
- An experienced and certified* Pilot in Command (PIC) and at least one visual observer (VO) are required for all flights – the need for a VO does exceed FAA requirements
- UAV must yield to any and all manned aircraft
- Aircraft always within line of sight of the PIC and VO
- If used, a safe spectator area must be designated
- Cannot not fly over or close to PAC staff, university personnel, or others
- Entry over another's field study must be done with permission (PAC superintendent and, when applicable, researcher)
- Emergency Procedures
    - Call 911 for police, fire, or rescue response
    - Immediately contact the PAC superintendent
- In the event of a crash, the recovery protocols are:
    - Outside PAC Boundaries
        - Obtain owner's permission before trespassing on their property
    - Within PAC boundaries
        - If it is inside another study area, obtain PAC superintendent permission before recovering
        - If it is within the designated flight area(s), recover all pieces and debris
    - Lost within high corn or other vegetation.
        - Mark the area of the crash and contact the PAC superintendent
    - In all cases, file an accident report with the PAC superintendent
- In the event of "loss of Link" for a manual controlled UAV, it must go to "fail safe" mode and circle over PAC property until the link is recovered or power runs out.

- In the event of a "fly away" of an UAV under autopilot control:
    1. Take manual control through the radio control transmitter
    2. Take manual control through Ground Station Control
    3. Initiate loss of link strategy by circling over PAC property until the link is recovered or power runs out

* - See FAA Rule – Part 107 for Pilot in Command certification and responsibilities

# PAC UAV Vehicle Safety Data

Name:_____ Phone_____ Email:_____

Purpose of UAV operation

_____

_____

| | |
|---|---|
| Name of PIC; (Pilot-in-Control)& cell # | |
| UAV MANUFACTURER & MODEL | |
| UAV CONTROLLER MANUFACTURER & MODEL | |
| FLIGHT DURATION | |
| GROSS TAKEOFF WEIGHT | |
| Wing Span | |
| ENGINE TYPE CHOICES:<br>1) Electric, 2) Air/Fuel Combustion | |
| FUEL VOLUME | |
| IF USING FUEL, FUEL TYPE:<br>1) Gas/Oil mix, 2) Gas, 3) Propane, 3) Kerosene | |
| POWER SYSTEMS (any that apply & indicate voltages):<br>1) Ni-Cad, 2) Lithium, 3) Nickel-Metal Hydride | |
| MANUAL CONTROL OPERATING FREQUENCY | |
| HOW CONTROLLED? (radio operated control or autonomous flight) | |
| AUTOPILOT OPERATING FREQUENCY | |
| VIDEO DOWNLINK FREQUENCY | |
| OTHER DOWNLINK FREQUENCIES | |
| MISSION PROFILE<br>1) Max operating altitude (ft.) (400 ft. is the max)<br>2) Max operating range (ft.) | |
| A/C MAX SPEED | |
| OPERATOR TRAINED? (yes, no, or trainee) | |
| UAV FLIGHT HISTORY | |
| PILOT FLIGHT HISTORY | |
| OTHER ITEMS | |

Note: Include a picture of the aircraft.

# PAC UAV Flight Operations Procedure

Before flying, complete form below and present to PAC superintendent. Check with PAC superintendent and other on-site faculty/staff to ensure that flying activity will not conflict with other UAV operations in the flight area.

DATE _____

Name:_____ Phone_____ Email:_____

Purpose of this UAV flight operation

_____

_____

Do you have permission to fly at the _____ - PAC

Over what regions within the PAC will you be flying _____

_____

What is your estimated start time _____ finish time _____

Pilot In Command _____ Cell # _____

Visual Observer _____ Cell # _____

# Accident Report

**PAC UAV Operation**

Pilot In Command:_____ Phone_____ Email:_____

Date: _____ Time: _____ Location: _____

Weather conditions:

_____

Equipment: _____

Personnel on site, and duties during flight:

_____

_____

Description of accident:

Cause of accident:

Remedial actions to prevent future accident:

Date: _____ Signature: _____

**Appendix 1:**

# FAA News

Federal Aviation Administration, Washington, DC 20591

June 21, 2016

## SUMMARY OF SMALL UNMANNED AIRCRAFT RULE (PART 107)

| | |
|---|---|
| **Operational Limitations** | • Unmanned aircraft must weigh less than 55 lbs. (25 kg).<br>• Visual line-of-sight (VLOS) only; the unmanned aircraft must remain within VLOS of the remote pilot in command and the person manipulating the flight controls of the small UAS. Alternatively, the unmanned aircraft must remain within VLOS of the visual observer.<br>• At all times the small unmanned aircraft must remain close enough to the remote pilot in command and the person manipulating the flight controls of the small UAS for those people to be capable of seeing the aircraft with vision unaided by any device other than corrective lenses.<br>• Small unmanned aircraft may not operate over any persons not directly participating in the operation, not under a covered structure, and not inside a covered stationary vehicle.<br>• Daylight-only operations, or civil twilight (30 minutes before official sunrise to 30 minutes after official sunset, local time) with appropriate anti-collision lighting.<br>• Must yield right of way to other aircraft.<br>• May use visual observer (VO) but not required.<br>• First-person view camera cannot satisfy "see-and-avoid" requirement but can be used as long as requirement is satisfied in other ways.<br>• Maximum groundspeed of 100 mph (87 knots).<br>• Maximum altitude of 400 feet above ground level (AGL) or, if higher than 400 feet AGL, remain within 400 feet of a structure.<br>• Minimum weather visibility of 3 miles from control station.<br>• Operations in Class B, C, D and E airspace are allowed with the required ATC permission.<br>• Operations in Class G airspace are allowed without ATC permission.<br>• No person may act as a remote pilot in command or VO for more than one unmanned aircraft operation at one time.<br>• No operations from a moving aircraft.<br>• No operations from a moving vehicle unless the operation is over a sparsely populated area. |

| | |
|---|---|
| | • No careless or reckless operations.<br>• No carriage of hazardous materials.<br>• Requires preflight inspection by the remote pilot in command.<br>• A person may not operate a small unmanned aircraft if he or she knows or has reason to know of any physical or mental condition that would interfere with the safe operation of a small UAS.<br>• Foreign-registered small unmanned aircraft are allowed to operate under part 107 if they satisfy the requirements of part 375.<br>• External load operations are allowed if the object being carried by the unmanned aircraft is securely attached and does not adversely affect the flight characteristics or controllability of the aircraft.<br>• Transportation of property for compensation or hire allowed provided that-<br>o The aircraft, including its attached systems, payload and cargo weigh less than 55 pounds total;<br>o The flight is conducted within visual line of sight and not from a moving vehicle or aircraft; and<br>o The flight occurs wholly within the bounds of a State and does not involve transport between (1) Hawaii and another place in Hawaii through airspace outside Hawaii; (2) the District of Columbia and another place in the District of Columbia; or (3) a territory or possession of the United States and another place in the same territory or possession.<br>• Most of the restrictions discussed above are waivable if the applicant demonstrates that his or her operation can safely be conducted under the terms of a certificate of waiver. |
| **Remote Pilot in Command Certification and Responsibilities** | • Establishes a remote pilot in command position.<br>• A person operating a small UAS must either hold a remote pilot airman certificate with a small UAS rating or be under the direct supervision of a person who does hold a remote pilot certificate (remote pilot in command).<br>• To qualify for a remote pilot certificate, a person must:<br>o Demonstrate aeronautical knowledge by either:<br>▪ Passing an initial aeronautical knowledge test at an FAA-approved knowledge testing center; or<br>▪ Hold a part 61 pilot certificate other than student pilot, complete a flight review within the previous 24 months, and complete a small UAS online training course provided by the FAA.<br>o Be vetted by the Transportation Security Administration.<br>o Be at least 16 years old.<br>• Part 61 pilot certificate holders may obtain a temporary remote pilot certificate immediately upon submission of their application for a permanent certificate. Other applicants will obtain a temporary remote pilot certificate upon successful completion of TSA security vetting. The FAA anticipates that it will be able to issue a temporary remote pilot certificate within 10 business days after receiving a completed remote pilot certificate application.<br>• Until international standards are developed, foreign-certificated UAS pilots will be required to obtain an FAA-issued remote pilot certificate with a small UAS rating. |

| | |
|---|---|
| | A remote pilot in command must:<br>• Make available to the FAA, upon request, the small UAS for inspection or testing, and any associated documents/records required to be kept under the rule.<br>• Report to the FAA within 10 days of any operation that results in at least serious injury, loss of consciousness, or property damage of at least $500.<br>• Conduct a preflight inspection, to include specific aircraft and control station systems checks, to ensure the small UAS is in a condition for safe operation.<br>• Ensure that the small unmanned aircraft complies with the existing registration requirements specified in<br>• § 91.203(a)(2).<br>A remote pilot in command may deviate from the requirements of this rule in response to an in-flight emergency. |
| **Aircraft Requirements** | • FAA airworthiness certification is not required. However, the remote pilot in command must conduct a preflight check of the small UAS to ensure that it is in a condition for safe operation. |
| **Model Aircraft** | • Part 107 does not apply to model aircraft that satisfy all of the criteria specified in section 336 of Public Law 112-95.<br>• The rule codifies the FAA's enforcement authority in part 101 by prohibiting model aircraft operators from endangering the safety of the NAS. |

**Appendix 3: Crop Budgets (utilizing 2012 data)**

| | Non Chemical Equipment, Supplies & Labor | Chemical Equipment & Labor | Fertilizer & Chemical | Total Labor | Total Crop Cost |
|---|---|---|---|---|---|
| Tomatoes/ Peppers Conv | $ 955.21 | $ 505.21 | $ 1,292.84 | $ 433.21 | $ 2,753.25 |
| Tomatoes/ Peppers Org | $ 969.86 | $ 237.46 | $ 127.50 | $ 394.81 | $ 1,334.82 |
| Melons/ Pumpkins Conv | $ 888.83 | $ 505.21 | $ 1,289.93 | $ 433.21 | $ 2,683.97 |
| Melons/ Pumpkins Org | $ 903.49 | $ 435.34 | $ 320.63 | $ 402.69 | $ 1,659.45 |
| Sweet Corn | $ 247.86 | $ 175.77 | $ 337.16 | $ 127.20 | $ 760.79 |
| Intensive Sweet Corn | $ 247.86 | $ 452.81 | $ 693.32 | $ 138.22 | $ 1,393.99 |
| Carrots Conv | $ 563.66 | $ 289.86 | $ 570.19 | $ 244.68 | $ 1,423.72 |
| Carrots org | $ 578.32 | $ 289.86 | $ 379.68 | $ 254.07 | $ 1,247.86 |
| Onions | $ 694.22 | $ 369.01 | $ 850.45 | $ 374.39 | $ 1,913.69 |
| Apples | $ 572.04 | $ 848.53 | $ 1,315.41 | $ 797.40 | $ 2,735.98 |
| Grapes | $ 45.99 | $ 493.92 | $ 336.84 | $ 193.28 | $ 876.75 |
| Corn | $ 182.00 | $ 21.99 | $ 236.43 | | $ 440.42 |
| Soybeans | $ 163.29 | $ 12.96 | $ 56.30 | | $ 232.55 |
| Wheat | $ 117.78 | $ 6.48 | $ 62.42 | | $ 186.68 |
| BioMass | $ 71.44 | | $ 59.00 | | $ 130.44 |

**Appendix 4: Throckmorton/Meigs Equipment List**
**Bold items are primarily at Meigs Farm**

**TRACTORS/POWER EQUIPMENT**

- **Case IH Farmall 766, 30" rows, 85 hp**
- Case International 5288, 160 hp
- Case International MX110, 100 hp, 30" rows, creeper gear
- **Farmall 130 HC, 22 hp, belly hooded sprayer, 5', 30 gal**
- **Farmall Cub, 11 hp, mounted cultivators**
- **Ford 1920, 29 hp, front fence line/tree row sprayer boom, 30 gal**
- Ford New Holland 8770, 212 hp, no row crop work, RTK Autosteer
- **John Deere 2955, 85 hp, 30" rows, loader, brush bucket**
- John Deere 4250, 120 hp, 30" rows, RTK Autosteer
- **John Deere 5210, 45 hp, 30" rows, RTK Autosteer**
- **John Deere 5520N, 75 hp, orchard**
- **John Deere 6400, 84 hp, 30" rows, narrow tires, RTK Autosteer**

**HARVESTING/MOWING EQUIPMENT**

- Brush Hog Batwing, 10', 12'
- Case IH 5088, 260 hp, 6-30" corn head, 20' grain platform, RTK Autosteer, Yield Monitor
- Gandy Air assist spreader, variable width 20" spacing, 16' max
- Hiniker Flail chopper, 6' w/ dump cart
- **John Deere 609, 6' Bush Hog**
- John Deere Bush Hog, 5'

**SPRAYING/APPLICATION/CULTIVATION EQUIPMENT**

- 28% liquid side dresser, 4 or 6 x 30"
- 3pt 16.5' sprayer, 250 gal
- **3pt Herbicide Sprayer, 20' 20" nozzles or 22' 30" nozzles, 60 gal**
- 6 x 30" row crop cultivator
- **Century 3pt, 42', 20" nozzle spacing, No Herbicide, 500 gal**
- Century 45' pull type, 20" nozzle spacing, 28%N application, 750 gal
- **Cosmo Model P Spreader**
- **Environment Tree row sprayer, 35" hood**
- **Frontier MS1108 Spreader**
- **John Bean 458T Airblast Sprayer, 375 gal**
- John Deere rotary hoe, 15'
- Miller 4215 Nitro, 60/90' boom, 15" nozzle spacing, 1000 gal, RTK light bar, VRT
- **Organic 3pt, 33', 20" nozzle spacing, ORGANIC ONLY, 500 gal**

**PLANTING/BED PREPARATION EQUIPMENT**

- JOHN DEERE 750 Drill, 15', 7.5" row spacing, small seed grass box, VRT
- John Deere 7200 MaxEmerge Planter, 6x30", 2"x2" & popup liquid starter, 20/20 seed sense monitor, VRT
- **John Deere Model 71, 3pt plate planter, 2 row, adjustable**
- **Mechanical Transplanter Co. Model 85 Plastic layer, 3-4' plastic, flat bed**
- **Rainflo 345 plastic layer, 3-5' plastic, flat bed**
- **Rainflo Bed 2550 Shaper/Mulch Layer, double tape, fertilizer**

- **RainFlo Waterwheel Transplant, 2 x 12”, 2 x 18”, 24”, 36” spacing**
- **RJNT No-Till Transplanter, irrigation tape**

**TILLAGE EQUIPMENT**

- **Great Plains RTR 2570 Tiller, 70”**
- **Howard HR20 Rototiller, 80”**
- International 6 x 18” Plow
- John Deere 714 Chisel, 15’
- Kent 5000 Field Cultivator, 22’
- Sunflower 1233 Disc, 18’

**IRRIGATION EQUIPMENT**

- **Buckeye 4737 Mulch Lifter, winder**
- **Irrigation Solid Set**
- **Irrigation Tape Retriever**
- **Irrigation-Engine #1**
- **Irrigation-Engine #2**
- **Kifco Water Reel Irrigation Gun, 2” pipe**

**SHOP/MISC. EQUIPMENT**

- 4000# capacity fork lift
- 5000# capacity crane
- **BCS Walk Behind Tractor, 33” Berta Flail Mower, 26” Tiller ORGANIC ONLY**
- Case 1085B Excavator
- Case W14C Pay loader, 1.75 yd bucket
- John Deere 1210A Auger Cart, 400 bu, scales
- **Kawasaki 3010 Mule, scales**
- **Kubota 900XT, hydraulic post pounder, automated soil sampler, GPS equipped**
- **Kubota RTV 400, scales**
- Polaris Ranger UTV
- Weight wagon, 5000# capacity

**Appendix 5: Throckmorton/Meigs Horticulture Crops Capacities, Recommendations, and Responsibilities**

These apply to all horticulture crops grown at Meigs and general farm operations

Total conventional plot area is limited to approx. 17 acres each growing season to allow for sufficient crop rotation

Plot locations will be assigned by farm according to available space, and plot needs with preference given to those who attend TPAC/Meigs day on campus

Land request form is required before space allocations can be made

Multi-year studies require a land request form annually

Suggested minimum row length if using plastic mulch and irrigation is 50+ feet, this allows for more efficient equipment operation and bed formation

**FARM RESPONSIBILITY**

- Applications and Equipment Operation
    - Tillage, bed formation, planting, non-treatment spraying, cultivation, non-treatment fertilizer application, final plot clean up (mowing and plastic/irrigation removal)
- General crop scouting
- Non-treatment Irrigation management
- Plot border management (mowing, spraying, tillage)
- Equipment service and maintenance will be performed by farm staff (time, parts, and materials will be billed to investigator for investigator-owned equipment)
- Farm developed fertilization and pest management practices of vegetable crops will be based on Extensions Specialist and *Midwest Vegetable Production Guide for Commercial Growers* Purdue Extension ID-56 recommendations.
- Farm developed pest management practices of fruit crops will be based on Extensions Specialist, *Midwest Small fruit and Grape Spray Guide* Purdue Extension ID-169, and *Midwest Tree Fruit Spray Guide* Purdue Extension ID -168.
- Soil test will be performed fall prior to vegetable plot establishment using a ½ acre soil type grid
- Soil pH will be managed at 6.5 level based on fall soil testing
- Vegetable plot fertilization will occur using 2 practices one base on soil test results, second based on crop grown
    - Broadcast application using variable rates to maintain uniform P and K levels sufficient for soybean production per A & L Great Lakes Laboratories, Inc. recommendations.
    - Band application of N, P, and K fertilizer in plot areas according to ID-56 recommendations for crop grown
- Maintain perimeter fence
    - Gates will be closed at 5 p.m. each work day during the growing season.
- Maintain adequate supply of hand tools (hoes, shovels, rakes, etc.)
- Maintain field operation records of task performed by farm staff
- Maintain farm applied pesticide application records and notification as required by WPS

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Plot maps and specific management practices
- Necessary marking of sub plots

- Provide funding for pesticides used in plots
    - Active and non-active research plots
- Transplanting labor (2+ people)
    - Funding or people
- Treatment supplies, application labor, and management
- Specialized Equipment (sensors, traps, plot harvesters, etc.)
- Staking and tying supplies and labor of crops if needed
- Initial plot clean up (pulling stakes, post, flags, twine, pulling plastic and tape if needed, etc.)
- Sample and data collection/analysis
- Provide seed and growing media if farm is producing project transplants
- PI responsible for closing fence gates after hours, weekends and in the off season
- Hand weeding of plots
- Return and clean hand tools to the designated area
    - Organic designated tools are stored in Organic barn
    - Non-Organic designated tools are stored in Meigs barn
- Provide farm staff with all regulation guidelines associated with crops grown
- Inform farm staff of field operations performed by PI
- Inform farm staff of pesticide applications performed by PI (farm will forward information and notify other farm users as required by WPS

***Fruit Tree/Grape Capacities, Recommendations, and Responsibilities***

In addition to the Meigs capacities, recommendations, and responsibilities, these listed below also apply to fruit tree and grape plantings at the Meigs Farm location

Tree fruit planting area is limited to Fields G1, H1, and east half of C1 (approx. 20 acres total) to allow for rotation of vegetable crop plots

Grape planting area is limited to field G2 (approx. 8 acres)

**FARM RESPONSIBILITY**

- Manage irrigation on plots less than 3 years old
- Manage rodent control
- Oversee pruning of fruit trees as agreed upon with PI
- Oversee bulk tree fruit harvest during normal business hours

**PI RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Provide funding for tree stakes
- Provide additional labor for planting (2+ people for plots < 100 trees, 4+ people for plots 101-250 trees, 6+ people for plots > 250 trees)
    - Funding or people
- Provide additional labor for pruning (4-6 people during Feb-Apr, 1-2 people during summer)
    - Funding or people
- Oversee bulk tree fruit harvest after hours and weekends

### *Organic Vegetable Capacities, Recommendations, and Responsibilities*

In addition to the Meigs capacities, recommendations, and responsibilities, these listed below also apply to organic vegetable plantings at the Meigs farm location

Organic area is limited to Fields B2 (approx. 8 acres) and O (approx. 10 acres). Plot area within this varies with the amount and type of research being performed each year. Generally See Field Management for B2 and Field O Guideline for more details

**FARM RESPONSIBILITY**

- Maintain equipment and field operations record as required by NOP Standards
- Maintain farm purchased input records, labels, search records as required by NOP Standards
- Maintain crop rotation as described in the Field Management for B2 and Field O Guideline

**PI RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Maintain investigator-purchased input records, labels, search records as required by NOP Standards
- Maintain clean organized working area in Organic Barn as determined by farm staff

### *High Tunnel Recommendations and Responsibilities*

In addition to the Meigs capacities, recommendations, and responsibilities, these listed below also apply to studies conducted in high tunnels, low tunnels, or other 'protection' or 'season extension' structures

Current high tunnel assignment is performed by farm staff with preference given to investigators involved with purchase and funding of structures

**FARM RESPONSIBILITY**

- Perform necessary maintenance and repair
- Irrigation infrastructure
- Initial plot preparation (tillage, tomato trellis, bed preparation)
- Final plot clean up (trellis post and wire removal, tillage)
- Maintain 24 hour/day water supply and access

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Provide funding for necessary maintenance and repair supplies and labor
    - Current occupant of tunnel will be billed for repair and maintenance supplies of individual tunnels
- Environment control (ventilation, temperature) management and application
- Provide funding for fertigation equipment
- Irrigation and fertigation management and application
- Final plot preparation (planting, staking)
- Initial plot clean up (removal of plant material, plastic mulch, irrigation tape, twine)
- Provide additional labor for major repairs (recovering) as requested by farm

*Greenhouse Operations and Responsibilities for Meigs/TPAC*

**FARM RESPONSIBILITY**

- Maintain adequate greenhouse facilities to produce healthy transplants for field production
- Provide necessary plug trays, fertilizer
- Maintain pest control, watering, and fertigation practices
- Seed crops in a timely manner in accordance with project needs

**Conventional Transplant Production Methods**

- Greenhouse temperature 75° F
- 72 round plug trays
- Growing Media (subject to change)
    - Sungro Redi-Earth Professional Plug and Seed Mix
    - 55-65% Canadian Sphagnum peat moss, vermiculite, dolomite lime
- Watered as needed with fertigation water
    - 20-20-20 at 200 ppm

**Organic Transplant Production Methods**

- Greenhouse temperature 75° F
- 72 round plug trays
- Growing Media
    - Sunshine Natural and Organic No2 N&O (subject to change)
    - 75-85% Canadian Sphagnum peat moss, perlite, dolomite lime

      or
    - Lambert 100% Organic Potting Mix
- Watered as needed
- Fertilize weekly
- Organic BioLink 3-3-3
    - 2 Tbsp. per gallon

**Organic Isolation Procedures**

- Plants are separated by space on a separate bench, across the aisle or if quantity allows in an adjacent greenhouse.
- Tray tags are marked as “ORGANIC”.
- Water is delivered by a dedicated hose and hydrant, organic hose is blue, conventional hose is black
- Organic fertilizer is contained in separate bucket with a sealed lid
- Potting benches are sweep clean when changing from conventional to organic potting media.

Vehicles used to transport transplants to field are swept clean prior to transporting organic transplants

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Provide necessary seeds and media needed for seedling production
- Provide farm staff with time line for production

***TPAC/Meigs Equipment Service and Repair***

**FARM RESPONSIBILITY**

- Perform necessary preventive maintenance, service, and repair equipment (farm and PI owned)
    - Investigator will be billed for labor, parts, and materials
        - Labor will be billed on actual time used
- Provide parts, repairs, supplies and hardware used on farm owned equipment
- Maintain adequate supply of general shop supplies (common fasteners, lubricants, cleaners, rags, safety supplies, necessary tools) needed for day to day operations.

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Provide necessary manuals, diagrams, and layouts requested by farm
- Report any issues or breakdowns with equipment ASAP to farm staff
- Inform farm staff is equipment needs service or work

**Appendix 6: Field Management of Organic Research Area at Throckmorton/Meigs**

The following management strategy developed for the Organic areas (Fields O and B2) at the Meigs Farm accomplishes several common goals; builds the soil fertility, reduces weed production, evens out plot cause variations, and limits the financial impact on total farming operations. The rotation builds soil fertility with the help of cover crops that either fix nitrogen or make other nutrients more available. Using fast growing, high biomass producing cover crops, different soil and vegetation management methods, weed growth and seed production will be reduced i.e. tillage, mowing. This rotation also tries to even out any previous research affects that might cause abnormal variation in soil properties with the use of grid soil sampling and applying soil amendments only to problem areas. All these goals are reached by limiting the negative financial impact on the farm with the incorporation of wheat into the rotation.

This management strategy has very few nutrients leaving the system. Total nutrient removal with grain and straw removal is 82, 12, 82 lbs. Nitrogen (N), Phosphorus (P), and Potassium (K)per acre respectively, grain harvest removes 42, 8, 10 lbs. N, P, K per acre respectively. This is assuming a 40 bushel per acre grain yield and 1.5 ton per acre yield. Legumes in the rotation add 100+ lbs. of Nitrogen (N) annually and when manure is applied an additional 150+lbs. N 70+ lbs. P and 90+ lbs. K are added when manure is applied.

Grid soil sampling will be performed using ½ acre grids the fall prior to seeding wheat. Deficient areas will be identified and necessary applications of Rock Phosphate and Sulfate of Potash will be made to bring soil levels up to a uniform level according to A & L Great Lakes Laboratories, Inc. soil test results. Applications of manure obtained from the ASREC will be applied at 8-10 tons/acre over non-plot area if soil test results are medium or less on 50% or more of the sample points. Soil pH will be maintained at 6.5 based on soil samples used for fertility testing.

The rotation will be split with Field B2 beginning on Year 1 and Field O beginning on Year 2 of the Crop Rotation Cycle. This Rotation cycle will begin the fall of 2013. In the fall of 2012 the non-research areas in Field O will be moldboard plowed and left fallow over the winter. Alfalfa will be seeded in the spring of 2013 per Kevin Gibson's request/plans and then begin the Crop Rotation Cycle outlined below starting with wheat in the fall of 2013.

**MANAGEMENT GOALS**

Increase soil fertility
Suppression of weed growth and productivity
Remove any research caused plot variation

**RESEARCH AREA PROTOCOL**

Research Areas can be obtained for either spring or fall planting seasons

Any area that is released from long term (greater than one year) research must be maintained in the bulk area management for at least two rotation cycles (4 years) before being eligible for research again.

Short term (1 year) research areas can be obtained after year 1 of rotation for fall seeded crops or year 2 of rotation for spring seeded crops. After research is concluded, these areas must be maintained in the bulk area management for at least one rotation cycle (2 years) before being eligible for research again.

An area released from research, will be deep tilled (deep chiseled or subsoil) and returned into the rotation cycle at the point of the surrounding area.

**BULK AREA MANAGEMENT**

Bulk area will be rain fed, due to lack of man power and equipment
Cover crop seeding rates will be determined from *Managing Cover Crops Profitably.*

**CROP ROTATION CYCLE**

Yr. 1 Fall-planted Wheat, frost seeded red and sweet clover summer-seeded sorghum x sudangrass
Yr. 2 Fall-planted Hairy Vetch/Rye mowed prior to seed set followed by summer-seeded buckwheat
Yr. 3 Research or back to year 1

Wheat

*(Moldboard plowed and disc prior to drilling, harvested and grain sold with other farm wheat, straw can be baled if not weedy. Manure applied prior to final seed bed preparation if needed)*

- Allows farm to recoup a portion of cost
- Easy to grow organically
- Easy to market

Red/Sweet clover

*(Frost seeded, mowed with rotary mower after wheat harvest as needed to prevent weed seed production)*

- Easy to establish
- Gives continuous cover growth after wheat harvest
- Nitrogen fixation of 100+ lbs.
- Potentially free P and K (Sweet clover)

Summer seeded Sorghum x sudangrass

*(No-till drilled into standing clover the end of July; Mow 9-12" using flail mower as needed to prevent weed seed production)*

- No-till into frost seeded clover
- Quick growth and alleopathic properties suppresses weed growth
- Capture N from clovers
- Easy to terminate
- Grows in high temp when clovers can struggle
- High biomass producer

Fall planted Hairy vetch/Rye mix

*(Disc clover Sorghum x sudangrass prior to drilling if weed populations are significant, otherwise no-till into flail mowed 0-1" height cover)*

- High biomass production (Rye)
- Weed suppression through vegetative growth and alleopathic properties (Rye)
- High N fixation 150+ lbs. (Hairy vetch)
- Easy to establish
- Easy to terminate
- Early spring growth
- Commonly used with growers

Summer seeded Buckwheat

*Drill into worked seeded bed if perennial weeds are problem, otherwise no-till into mowed hairy vetch/rye cover prior to seed production of either crop. After buckwheat sets seed, lightly disc to allow for reseeding and another cycle. If perennial weeds become problematic, Moldboard plow after first buckwheat crop and manage a stale seedbed until wheat planting)*

- Weed Suppression through quick growth
- Easy to terminate
- Potentially frees P and K
- Capture N from Hairy vetch
- Fast decomposition
- Short growth cycle

**Flail mowing procedure**
Mow at designated height allowing residue to be spread uniformly on the ground
**Rotary mowing procedure**
Mow using batwing mower at 3-4” in height letting residue fall where it may

**Appendix 7: Throckmorton/Meigs Agronomic Crop Responsibilities (Corn, Soybeans, Wheat, Biomass, Sorghum)**

These apply to agronomic crop plots at the TPAC and Meigs locations

Plot locations will be assigned by farm according to available space, and plot needs with preference given to those who attend TPAC/Meigs day on campus

Land request form is required before space allocations can be made

Multi-year studies require a land request form annually

**FARM RESPONSIBILITY**

- Equipment Operation
    - Tillage, non-treatment spraying, cultivation, non-treatment fertilizer application, final plot clean up
- Non-treatment chemicals and fertilizers
- General crop scouting
- Plot border management (mowing, spraying, tillage)
- Equipment service and maintenance will be performed by farm staff (time, parts, and materials will be billed to PI for PI owned equipment)
- Final plot clean up management

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Plot maps
- Necessary marking of sub plots
- Treatment supplies and application labor/management
- Specialized Equipment (sensors, traps, plot harvesters, etc.)
- Investigator-purchased equipment service and maintenance expense (labor, parts, supplies)
- Sample and data collection/analysis
- Initial plot clean up (pulling stakes, flags, etc.)
- Provide farm staff with all regulation guidelines associated with crops grown

**Appendix 8: Feldun Equipment List**

**TRACTORS/POWER EQUIPMENT**

- Case IH MXU 125, 105 PTO, currently set to clear 5 ft windrow
- Ford 3600, 40 PTO
- Ford 3230, 32 PTO
- John Deere 4440, 130 PTO, 30”rows
- John Deere 7420, 115 PTO, 30” rows
- John Deere 6140, 110 PTO, loader
- John Deere 6400, 85 PTO, 30” rows

**HARVESTING/MOWING EQUIPMENT**

- Anderson 660 Bale wrapper
- Anderson TRB 1000 bale hauling wagon
- Ficklin gravity wagon – 400 bu
- Frontier 1010 wheel rake
- John Deere 4420, 4-30” corn head, 15’ grain platform
- John Deere 946 Mower Conditioner – 13ft
- John Deere 567 Roundbaler
- John Deere 3955 chopper, 2-row corn head and forage head
- Killbros gravity wagon – 150 bu
- Kools Silo blowers -- 2
- Krone 9 foot disc mower
- New Holland 258 Rolobar rake
- New Holland 169 tedder
- New Holland 275 small square baler
- Silage harvesting wagons – 4
- Woods Batwing, 15’

**SPRAYING/APPLICATION/CULTIVATION EQUIPMENT**

- Century Sprayer – 500 gal sprayer
- N- 28% side-dress applicator, 6 x 30
- New Holland 520 manure spreader
- New Idea 3626 manure spreader
- Willmar Super 500 dry fertilizer spreader

**PLANTING EQUIPMENT**

- John Deere 750 Drill, 15’, 7.5” row spacing, small seed grass box
- John Deere 7200 Planter, 6x30”, 2”x2” liquid starter

**TILLAGE EQUIPMENT**

- Krause 12 ft tandem disc
- IH 15 ft tandem disc
- IH Field cultivator – 24 ft
- Chisel plow -10 ft
- Kewanee -14 ft cultipacker
- Chain Harrow – 12 ft

**CATTLE FEEDING EQUIPMENT**

- HayBuster 2650 balebuster
- IH 1150 Grinder/Mixer
- Roundbale carrier wagons 6 bale cap – 2
- Roundbale feeding wagons - 4
- Roto-Mix 354-12 Feed Wagon

**CATTLE HANDLING EQUIPMENT**

- Foremost portable cattle chute
- Tru-Test portable cattle scale
- EID Technology
- Semi cattle-trailer loading chutes – 2
- Wilson 24 ft stock trailer
- Wilson 20 ft stock trailer

**SHOP/MISC. EQUIPMENT**

- Case 580 SuperK Backhoe
- Flatbed gooseneck trailer – 24 ft
- New Holland 565LX Skid Steer
- Polaris Rangers – 2
- Terex 500D Dozer/loader
- Landscape trailer 6x12ft
- IH PayStar 5000 dumptruck

**Appendix 9: Feldun Capacities, Recommendations and Responsibility**

**Calving Season** – By the calendar, Feb 10-April 15. However, it normally starts with a few heifers calving early the last few days of Jan or first few days of February and continuing through the end of April with a few straggler cows. Calving pastures are checked at least twice per day. Each morning newborn calves are tagged with a visual 'dangle' tag, an electronic ID tag, tattooed and bull calves are knife castrated. Data pertaining to calf and cow is recorded in and electronic handheld device. The second trip through the cow calving pastures in the afternoon is to check for cows having problems giving birth. Heifers are checked every 3 to 4 hours during the day and until about midnight each night to monitor for problems. If there are no signs of a heifer starting to calve at midnight, we'll resume checking them at daybreak. During periods of poor weather conditions, calving pastures are monitored throughout the night to check for cows having problems and to look for newborn calves to prevent chilling.

Branding/Spring working -- Cows with calves are weighed, given a lepto vaccination, poured with a dewormer and given 2 fly tags. Calves are weighed, given a blackleg and pinkeye vaccination, poured with a dewormer, given a fly tag and steers are implanted with a growth hormone. Cow/calf pairs are then sorted into their appropriate summer grazing group. Usually based on age and sire breed.

**Grazing Season** – Cows are split into 6 grazing groups based on cow sire breed or their production potential. The Oldham rental farm generally has about 50 SimAngus based pairs. Simmental sired cows will be kept at FPAC in two groups of approximately 35-40 pairs. Angus sired cows will be kept in two groups of 25 or 45 head depending on the grazing paddock they are placed in. Cows that had calves in the last 20 to 30 days in the calving season are typically sent to the Mullis farm as are cows that not high producers. Replacement heifers make up the 7$^{th}$ grazing group. They are kept in one group regardless of breed type. In addition to pasture, heifers receive approximately 10-12 pounds of silage daily, solely for the purpose of insuring the IBEP bull test bulls are receiving fresh silage daily. Cows and heifers are checked once daily, except the Mullis farm which is generally checked every other day. Fences, water source, animal health is inspected at this time.

**Breeding Season** – May 10-July 10. Replacement heifers have been developed at SIPAC. At SIPAC they will be synchronized with lutalyse, cystorelin and CIDRS. They will then be time AI'd within 72 hours of CIDRs being removed. Heifers are then transported back to FPAC within 48 hours of being time AI'd. Cows follow the same protocol at FPAC, unless they had a calf less than 30 days prior to breeding season. . Heifers and cows that show signs of standing heat are AI'd prior to 72 hours. Cows that stay at the Oldham rental farm are natural bred only. Cows that have had a calf less than 30 days prior to breeding season are likely to be sent to the Mullis rental farm and bred natural service as wellBulls are turned into the breeding pasture within a week of heifers and cows being bred.

Weaning/Pregnancy Check – In late August, Dr. Mark Hilton bring 2 or 3 students from campus to pregnancy check our cows and heifers. At this time we administer 2 respiratory vaccinations and booster the blackleg shot given in the spring. Cows receive a respiratory vaccination. Three to four weeks after pregnancy checking, we booster the respiratory vaccinations, deworm all calves and deworm all cows that are bred and will not be culled for other issues such as disposition, poor structure etc.

**Wintering the Cow Herd** – As pasture growth ceases for the winter and just prior to calving season all groups are brought into their winter calving pastures, fed hay that meets their nutrient requirements as needed. Animal health is checked daily at which time fences, water supply and mineral supply are also checked.

Herd bulls are kept in 3-5 separate lots during the year. Herd bulls housed in the herd bull barn receive approximately 20 pounds of silage daily to supplement their grazing.

**Appendix 10: Davis Equipment List**

**TRACTORS/POWER EQUIPMENT**

- Tractor - CaseIH Maxxum 140 Pro, 115 pto hp, Autopilot, FmX, Field IQ
- Tractor - NH 8670, 145 pto hp, Autopilot, FmX, Field IQ
- Tractor - JOHN DEERE 2755, 75 pto hp
- Tractor - White 37 Field Boss, 30 pto hp,
- Tractor - IH 140, 5 ft wide belly mower
- Tractor - Ford 860
- Truck – IH, dump bed, 200 bushel grain capacity
- Pickup - Ford F350, 2 wheel drive
- Pickup – Chevrolet 2500, 4-wheel drive
- Pickup – Chevrolet S10, 2-wheel drive
- ATV – Kawasaki Mule 3010, diesel, 4-wheel drive

**HARVESTING/MOWING EQUIPMENT**

- Harvest Corn, Soybeans and Wheat - Case IH 2344 Combine, Autopilot, Ag Leader PF 3000 Pro Yield Monitoring, 6-30 inch row (15 ft wide) corn head, 20 ft wide grain head
- Mower/Chopper – Bushhog Batwing Mower, 15 ft
- Gravity Bed Wagons – 3-J&M, side dump, 350 bu each
- Weigh Wagon – Grain O Vator, 10,000 lb capacity, 540 PTO, hydraulic auger control
- Westfield Grain Auger – 8 in diameter, 31 ft long, powered by Honda gas engine

**SPRAYING/APPLICATION/CULTIVATION EQUIPMENT**

- Liquid Fertilizer Application - Agrisystem Liquid Applicator, 7 knife, 30 in spacing, 6 Row 15 ft width, Rawson drive & John Blue pump, VRT
- Liquid Herbicide and Fertilizer Application - Spra-Coupe 4440, Autopilot, FmX, Field IQ, Raven control valve, 75 ft boom, 5-15 ft boom sections, 400 gal tank, nozzles 20 in spacing, VRT
- Lime and Gypsum Application - Chandler spreader, Rawson drive, 8 ton, 30 ft application width, VRT
- Dry Fertilizer Application – Valmar airflow spreader, Rawson drive, 45 ft application width, VRT
- Liquid Herbicide Application – Plot Sprayer, 15 ft boom, nozzles 20 inch spacing, 540 PTO roller pump, 50 gal tank, 3 gal cone bottom tank

**PLANTING/BED PREPARATION EQUIPMENT**

- Plant Corn - JOHN DEERE 1750 planter, Rawson drive on seeding and starter fertilizer, 6-30 in rows, notill, liquid starter fertilizer, insecticide boxes, VRT
- Plant Soybeans/Wheat/Cover Crops - JOHN DEERE 750 drill, Rawson drive, SI Belt Meters, 24-7.5 in rows, notill, Grass Seed Attachment, VRT

**TILLAGE EQUIPMENT**

- Brillion Disc Chisel, pull type, 11 shank, straight points, rolling basket attachment, 11.25 ft width, pull type
- Glencoe Field Cultivator, rigid shank, 22.5 ft width, 15 ft center section, Unverferth rolling basket attachment, pull type

- Sunflower Disk, 18 ft width, spring tooth harrow attachment
- Yetter Strip Till Bar, 6-30 in shanks, 15 ft wide, 3 pt hitch
- Tiller – Land Pride, 6 ft width, reverse tine, 3 pt hitch, 540 PTO

**PLOT LAYOUT/SAMPLING RESOURCES**

- Soil Sampling – Kawasaki Mule 3010, Wintex 1000 soil sampler, Nomad handheld computer, Farmworks mobile software, RTK GPS signal
- Map and Flag Plots – Kawasaki Mule, Nomad handheld computer, Farmworks mobile software, RTK GPS signal
- Plot Layout and Prescription File Generation – Farmworks Desktop Software and Ag Leader SMS Advanced Software

**SHOP/MISC. EQUIPMENT**

- 6000 lb capacity fork lift
- Backhoe/Loader, 5 ft wide loader, 24 in backhoe bucket,
- Skidloader, 4 ft wide bucket
- Mower – Grasshopper, diesel, 6 ft deck
- Mower – JOHN DEERE rotary mower, 3 pt. hitch, 8 ft. width
- Trailer – Gooseneck, winch, ramps, 14 ft. long
- Trailer – Small, single axle, bumper hitch
- Nurse Tank – 1,000 gallon, gas engine transfer pump
- Liquid Fertilizer Storage – 3-1,500 gallon tanks

**Appendix 11: Davis Capacities, Recommendations and Responsibility**

## DPAC Equipment Service and Repair

**PAC RESPONSIBILITY**

- Perform necessary preventive maintenance, service, and repair of equipment (PAC and PI owned). Investigator will be billed for labor, parts, and materials. Labor will be billed on actual time used.
- Provide parts, repairs, supplies and hardware used on PAC owned equipment
- Maintain adequate supply of general shop supplies (common fasteners, lubricants, cleaners, rags, safety supplies, necessary tools) needed for day to day operations.

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by PAC staff
- Provide necessary manuals, diagrams, and layouts requested by PAC staff
- Report any issues or breakdowns with equipment ASAP to PAC staff
- Inform PAC staff if equipment needs service or work

## DPAC Agronomic Crop Responsibilities (Corn, Soybeans, Wheat)

Plot locations will be assigned by Davis-PAC staff according to available space, and plot needs with preference given to those who attend DPAC day on campus
Land request form is required before space allocations can be made
Multi-year studies require a land request form annually

**PAC RESPONSIBILITY**

- Equipment Operation
- Non-treatment chemicals and fertilizers along with Treatments if PAC equipment is utilized
- General crop scouting
- Plot border management (e.g. mowing, spraying, tillage)
- Equipment service and maintenance will be performed by PAC staff (time, parts, and materials will be billed to PI for PI owned equipment)
- Final plot clean up management

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by PAC staff
- Plot maps
- Necessary marking of sub plots
- Treatment supplies and application labor/management
- Specialized Equipment (sensors, traps, plot harvesters, etc.)
- Investigator-purchased equipment service and maintenance expense (labor, parts, supplies)
- Sample and data collection/analysis
- Initial plot clean up (pulling stakes, flags, etc.)
- Provide farm staff with all regulation guidelines associated with crops grown

**Appendix 12: Northeast Equipment List**

**TRACTORS/POWER EQUIPMENT**

- Case IH Puma 170, 30" rows, 140 hp, RTK Autosteer
- New Holland TM135, 110 hp, 30"rows, RTK Autosteer
- John Deere 2955, 85 hp, 30" rows, loader
- John Deere 2155, 40 hp, 30" rows

**HARVESTING/MOWING EQUIPMENT**

- John Deere 9400, 170 hp, 6-30" corn head, 18' grain platform, Yield Monitor
- John Deere 3300, 70 hp, 3-30" corn head, 13' grain platform, weigh system
- Bush Hog 3126 mower, 10'
- Woods finish mower, 7'

**SPRAYING/APPLICATION/CULTIVATION EQUIPMENT**

- Spra-Coupe 4640, 60' boom, 15" nozzle spacing, 400 gal, light bar, AgLeader monitor
- 3pt 15' sprayer, 35 gal
- Ag Systems 6000 28% liquid side dresser, 6 x 30"
- Barber 7', 3 pt. dry fertilizer spreader
- Yamaha Terrapro ATV sprayer, 10-15', 20" nozzle spacing, 25 gal
- John Deere 400 rotary hoe, 15'

**PLANTING EQUIPMENT**

- JOHN DEERE 750 Drill, 15', 7.5" row spacing, small seed grass box, VRT
- John Deere 7200 MaxEmerge Planter, 6x30", strip tillage, 2"x2" liquid starter, VRT
- John Deere Model 7000 planter, 4 row, liquid starter

**TILLAGE EQUIPMENT**

- Glencoe Soil Saver disk chisel plow, 7 shank
- Howard Rototiller, 40"
- Kent Field Cultivator, 15'
- Brillion Cultimulcher, 15'

**IRRIGATION EQUIPMENT**

- Hienzmann Traveler ¾" Irrigation Gun, 3" pipe, limited to use in the DTC due to proximity to pond

**SHOP/MISC. EQUIPMENT**

- JCB 1400B Backhoe Loader
- John Deere Gator UTV
- Brent Weigh Wagon, 5000 lb. capacity

## Appendix 13: Northeast Capacities, Recommendations and Responsibility

**Northeast Capacities**

- 360 acres of crop land, 200 acres suitable for research.
- 19 fields at NEPAC have between 3 and 10 acres suitable for plot work (average 6 acres)
- 8 fields at NEPAC have between 10 and 18 acres suitable for plot work (average 13 acres)
- 2 fields at NEPAC have over 20 acres suitable for plot work (average 21 acres)
- Basic treatment application capability (seeding rates, N rates, pesticide application)
- Basic scouting ability (stand counts, maturity notes, common weed/insect/disease identification and infestation levels)

**Northeast Agronomic Crop Responsibilities (Corn, Soybeans, Wheat, Biomass, Sorghum)**

- Plot locations will be assigned by farm according to available space and plot needs
- Land request form is required before space allocations can be made
- Multi-year studies require a land request form annually

**FARM RESPONSIBILITY**

- Equipment Operation
- Tillage, spraying, cultivation, fertilizer application, final plot clean up
- Non-treatment chemicals and fertilizers
- General crop scouting
- Plot border management (mowing, spraying, tillage)
- Equipment service and maintenance can be performed by farm staff (parts and materials will be billed to PI for PI owned equipment)
- Final plot clean up management

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Plot maps
- Necessary marking of sub plots
- Treatment supplies and application labor/management
- Specialized Equipment (sensors, traps, plot harvesters, etc.)
- Investigator-purchased equipment service and maintenance expense (parts, supplies)
- Sample and data collection/analysis
- Initial plot clean up (pulling stakes, flags, etc.)
- Provide farm staff with all regulation guidelines associated with crops grown

**Appendix 14: Pinney Equipment List**

**TRACTORS/POWER EQUIPMENT**

| | | |
|---|---|---|
| • TRACTOR 35 HP, | Ford | 3950 |
| • TRACTOR 60 HP, Auto/RTK | JOHN DEERE | 6200 w/cab |
| • TRACTOR one row cultivator | IH | SUPER A |
| • TRACTOR 120 HP, Auto/RTK | New Holland | 8360 |
| • TRACTOR narrow frt tires | Allis Chalmers | CA |
| • TRACTOR belly cultivator | Allis Chalmers | G |
| • TRACTOR loaned to TPAC | Farmall | 200 |
| • TRACTOR 150 HP MFWD | CASE/IH | 7220 |
| • TRACTOR 130 HP | CASE/IH | 7120 |
| • TRACTOR 55HP | JOHN DEERE | 2155 |
| • TRACTOR 85 HP, narrow tire | JOHN DEERE | 2955 w/cab |
| • TRACTOR 42" belly mower | IH | CUB-RED |
| • TRACTOR 25 gal sprayer | IH | CUB-YELLOW |
| • TRACTOR | IH | CUB-RED |
| • TRACTOR with frt. loader | JOHN DEERE | 2955 |
| • TRACTOR used on veg. | Allis Chalmers | 5010 |

**HARVESTING/MOWING EQUIPMENT**

- CaseIH 2366 combine, yield monitor, 6 row corn head and 18' grain platform
- Head mover
- Bushhog 2615L batwing 15' mower
- Bushhog 286 3 point 6' mower
- IH cub with 42" belly mower
- Grasshopper 928D 72" front deck mower
- Kilbros 500 bushel Grain Cart with scale
- 6 Gravity wagons
- IH Grain Truck

**SPRAYING/APPLICATION/CULTIVATION EQUIPMENT**

- Miller 4215 Nitro, 60/90' boom, 15" nozzle spacing, 1000 gal, GPS-RTK, Autosteer
- Century 300 gallon, 3 point, 45' boom
- Myers Mity Mist Air Blast sprayer
- 25 gallon, 15', 3 point sprayer
- Dalton 750 gallon liquid fertilizer applicator
- 500 gallon liquid fertilizer applicator
- Gandy 10' dry fertilizer applicator
- Multi tank vegetable, 25 gallons each, sprayer with a side boom
- John Deere 6 row 3 point cultivator
- Noble 4 row 3 point cultivator
- John Deere 15' rotary hoe

**PLANTING/BED PREPARATION EQUIPMENT**

- John Deere 1560 15', 7.5" Grain Drill
- John Deere 1750 6 row planter finger pickup
- John Deere 7000 3 point planter, finger pickup
- Rain flow Trans planter

- 4’ Raised bed vegetable bedder
- 8’ Brillion seeder

**TILLAGE EQUIPMENT**

- 6’ Land Pride 3 point reverse tine tiller
- 2’ Troy Built walk behind tiller
- 25’ John Deere Field Cultivator
- 18’ CaseIH Combo Mulch Finisher
- 27’ Unverferth Rolling Harrow
- 23’ CaseIH Disk with buster bar harrow
- 10’ 3 point Bervac finisher
- 42” 3 point Bervac finisher
- 6’ 3 point Massey Ferguson disk
- Glencoe 9 shank chisel plow with leveling bar

**IRRIGATION EQUIPMENT**

- 600’ Valley Linear Irrigation rig - Loam
- 315’ Valley Linear Irrigation rig – Sand
- Kifco Hose Reel & Watering boom
- John Deere Irrigation Engine – Sand
- John Deere Irrigation Engine - Loam

**HEAVY EQUIPMENT**

- Case TD6 Bulldozer
- Case 1085 Excavator
- Wiggins Fork Lift
- Baker Fork Lift
- 2 Tug Tractors

**UTILITY VEHICLES**

- Micro Truck 1
- Micro Truck 2
- Kubota RTV UTV 1150
- Kubota RTV 900

**TRUCKS & TRAILERS**

- Ford 8000 Semi Tractor
- 08 Ford F250 ¾ ton, 4 wheel drive, crew cab truck
- 97 Ford F250 ¾ ton, 2 wheel drive long bed truck
- 97 Ford Ranger ½ ton, 2 wheel drive short bed truck
- 92 Dodge 1 ton, 4 wheel drive truck
- 16’ Double Axle, single wheel, 4’ dovetail
- 50’ Vulcan flatbed trailer

**SHOP/MISC EQUIPMENT**

- Century wire welder
- Lincoln stick welder
- Plasma cutter
- Drill Press

- Stationary grinder
- 20 Ton press
- Power Hack Saw
- Coates tire changer
- Miscellaneous Hand and Power Tools

**GPS/RTK TOOLS**

- Trimble Base Station - Rice Farm
- Trimble Base Station – Pinney Farm
- Trimble Nomad Hand Held

**INFASTRUCTURE**

- Super B Grain dryer with 30,000 bushels of corn capacity & 10,000 bushel of soybean capacity
- 30’ x 48’ Greenhouse
- Two 30’ x 48’ Rolling High Tunnels
- 4’ x 8’ x 12’ Plant Dryer
- Two Walk in Coolers
- Equipment storage sheds
- Two residences: Superintendent and Shop Foreman
- Large Meeting Room – capacity for 40
- Farm Shop

## Appendix 15: Pinney Capacities, Recommendations and Responsibility

### CAPACITIES

- 664 acres of crop land, 560 acres suitable for research
- 3 distinct soil types; Sebewa Loam, Tracy Sandy Loam, and Edwards Shallow Muck
- Corn soybean rotation with predominately conventional tillage with the exception of the Edwards Shallow Muck which is continuous no-till
- Irrigated acres by soil type: Nine 4 acre fields of Sebewa Loam, four 9 acre fields of Tracy Sandy Loam
- Un-irrigated by soil type breakdown: Two 50 acre fields of Muck, one 25 acre Tracy Sandy Loam, and 290 acres of Sebewa Loam ranging in size from 5 acres to 50 acres
- Fields dedicated to vegetables: three 3 acre fields on Tracy Sandy Loam
- Field spaces on Black Sandy soils at the Rice farm are available by request only from the Director's Office
- 40 acres of Timberland with 10 acres in the CRP
- Basic treatment application capability (seeding rates, N rates, pesticide application)
- Basic scouting ability (stand counts, maturity notes, common weed/insect/disease identification and infestation levels)

### RESPONSIBILITIES
### GRAIN CROPS

**AGRICULTURAL CENTER STAFF RESPONSIBILITIES**

- Assign research plot location in designated field upon completion of field request form
- Provide soil test results
- Operate various types of farm machinery as needed
- Maintain farm machinery in terms of service and calibration
- Provide fuel, seed, fertilizer, insecticide, and pesticides that are non-treatment or experiment related
- Manage irrigation rig systems and applications upon request
- Assist with plot scouting
- Plot clean up and appearance includes mowing field edges, tilling alleyways, and gleaning off harvestable grain after experiments are finished

**RESEARCH STAFF RESPONSIBILITIES**

- Attend Day on Campus to initiate field request process
- Provide account numbers as needed for inputs or repair parts
- Provide updated plot maps throughout the growing season
- Furnish needed inputs specific to the research plot needs; including seed, fertilizers, and pesticides
- Plot layout must conform to equipment provided by the PAC, otherwise needed equipment needs to be provided by the research project
- Hire, supervise, and manage any and all part time labor required by the experiment.
- Assist with scouting, sample and data collection/analysis
- Initial plot clean up (pulling stakes, flags, etc.)
- Provide farm staff with all regulation guidelines associated with crops grown
- Supply all crews with needed supplies

## TIMBER & HORTICULTURAL CROPS

**AGRICULTURAL CENTER STAFF RESPONSIBILITIES**

- Assign research plot location in designated field upon completion of field request form
- Provide soil test results
- Operate various types of farm machinery as needed
- Maintain farm machinery in terms of service and calibration
- Plot clean up and appearance includes mowing field edges, tilling alleyways, and gleaning off harvestable grain after experiments are finished
- Irrigation applications will be a joint effort between PAC and research staff

**RESEARCH STAFF RESPONSIBILITIES**

- Attend Day on Campus to initiate field request process
- Provide account numbers as needed for inputs or repair parts, electrical usage on coolers, and liquid propane used for drying ovens, related to research experiments
- Provide updated plot maps throughout the growing season
- Furnish needed inputs specific to the research plot needs; including seed, fertilizers, irrigation supplies, plastic mulch, and pesticides
- Irrigation applications will be a joint effort between PAC and research staff
- Plot layout must conform to equipment provided by the PAC, otherwise needed equipment needs to be provided by the research project
- Hire, supervise, and manage any and all part time labor required by the experiment
- Sample and data collection/analysis
- Initial plot clean up (pulling stakes, flags, etc.)
- Provide farm staff with all regulation guidelines associated with crops grown
- Supply all crews with needed daily supplies
- Perform any and all requirements associated with High Tunnel and Greenhouse work

**Appendix 16: Southeast Equipment List**

**TRACTORS/POWER EQUIPMENT**

| | | | | |
|---|---|---|---|---|
| • JOHN DEERE | 4430 | 1976 | 125hp | |
| • JOHN DEERE | 4240 | 1981 | 110hp | |
| • JOHN DEERE | 4040 | 1982 | 90hp | RTK auotsteer |
| • FORD | 5000 | ~1976 | 53hp | Gas |
| • FORD | 3430 | 1994 | 38hp | |
| • JOHN DEERE | 6420 | 2004 | 90hp | MFWD; Loader |
| • New Holland | T7040 | 2007 | 150hp | MFWD |
| • New Holland | T6070 | 2010 | 120hp | RTK auotsteer; MFWD |
| • JOHN DEERE | 4400 | 2001 | 30hp | MFWD; Forestry Dept. owned |

**PLANTING/EQUIPMENT**

| | | | | | |
|---|---|---|---|---|---|
| • JOHN DEERE | 1750 | 2003 | Corn Planter -15' 6 row | 30" No-Till; Variable Rate Seeding |
| • JOHN DEERE | 1560 | 2002 | Grain Drill w/ grass box-15' 24row | 7.5" No-Till; Variable Rate Seeding |
| • JOHN DEERE | 7000 | | Corn Planter - 10' 4 row | 30" No-Till |

**SPRAYING EQUIPMENT**

| | | | | | |
|---|---|---|---|---|---|
| • APACHE | 560 | 1998 | SELF-PROPELLED - APPROX.60' BOOM | LIGHTBAR GUIDANCE; 500 GAL; 15"NOZZLE SPACINGS |
| • AGROCHEM | | | 3PT. 35GAL. 15' BOOMS | 30" NOZZLE SPACINGS |

**APPLICATION EQUIPMENT**

| | | | | |
|---|---|---|---|---|
| • CHANDLER | 10-PTT-FT | 1996 | DRY FERTILIZER (45')-LIME (30') | VARIABLE RATE APPLICATION |
| • AGRISYSTEMS | | 2010 | UAN APPLICATOR 15' | VARIABLE RATE APPLICATION |

**HARVESTING EQUIPMENT**

| | | | | |
|---|---|---|---|---|
| • JOHN DEERE | 9400 | 1992 | 185 HP straw walker | 2wd; RTK Autosteer; Yield Monitor |
| • JOHN DEERE | 9550 | 2001 | 220 HP straw walker | 2wd; Yield Monitor |
| • JOHN DEERE | 3300 | 1975 | 57 HP With 3 row corn head | Harvest Master data collection system |
| • JOHN DEERE | 643 | 1992 | 6 row corn head | Rebuilt 2012 w/ Chalmers |
| • JOHN DEERE | 615 | 1992 | 15' Platform | |
| • Hege | 125B | 1979 | Small Grains Plot Combine | 4' swath |
| • J&M | 620 | 2007 | 600 Bushel Grain Cart | with scales |
| • International | LoadStar | 1976 | Tandem Axle Grain Truck | 500 bu. |
| • Killbros | 375 | 1981 | Gravity Wagon | 375 bu. |
| • McCurdy | GB275 | 1985 | Gravity Wagon | 275 bu. |
| • Killbros | 1072 | 1979 | Gravity Wagon | 275 bu. |

**TILLAGE EQUIPMENT**

| | | |
|---|---|---|
| • JOHN DEERE 220 Disk 22 ft. | Glenco Soil Finisher 15 ft. | Land Pride Tiller RTR2570 |
| • Massey Ferguson 620 Disk 15ft. | IH 720 5 bottom Plow | Eversman Landleveler |
| • Glenco Disk Chisel 7 shank 10ft. | Hieniker 4 row cultivator | |
| • Noble RoRunner 6 row cultivator | JOHN DEERE 415 Rotary Hoe | |

**TRUCKS, TRAILERS, ETC. EQUIPMENT**

| | | | |
|---|---|---|---|
| • Chevrolet | 2500HD | 2003 | 2wd; ext.cab; short bed |
| • Chevrolet | 2500 | 1992 | 2wd |

| | | | |
|---|---|---|---|
| • Ford | F350 | 2011 | 4wd ;dump bed; GN; diesel |
| • General Motors | Blazer | 1984 | 4wd; diesel; surplus equip. |
| • Corn Pro | 16+5 6K | 2008 | 16ft. utility bumper hitch trailer |

**MOWING EQUIPMENT**

- 1996 Woods Batwing Rotary Mower 15ft.
- 2001 Dixie Chopper Lawn Mower 5ft.
- 1989 Bushhog 5ft.
- 2011 Woods 4ft. Rotary Mower (Forestry Dept.)

**EARTH MOVING EQUIPMENT**

| | | | |
|---|---|---|---|
| • CAT | 246 | 75HP skid loader | 2000#Loader rating; tracks |
| • CASE | 1150E | 120HP Bulldozer | 10ft. Blade; Federal Surplus |
| • CAT | D4C | 78HP Bulldozer | ~8ft. Blade; Fed.Surplus; Forestry Dept. |
| • Dresser | 540 | 205HP Payloader | 12000# Loader rating; Fed.Surplus |
| • JOHN DEERE | 690D | 75HP Excavator | Fed. Surplus |
| • JOHN DEERE | 670A | 125HP Road Grader | 12 ft. Blade; Fed. Surplus |
| • International | | Tandem Dump Truck | Diesel; Federal Surplus |
| • Trail-eze-Dakota Surplus | D30T | Dozer Trailer w/dolly | Pulled with NHT7040 on farm use only; Fed. |

**MISC. EQUIPMENT**

| | | |
|---|---|---|
| • 1993 Kawasaki Mule 1000 4x2 | 2009 Farmi Skidding Winch | Wintex1000 Automatic soil sampler |
| • 2007 Kawasaki Mule 3010 Trans. 4x4 | 2009 Timberline Tree Shear | Trimble Nomad Handheld |
| • Apache People Transport Trailers | Grace 2100 Tree Puller | RTK Base Station |
| • Crop Sample Dryer | Walk-In Cooler | Weigh Tronix 615 Truck Scale 60,000# capacity |

**Appendix 17: Southeast Capacities, Recommendations and Responsibility**

## SEPAC Agronomic Crops

### CROP RESEARCH CAPABILITIES

- 800 acres of crop land in 59 fields averaging 13.5 acres in size
  - 22 fields with less than 5 acres
  - 17 fields with 6 to 15 acres
  - 8 fields with 16 to 25 acres
  - 12 fields with 26 to 51 acres
- Capability to conduct crop research in small replicated plots or large replicated strip trials
- Real Time Kinetics system of plot equipment used to provide sub-inch plot accuracy
- Primary agronomic crops grown at SEPAC are corn and soybeans
- Secondary agronomic crops grown at SEPAC are wheat, sorghum, and sunflowers
- Most agronomic crops are planted with no-till farming practices as the majority of the farm has 20 to 25 years of continuous no-till history

### FARM STAFF RESPONSIBILITIES

- Provide plot location assignments according to available space, and plot needs with preference given to those who attend SEPAC day on campus meetings
- Setup, maintain and calibrate planters, sprayers, fertilizer applicators and combines
- Operate all tractors, sprayers, planting equipment, fertilizer application equipment, and harvesting equipment
- Provide fuel for all PAC owned equipment only
- Provide non-treatment seed, chemicals and fertilizers
- Provide general crop scouting
- Provide plot border management (mowing, spraying)
- Provide final plot clean up management
- Conduct soil sampling on a 4 year rotation and on 1/2 acre grid layout
- Maintain field operations logs in Farmworks software

### RESEARCHER RESPONSIBILITIES

- Request field research space annually using PAC research request forms
- Provide account numbers to farm staff prior to any work being done or supplies ordered by farm staff
- Prepare and provide plot maps
- Handle necessary marking of sub plots
- Provide treatment supplies and application labor/management
- Provide and setup specialized equipment (sensors, traps, plot harvesters, etc.)
- Fund investigator-purchased equipment service and maintenance expense (labor, parts, supplies)
- Provide sample and data collection and analysis
- Provide initial plot clean up (pulling stakes, flags, etc.)
- Provide farm staff with all regulation guidelines associated with crops grown

## SEPAC Forestry Crops

**FORESTRY RESEARCH CAPABILITIES**

- 1519 acres of established hardwood forests
- 97 acres of hardwood plantations less than 20 years old
- 25 acres fenced deer exclusion areas for forestry research
- Research Request Forms are used annually to request research field space.
- Plot locations will be assigned by farm according to available space, and plot needs with preference given to those who attend SEPAC day on campus meetings.
- Multi-year studies require a land request form annually

**FARM STAFF RESPONSIBILITIES**

- Provide plot location assignments according to available space, and plot needs with preference given to those who attend SEPAC day on campus meetings
- Provide access roads to forested areas
- Provide general woodland pest scouting
- Provide plot border management (mowing, spraying)

**RESEARCHER RESPONSIBILITIES**

- Request field research space annually using PAC research request forms
- Provide account numbers to farm staff prior to any work being done or supplies ordered by farm staff
- Provide plot maps
- Handle necessary marking of sub plots
- Provide treatment supplies and application labor/management
- Provide and install specialized equipment (sensors, traps, planters sprayers, etc.)
- Provide investigator-purchased equipment service and maintenance expense (labor, parts, supplies)
- Provide sample and data collection and analysis
- Conduct initial plot clean up (pulling stakes, flags, etc.)
- Provide farm staff with all regulation guidelines associated with crops grown

## SEPAC Equipment Service and Repair

**SERVICE AND REPAIR CAPABILITIES**

- 40’ x48’ heated farm shop with basic power tools, hand tool, wrenches and welding equipment for routine machinery maintenance.

**FARM STAFF RESPONSIBILITIES**

- Service and maintain all PAC owned equipment in field ready condition
- Provide parts, repairs, supplies and hardware used on farm owned equipment
- Maintain adequate supply of general shop supplies (common fasteners, lubricants, cleaners, rags, safety supplies, necessary tools) needed for day to day operations

**RESEARCHER RESPONSIBILITIES**

- Report any issues or breakdowns with equipment ASAP to farm staff
- Inform farm staff if their equipment needs service or work
- Provide necessary manuals, diagrams, and layouts requested by farm staff
- Provide account numbers to farm staff prior to any work being done or supplies being ordered by farm staff

**Appendix 18: Southern Equipment List**

**TRACTORS:**

- Ford 4610 – 45 hp
- Ford 7740 MFWA w/loader – 75 hp
- John Deere 4455 – 145 hp (hooked to feed wagon 90% of the time)
- John Deere 4455 – 145 hp
- John Deere 7510 MFWA – 125 hp

**TILLAGE/PLANTING/SPRAYING:**

- 12’ Ford Disc
- 3 bottom Massy Ferguson plow
- 6’ Howard Rotavator pto powered tiller
- 16’ chain harrow
- 10’ John Deere 750 no till drill with 2 boxes
- 16’ Gandy 3 point air seeder
- ATV mounded broadcast seeder
- Pull type field sprayer – 45’ booms
- ATV mounted spot sprayer
- 12’ roto wiper chemical applicator

**FORAGE HARVESTING:**

- 9’ John Deere 926 disc mower conditioner
- 7’ New Idea disc mower
- 6 basket 27’ New Holland tedder
- 28’ New Holland wheel rake
- 7’ New Holland bar rake
- New Holland 315 small square baler
- John Deere 567 large round baler – can make dry or silage bales
- Anderson Bale wrapper
- Anderson auto loading bale wagon

**LIVESTOCK FEEDING EQUIPMENT:**

- Jay Lor 4575 single auger vertical mixer
- Arts Way 2 ton feed grinder mixer
- Feed Train ATV feed delivery cart – 500 lb capacity
- Small digital scales for weight small feed amounts or individual feeding

**OTHER EQUIPMENT:**

- Caterpillar 926G pay loader
- Caterpillar D7 straight blade dozer
- New Holland LS 180 skid loader – tracks, scale, bucket, pallet fork, hay spear, tree shear, brush cutter, post-hole auger, back hoe with 24” bucket
- New Holland 185 manure spreader
- 2 Honda Rubicon 4x4 ATV
- John Deere Gator 825i utility vehicle
- Grasshopper zero turn lawn mower
- Tractor mounted post driver
- Pneumatic small post driver

- 15’ bat wing bush hog
- 8’ mounted bush hog
- 20’ x 7’ livestock trailer
- 4’ x 8’ slide in truck bed animal hauler

**Appendix 19: Southern Capacities, Recommendations and Responsibility**

**LOCATION:**

SIPAC is located in the North East corner of Dubois County. It is approximately 180 miles south of main campus with a travel time of 3.5 to 4 hours

**STAFF RESOURCES:**

One full time Farm Superintendent and 2.5 FTE service staff

One full time Extension forester and 0.5 FTE service staff

**LAND BASE:**

Permanent Pastures - Endophyte Infected Tall Fescue/Clover
289 acres in 25 different pastures
Low Endophyte Fall Fescue/Clover
89 acres in 5 different pastures
Novel Endophyte Tall Fescue/Clover
51 acres in 3 different pastures

Of these acres in permanent pasture 16 acres in 3 lots are permanently fenced to hold goats

Fields in annual forages – 68 acres in 5 different fields

Dry lot areas – 16 acres in 5 lots

Forested Areas – 590 acres in 31 "compartments"

**PONDS:**

There are 20 ponds making a total of 18 surface acres of water. They range in size from about 0.5 acres to 3.0 acres

**LIVESTOCK BASE:**

Beef Cow Herd – SIPAC maintains a herd of approximately 210 fall (September and October) calving crossbred commercial cows. All replacement female are raised from the herd.

Meat Goat herd – SIPAC maintains a herd of approximately 75 spring (May and June) kidding crossbred commercial does. All replacement females are raised from the herd.

Back-grounding – SIPAC does all the back-grounding and heifer development work for the calves born at the Feldun Purdue Agricultural Center. This consists of 220-250 calves each year. Heifers are typically housed at SIPAC from October to May. The steers are housed at SIPAC from October to mid-November.

Aquaculture – warm water fish can be housed May through October

**FEED STORAGE:**

6 bulk bins with approximately 50 ton of storage

2 bulk commodity bays (flat storage) with approximately 75 ton of storage

200 ton of dry hay in large square bales can be stored inside. The rest of the hay is in outside storage

**FEEDING FACILITIES**

Beef: Outside lots – 7 lots

13 e - 75' of bunk space, 13 w – 75' of bunk space, lower beef – 100' bunk space, middle beef – 50' of bunk space, upper beef – 70' of bunk space, Mound 1 - 45' of bunk space, Mound 2 – 45' of bunk space

Inside pens – 10 pens

Beef pens – 8 pens with 23' of bunk space/pen (can be made to 16 pens in non-freezing weather)
Dairy Barn pens – 2 pens with 75' of bunk space/pen

Goats: Outside lot – at old dairy includes winter water, 10'x16' shelter, portable feed and hay bunks
Inside pens – at old dairy – 2 pens with winter water and portable feed and hay bunks
We have portable panels that we can make up to 36 individual feeding pens

Aquaculture: in 3.5 acre pond
Have whole pond and individual cage aeration
Can feed up to 6, 4'x4'x6' cages in dock area

**ANIMAL HANDLING FACILITIES:**

Beef – SIPAC has 3 beef handling areas on the farm. One the "beef barn", one at the "old dairy" and one out in the grazing area on the north-west side of the farm. All 3 facilities have sorting pens, crowd tubs, working alley, working chutes and scales.
Goats – SIPAC has 1 goat handling area located at the "old dairy." It has sorting pens, crowd tub, working alley, turn table for trimming feet, scale and a head catch for herd work.

All scales are digital Tru-Test models that are checked for accuracy each May.

**TYPICAL PRODUCTION CYCLES AT SIPAC:**

Beef:
Calving – heifers will start calving around August 25 with the cows following about September 5
Breeding on heifers occurs around Nov 25 starting with AI and herd bulls going in about a week later
Breeding on Cows occurs around December 5 starting with a TAI program and bulls going in about a week later
Herd bulls are left in about 50 days
Weaning occurs between February 1 and March 1 depending on weather and forage supply
Cows go to grass round the first week of April and will graze until January 15 on an average year
Herd work is done in late January (pre weaning shots), February (weaning), March (pregnancy checking annual vaccinations), April (cows to grass), June (fly tags), November (heifer breeding), December (cow breeding)
Grazing – cows are grazed in 3 to 5 groups on an annual basis rotationally grazed being moved every 1 to 3 days

Goats:
Kidding – does will begin kidding around May 5 out on pasture
Breeding - Bucks are turned in around December 1 – they are in the herd 60 days
Weaning occurs about August 10 when kids are 90 days old
Herd work – Pregnancy check occurs in March, parasite control begins on a monthly basis in April using the FEMACH system on the does and deworming kids every 30 days beginning in June
Grazing – does are grazed in 1 to 2 groups on an annual basis rotationally grazed being moved every 1 to 3 days

**EXTRA COST THAT SHOULD BE COVERED BY PI OR PROJECT:**

If cows or goats need to be managed in more smaller groups than SIPAC standard operating system
If project requires animals to be feed when there is forage to graze that feed cost should be covered
If project requires animal handling other than normal production practices listed above
If project requires individual or small group feeding labor should be covered

**Appendix 20: Southwest Equipment List**

**TRACTORS/POWER EQUIPMENT**

- Ford 7740 – SLE-110 HP, t-rail duals,
- John Deere 6410- 90 HP, front wheel assist, axle mount duals
- John Deere 6120, 70 HP
- Ford 6610,-65 HP, with front loader
- Ford 4600- 45 HP
- Ford 3000- 30 HP
- Case/IH 265-25 HP, High clearance offset with mounted cultivators
- Oliver 550- 30 HP
- IH Cub with mounted dome sprayer, 20 HP
- Allis Chalmers G with mounted cultivators, 16 HP
- New Holland T1510, 35 HP-High tunnel tractor

**HARVESTING/MOWING EQUIPMENT**

- John Deere 6620 combine
    - 6 row corn head
    - 16’ small grain platform
- Wintersteiger Small Grain Plot Combine, 5’ grain table
- International grain truck-250 bushel capacity
- International grain truck-300 bushel capacity
- Bush Hog pull type 10’ rotary mower
- Bush Hog 3-pt hitch 7’ rotary mower
- BEFCO sickle bar mower, 8’
- New Holland front mount 72” deck, rear discharge lawnmower
- Grasshopper front mount 61” deck, rear discharge lawnmower
- Simplicity, side discharge 38” deck lawnmower
- John Deere self-propelled push mower
- John Deere self-propelled push mower

**SPRAYING/APPLICATION/CULTIVATION EQUIPMENT**

- Gandy 15’ orbit air spreader
- Agro-Chem John Blue 500 gallon liquid applicator
- Hardi 500 gallon, 45' herbicide sprayer
- John Bean 100 gallon, orchard air blast sprayer
- Century 500 gallon 30’ single boom high pressure vegetable sprayer
- 5 tank plot sprayer with 30' boom, multi-row vegetable sprayer
- 3 - 5 Tank single row vegetable plot sprayers
- 8' Danish-tine vegetable cultivator
- 8' Danish-tine vegetable cultivator with sprayer
- John Deere 6 row cultivator

**PLANTING/BED PREPARATION EQUIPMENT**

- John Deere 7000, 6 row no-till corn planter with liquid fertilizer attachments
- John Deere 7000 11 row, 15" no-till soybean planter
- Hege 3-pt hitch plot wheat drill, 8 Hole

- Great Plains pull type no-till plot wheat drill, 10 Hole
- John Deere, wheat drill, 18 Hole
- RAINFLO 3-pt hitch water wheel transplanter
- Buckeye 3' plastic layer with bedder and t-tape
- 4’ plastic mulch layer with bedder and t-tape
- 4’ plastic mulch layer with t-tape

**TILLAGE EQUIPMENT**

- John Deere 15’ field cultivator with harrow
- Kewanee 9 shank chisel plow
- IH 18' disk with harrow
- Allis Chalmers 12’ disk with harrow,
- Allis Chalmers 5 bottom semi-mount, 16’ mo-board plow
- Land Pride 6’reverse rotary tiller
- Woods 5’rotary tiller
- John Deere 15' rotary hoe
- Brillon 15' packer
- Brillon 8' packer

**SPECIALTY EQUIPMENT**

- Club Car gas powered golf cart with Doran 8000 SL 100 lb. capacity electronic scales and Toughbook laptop
- Yamaha gas powered golf cart with Doran 8000 SL 100 lb. capacity electronic scales and Toughbook laptop
- Pallet scale with wagon, 4000 lb. capacity
- Rainflo plastic mulch lifter
- Mankar hand held dome sprayer
- Eversman land leveler
- Troy-Bilt walk behind garden tiller, 7 HP
- BCS 749 self-propelled tractor – 13 Hp w/attachments (tiller, snow blower, v-cultivator, rotary plow, & furrower)

**IRRIGATION EQUIPMENT**

- KIFCO B-130 350’ length capacity water reel
- KIFCO B-140 350’ length capacity water reel
- T-tape layer

**SHOP MISC. EQUIPMENT**

- John Deere 4X4 HPX Gator
- John Deere 6X4 Gator
- John Deere 4X2 Gator
- John Deere 4X2 Gator
- Kawasaki 360 ATV, 4x4 with 15 gallon mounted sprayer with 15’ boom
- 7 - 14' melon wagons, one with hoist
- Case Backhoe 77D560
- Land Pride 7' grader blade
- Bush Hog 72" box Blade

**Appendix 21: Southwest Horticulture Crops Capacities, Recommendations and Responsibility**

These apply to all horticulture crops grown at SWPAC and general farm operations

Total conventional plot area is limited to approx. 15 acres each growing season to allow for sufficient crop rotation

Plot locations will be assigned by SWPAC superintendent according to available space, and plot needs with preference given to those who attend SWPAC Day-on-Campus

A Request for Research Form is required before space allocations can be made

Multi-year studies will require a land request form submitted annually

If pesticides are to be applied as bulk applications by PAC the suggested number of treatments should be in increments of 7 for muskmelon trials or trials with 6ft spacing between rows and 5 for watermelon trials or trials with 8ft row spacing. This will allow for adequate coverage.

**FARM RESPONSIBILITY**

- Applications and Equipment Operation
    - Tillage, bed formation, planting, non-treatment spraying, cultivation, non-treatment fertilizer application, final plot clean up (mowing and plastic/t-tape & irrigation removal)
- Plot & plot border management (mowing, spraying, cultivation)
- Superintendent will manage PI funded students unless otherwise requested with task such as:
    - Plot set-up, maintenance, weed pulling, cultivation,
    - vine turning, driving stakes, tying vines, spraying
    - Laying plastic & t-tape & collecting harvest data
    - Plot clean up initial & final
- Farm staff will assist with all duties pertaining to plot such as:
    - Plot set-up, maintenance, weed pulling, cultivation,
    - vine turning, driving stakes, tying vines, spraying
    - Laying plastic & t-tape & collecting harvest data
    - Plot clean up initial & final
- Irrigation management based as equivalent to 1 inch per week-unless otherwise instructed
- Fertilization and pest management practices of vegetable crops will be based on the *Midwest Vegetable Production Guide for Commercial Growers* Purdue Extension ID-56 and Extensions Specialist recommendations.
- Pest management practices of vegetable crops will be based on Extensions Specialist, *Midwest Small fruit and Grape Spray Guide* Purdue Extension ID-169, and *Midwest Tree Fruit Spray Guide* Purdue Extension ID -168.
- Soil test will be performed fall prior to vegetable plot establishment using a plot random soil type grid
- Soil pH will be managed at 6.5 level based on fall soil testing
    - Vegetable plot fertilization will be a broadcast application using rates to maintain uniform N, P and K levels sufficient for vegetable production according to ID-56 and Extension Specialist recommendations for crop grown
- General crop scouting
- Maintain wildlife control
- Maintain adequate supply of hand tools (hoes, shovels, rakes, etc.)
- Maintain field operation records of task performed by farm staff

- Maintain farm applied pesticide application records and notification as required by WPS
- Equipment service and maintenance will be performed by farm staff (time, parts, and materials will be billed to investigator for investigator-owned equipment)

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Provide funding for labor for assistance with plot setup, planting, plot maintenance, data collection, harvesting and plot clean-up
    - *Funding amount to be determined by Superintendent based on amount of labor intense research*
- Provide trays, seed and growing media if farm is producing project transplants
- Provide material or funding for specific or specialized pesticides used in plots
- Provide funding for plastic & t-tape plus any expenditures over and above normal management practices
- Provide plot maps and specific management practices
- Provide funding for stakes and tying supplies for crops if needed
- Necessary marking of sub plots & treatments
- Treatment supplies, application labor, and management
- Specialized equipment (sensors, traps, plot harvesters, etc.)
- Conduct sample and data collection/analysis with student labor assistance
- Provide farm staff with all regulation guidelines associated with crops grown
- Inform farm staff of field operations performed by PI
- Inform farm staff of pesticide applications performed by PI (farm will forward information and notify other farm users as required by WPS)
- Provide farm staff with chemical label & MSDS sheets for any pesticides used on treatments
- Post information of pesticide applications made by PI at central location on farm in accordance with WPS
- Inform farm staff in timely manner when data collection is finished

***Tree/Grape Capacities, Recommendations, and Responsibilities***

In addition to the SWPAC capacities, recommendations, and responsibilities, these listed below also apply to the tree and grape plantings at SWPAC

Tree planting area is limited to Fields 28, 29, 30 & 32 (approx. 10 acres total) to allow for rotation of vegetable & row crop plots

Grape planting area is limited to fields; V1, V2 & V3 (approx. 3 acres)

**FARM RESPONSIBILITY**

- Manage irrigation on plots less than 3 years old unless otherwise instructed by PI
- Manage rodent control
- Pest management practices of fruit crops will be based on Extensions Specialist, *Midwest Small fruit and Grape Spray Guide* Purdue Extension ID-169, and *Midwest Tree Fruit Spray Guide* Purdue Extension ID -168.
- Assist with pruning of grapes as agreed upon with PI
- Manage spray applications & records
- Manage fruit harvest with PI assistance when needed
- Collect harvest samples and process PH levels, % brix & titration numbers

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Provide funding or supplies for trellising, post and or stakes
- Provide support for labor to prune, maintain vine growth, collect data, sample & harvest
    - *Funding amount to be determined by Superintendent based on amount of labor intense research*
- Provide materials or funding for pruning & tying supplies
- Provide material or funding to maintain harvest/sampling equipment

*Organic Vegetable Capacities, Recommendations, and Responsibilities*

In addition to the SWPAC capacities, recommendations, and responsibilities, these listed below also apply to organic plantings at SWPAC

Organic area is limited to Field 26 (approx. 1 acre) Plot area consist of 4-1/4 acre quadrants within this area and is determined with the amount and type of research performed each year.

**FARM RESPONSIBILITY**

- Maintain equipment and field operations record as required by NOP Standards
- Maintain farm purchased input records, labels, search records as required by NOP Standards
- Maintain crop rotation as determined by PI
- Assist with planting, data collection & harvest
- Assist with plot clean up

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Maintain investigator-purchased input records, labels, search records as required by NOP Standards
- Determine & maintain cover crop rotation in plots not used for vegetables
- Maintain materials and paperwork associated with Organic certification
- Provide farm staff with OMRI approved fertilizer & pesticides for applications
- Provide farm staff with chemical label & MSDS sheets for any pesticides used on treatments
- Post information of pesticide applications made by PI at central location on farm in accordance with WPS
- Assist with planting, maintaining, data collection, harvest & plot clean up
- Collect soil samples & provide soil fertility recommendations
- Collect annual water quality sample for certification

***High Tunnel Recommendations and Responsibilities***

In addition to the SWPAC capacities, recommendations, and responsibilities, these listed below also apply to studies conducted in high tunnels, low tunnels, or other 'protection' or 'season extension' structures

Current high tunnel assignment will be performed in accordance with SWPAP-based specialists with input from SWPAC superintendent.

**FARM RESPONSIBILITY**

- Perform necessary maintenance and repair
- Initial plot preparation (tillage, bed preparation)
- Assist with Irrigation set up
- Maintain 24 hr. water supply and access
- Final plot clean up (tillage) and planting of cover crop

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Provide funding for necessary maintenance and repair supplies and labor
    - Current occupant of tunnel will be billed for repair and maintenance supplies of individual tunnels
- Environment control (ventilation, temperature) management and application
- Provide funding for fertigation equipment
- Irrigation and fertigation management and application
- Plastic and t-tape
- Final plot preparation (planting, staking)
- Initial plot clean up (removal of plant material, plastic mulch, irrigation tape, twine)
- Provide farm staff with chemical label & MSDS sheets for any pesticides used on treatments
- Post information of pesticide applications made by PI at central location on farm in accordance with WPS
- Provide additional labor for major repairs (recovering) as requested by farm superintendent

*Greenhouse Operations and Responsibilities for SWPAC*

**FARM RESPONSIBILITY**

- Maintain adequate greenhouse facilities to produce healthy transplants for field production
    - Includes cleaning and sanitizing benches plus weed control
- Maintain disease & pest control
- Seed crops in a timely manner in accordance with project needs
- Maintain adequate water & temperatures for plant growth
- Maintain plants on weekends during growing season (March 1st – May 15th)
- Assist with setup & tear down of organic greenhouse

## Organic Isolation Procedures

- Plants are seeded in separate greenhouse used solely for organic production
- Plants are kept separated from conventional plants once removed from greenhouse
- Tray tags are marked as "ORGANIC".
- Organic fertilizer, seed and media is contained in separate containers with a sealed lids
- Potting benches are swept clean and sanitized when changing from conventional to organic potting media
- Vehicles used to transport transplants to field are swept clean prior to transporting organic transplants

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Provide necessary seeds, media & trays needed for seedling production
- Assist with seedling planting
- Assist with seeding
- Assist with weekend watering when needed

## Pathology Greenhouse

**FARM RESPONSIBILITY**

- Maintain adequate greenhouse facilities to produce transplants
- Maintain pest control
- Provide assistance with maintenance of greenhouse & swamp cooler

**INVESTIGATOR RESPONSIBILITY**

- Maintain adequate water & temperatures for plant growth
- Provide funding for 50% of propane usage
- Provide funding for maintenance expenses

*SWPAC Agronomic Crop Responsibilities (Corn, Soybeans, Wheat & Canola)*

These apply to agronomic crop plots at SWPAC

Plot locations will be assigned by SWPAC superintendent according to available space and plot needs with preference given to those who attend SWPAC Day-on-Campus

Land request form is required before space allocations can be made

Multi-year studies require a land request form annually

**FARM RESPONSIBILITY**

- Equipment Operation
  - Tillage, non-treatment spraying, cultivation, non-treatment fertilizer application, final plot clean up
- Non-treatment chemicals and fertilizers
- General crop scouting and note taking (growth stages)
  - unless other arrangements have been made in advance
- Plot border management (mowing, spraying, tillage)
- Equipment service and maintenance will be performed by farm staff (time, parts, and materials will be billed to PI for PI owned equipment)
- Final plot clean up management

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Plot maps
- Necessary marking of sub plots
- Treatment supplies and application labor/management
- Specialized Equipment (sensors, traps, plot harvesters, etc.)
- Investigator-purchased equipment service and maintenance expense (labor, parts, supplies)
- Sample and data collection/analysis
- Initial plot clean up (pulling stakes, flags, etc.)
- Provide farm staff with all regulation guidelines associated with crops grown
- Provide chemical labels & MSDS sheets of products used on plots
- Post information of pesticide applications at central location on farm in accordance with WPS
- Inform farm staff about visits to farm
- Inform farm staff when finished with data collection and/or plots

**FARM RESPONSIBILITY**

- Perform necessary preventive maintenance, service, and repair equipment (farm and PI owned)
    - Investigator will be billed for labor, parts, and materials
- Provide parts, repairs, supplies and hardware used on farm owned equipment
- Maintain adequate supply of general shop supplies (common fasteners, lubricants, cleaners, rags, safety supplies, necessary tools) needed for day to day operations.

**INVESTIGATOR RESPONSIBILITY**

- Account numbers must be provided to farm staff prior to any work being done or supplies ordered by farm staff
- Provide necessary manuals, diagrams, and layouts requested by farm
- Report any issues or breakdowns with equipment or infrastructure ASAP to farm staff
- Inform farm staff if equipment needs service or work