Washington State University Irrigated Agriculture Research and Extension Center (IAREC) Headquarters Unit Prosser, Washington

Master Plan June 2012

Washington State University Capital Planning & Development

Table of Contents

Subject	Page
Executive Summary	4
Master Plan Goals	
Master Plan Assumptions	5
Background IAREC Mission	6
History	7
Introduction	
Impact	8
Faculty and Staff	9
IAREC Units	10
H.P. Singleton Headquarters Unit	11
Campus Analysis	
Historic Development	15
Relationship of Location and Function	17
Access, Circulation and Parking	17
Infrastructure	19
Landscaping	21
Security	22
Campus Plan	23
Future	29
Recommendations	
Maps	
Addenda	

Addenda

Map 1	Campus Use Areas
Map 2	Campus Construction Periods
Map 3	Building Functions
Map 4	Access, Circulation & Parking
Map 4a	Campus Core Access, Circulation & Parking
Map 5	Visitor Arrival & Access
Map 6	Pedestrian Access & Circulation
Map 7	Utilities – Water
Map 8	Utilities – Power
Map 9	Utilities – Sewer
Map 10	Landscaping

Map 11 Master Plan

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Executive Summary

Washington State University, Irrigated Agriculture Research and Extension Center (IAREC), is headquartered in Prosser, Washington. Since its beginnings in 1919, this center has provided research, development and extension services to the irrigated agriculture industries of Washington. These industries accounts for over five billion dollars in annual revenue to the state.

Research and development at IAREC has had a major impact. The wine industry in Washington has had double digit annual growth for the last quarter century due to discoveries and advances developed at IAREC. Likewise, the Washington tree fruit industry has seen major growth as a result of IAREC development of techniques for establishing virus-free trees. Water and soil conservation techniques developed at IAREC have significantly improved agricultural sustainability. Researchers have advanced the development of hops as an irrigated crop. Plant pathology research and the development of numerous new crop varieties adapted to conditions in the state have expanded the range of crops that can be profitably grown. And, the Washington State Ag Weather Net research program (AWN) has monitored global, regional and state weather patterns, allowing growers (particularly tree fruit) to make critical crop protection decisions.

IAREC is growing. Two large, new buildings were constructed in 2007 and 2008 to support expanding programs. Both facilities are currently crowded and planned, major additions to each are being requested. Completion of proposed construction would provide an important expansion and modernization of office and laboratory space. Research at IAREC is expanding and current and future programs are certain to require additional space.

Quality of campus life, safety and security will remain important elements of planning. And, it will be important to preserve the historic gardens and park-like residential and hospitality areas of an expanding campus.

Master Plan Goals & Assumptions

Master Plan Goals

Goal 1. To promote a vision for the IAREC Headquarters Unit that will accommodate the demands for evolving new technologies, while continuing to support traditional research, development and extension services.

Goal 2. To plan for future campus development that will support the multi-agency character of projects located on campus.

Goal 3. To recognize the growth and change in communities surrounding the campus, and provide for a campus environment that supports industry research projects.

Goal 4. To maintain open space and pedestrian areas, and provide opportunities for public interaction.

Goal 5. To address sustainable practices in both energy conservation and in technological practices.



Master Plan Assumptions

The importance of IAREC to developing Washington State's agricultural industry is ongoing and evolving, both with the industry, and with the possibilities made available by new research and technology. In developing this Master Plan a number of assumptions will be used:

- The rate of growth in the agricultural industry in Washington State will continue at its current pace.
- Water availability and its stewardship will be a significant limiting variable in agricultural growth.
- Energy conservation will continue to be a driving factor in the development of rural communities in Washington State.
- Research done at IAREC will further employ new, cutting edge technologies, placing new demands on facilities.

- Basic research discoveries will be translated into Research and Development applications and into Extension, generating expansion and evolution in support needs.
- IAREC will continue to be a multi-agency center.
- The rate of funding and opportunities for expansion and renovation will continue at, or above, current rates.

Background

IAREC Mission

The principle mission of Washington State University (WSU), Irrigated Agriculture Research and Extension Center (IAREC) in Prosser, Washington, is to assist the state's irrigated agricultural industry. It does this by supporting development and production of crops and supporting technologies that assure a safe, abundant and environmentally sustainable food supply.

This is being accomplished through:

- Research Discoveries -Disseminating new scientific knowledge to aid irrigated agriculture in optimizing yields and quality of products, while minimizing impacts on soil, water, energy requirements and environmental quality.
- Irrigation Technologies -Developing and disseminating methods to adapt irrigated agriculture production to meet market demands for ample supplies of high quality and safe products.
- Leadership Providing extension, teaching and service support programs to the irrigated agriculture industry. This is done in coordination with the WSU College of Agriculture, Human and Natural Resource Sciences (CAHNRS), the U.S. Department of Agriculture (USDA), and the Washington State Department of Agriculture (WSDA).

IAREC Provides Leadership and Extension to Washington farmers and the irrigation industry. Co-located with IAREC at Prosser is the Vegetable and Forage Crop Production Research Unit of the USDA Agricultural Research Service (ARS). Its mission is to develop profitable, sustainable and environmentally responsible management systems for the irrigated agriculture industry.

This is being done through:

- Germplasm Research -Developing enhanced alfalfa, bean, pea and potato germplasm for improved food and forage value, greater resistance to stress and reduced reliance on chemical pesticides and fertilizers.
- Farming Practices -Developing practices to reduce the impact of problems caused by plant diseases and weed competition on irrigated crops.
- Management Developing decision support technologies to assist with the management of irrigated crops.

USDA ARS scientists have been housed at IAREC since 1922, and are adjunct faculty for WSU. They form an important component of the interdisciplinary research teams. Federal scientists and administrative personnel work collaboratively with WSU personnel at Hamilton Hall. Much of the research equipment is shared between federal and state projects.



Counting plant pests and pathogens.



History

IAREC started as the Irrigation Branch Experiment Station, authorized in 1917 by the Washington State legislature. The first crops were planted in 1919. In the early 1900's, farmers in the Yakima Valley were starting to use irrigation to grow a number of crops new to the region. Successful use of irrigation was learned by trial and error, and was slow in developing. The soil lacked basic nutrients such as zinc and nitrogen. Day-long dust storms blanketed crops and topsoil. Weeds not only aggressively competed with newly planted crops, but choked canals. Some practices of that era wasted water and resulted in soil erosion. Local farmers requested assistance from their state representative. A bill to support development of the experiment station was passed, but no funding was appropriated until 1919. Over the ensuing 87 years, the center has continued to serve the irrigated agriculture industry, and has evolved into present day IAREC.

Agriculture in Washington State is an industry generating over 5 billion dollars annually. It is also one of the most diverse in the nation, producing over 200 crop species.

In 2002, approximately 23% of crop land in Washington was irrigated. Yet, nearly 70% of farm production value came from irrigated land, and nearly 43% of livestock products were produced in direct association with irrigated agriculture. In 2007 over three billion dollars in annual revenue is generated by more than 60 irrigated crops, grown on more than 15,000 Washington State farms that rely on irrigation.

1952 aerial photo of Headquarters Unit. View to the southwest.



Early irrigation practices. ca 1919.



Introduction

Impact

Many current practices used in central Washington agriculture derive in part from research conducted at IAREC. The importance of IAREC in the development of Washington's wine industry is broadly known as a premiere example of the impact that a Research and Extension Center can have on an emerging industry. Basic practices in viticulture and enology were developed at IAREC, and have been used extensively in developing this industry. Among states, Washington ranks second in production of premium wines, and is first in production of Concord grape juice. Washington's wine industry has grown 20% per year for the last quarter century.

IAREC is also recognized as the world leader in developing technology for establishing and maintaining virus-free fruit trees. IAREC research helped establish frozen apple juice concentrate as a major Washington product and developed the "Rainier" cherry as a high quality fruit product.



Molecular Biology. Emerging technologies support Research and Development.

Other contributions to the regions agriculture include:

- Development of improved hop varieties.
- Development of biological control strategies for the Russian wheat aphid.
- Development of disease resistant bean varieties.
- Development of plant disease control methods.

Today, cooperation between WSU, USDA-ARS, and WSDA is supporting new research and new development for the irrigation agriculture industry. IAREC functions much like a large, multidisciplinary program. Seven academic departments from the WSU College of Agriculture, Human and Natural Resource Sciences (CAHNRS) have faculty members or research programs located at the Prosser Center. The interdisciplinary programs support teaching, research and extension services, and include interagency work among scientists from the USDA-ARS, WSDA, EPA and the WSU Agricultural Research Center and WSU Extension.



In Vitro. Tissue culture of new grape varieties.



Ranier cherries. Fruit orchards contribute to the three billion dollars in annual revenue derived by irrigated crops in Washington State.

Faculty and Staff

WSU CAHNRS has 20 faculty at the Prosser Center. They represent departments of Animal Science, Biosystems Engineering, Crop and Soil Science, Entomology, Food Science and Human Nutrition, Horticulture and Landscape Architecture, Plant Pathology, Rural Sociology, and the Center for Precision Agricultural Systems.

An additional 12 scientists working for the USDA-ARS are Adjunct faculty in CAHNRS.

There are 70 permanent WSU staff supporting the faculty and programs. In addition, there are seasonally up to 150 temporary, hourly employees hired for research support and seasonal work. Many of these are area high school and college students.





WSU Faculty, Staff and Students.



Page | 9

Headquarters Unit

The H. P. Singleton Headquarters Unit is located on a 191-acre site approximately five miles northeast of Prosser, Washington. Its 70 acre central campus supports laboratory and office buildings, greenhouses, cold storage facilities, growth chamber buildings, a dormitory, and support facilities.

Approximately 120 acres are dedicated to field research and are under gravity, trickle and pressure irrigation. The headquarters unit operates an independent domestic water system, sanitary sewer system and boiler plant for steam heating.

Roza Unit

The Roza Unit occupies a 320-acre site located three miles north of the Headquarters Unit. It provides IAREC scientists with field research sites with gravity, trickle and pressure irrigation systems.

Pear Acres Unit

The Pear Acres Unit occupies 29 acres, three miles north of the Headquarters Unit. Pear Acres provides IAREC scientists with field research sites similar to those at the Roza Unit.

The Headquarters, Roza and Pear Acres Units are located north of Prosser, Washington, in Benton County.





The Headquarters Unit is situated at the heart of central Washington's irrigated agriculture, surrounded by commercial agricultural fields and orchards. The red line shows the IAREC boundary. Interior rectangle is USDA-ARS property.



Research plots at the Roza Unit (large rectangle) and research orchards of the Pear Acres (lower left) are clearly distinguishable from the large commercial fields surrounding the units.

Othello Unit

The Othello Unit is 427 acres located within the Columbia Basin Irrigation Project near Othello, Washington. This unit provides field research sites for faculty from the Biological Systems Engineering, Crop and Soil Science, Entomology, Horticulture and Landscape Architecture, and Plant Pathology departments. Additional faculty from the Pullman campus of WSU also use this unit. The Othello Unit supports cooperative projects with the Washington State Crop Improvement Association, to provide controlled locations for seed increase.



The Othello Unit is located near the junction of Highways 17 and 26, in Adams County, Washington.



The H.P. Singleton **Headquarters Unit**

The Headquarters Unit is located approximately five miles northeast of Prosser, Washington.

The main administrative offices for both IAREC and USDA-ARS activities are housed in Hamilton Hall, which also houses most of the molecular biology and tissue culture laboratories. Hamilton Hall anchors an Academic Area incorporating IAREC and USDA laboratories and greenhouses (Map 1).

A paved extension off of Bunn Road serves as the central axis of the campus, dividing the Academic Area from the older Industrial and Residential Areas. The residential core of campus provides dormitory housing for up to 17 resident students, and permanent housing for staff. The Residential Area provides a large park of turf and mature trees that connects housing with the Harold P. Willmsen Memorial Garden which includes the J. Paul Miller Peony Collection.



These historic, formal plantings anchor the southern end of the park and frequently serve as a focus for visitors. The garden and park are the first areas seen by visitors as they enter campus from the south.

The Campus Core of the Headquarters Unit. View looking to the southeast. Bunn Road can be seen extending south from the tree-lined main entrance. The irrigation canal seen in the upper half of the photo, forms the southern boundary of the Headquarters Unit.



Map 1: Campus Use Areas

East of the residential areas is the industrial core of agricultural operations. The majority of shops and storage buildings are located around a large equipment park. IAREC is relatively self sufficient, with a number of shops capable of supporting the demands of farm operations, irrigation and other agricultural facilities.

The graveled service core occupies the central drainage of IAREC and is built over storm drains that carry runoff into the canal. Buildings sit around the edge of this central depression which forms the steepest topography on the site. It is accessed from the campus core by a gravel road that enters the depression at its northern end. The constraint of topography has affected the patterns of development in this area, which in turn, has limited access from the campus core. This has further defined the Industrial area as distinct from the Residential and Academic areas.

Adjacent to the dedicated Industrial Area are pens and sheds that support the WCA/WSU All Breed Bull test feeding program.

The campus core is surrounded by research fields. These agricultural areas support dedicated research grape vineyards, hop fields and fruit orchards. They also support a variety of irrigation, communication and weather forecasting research and development projects. In addition, they support teaching and extension activities.



Campus Core. Aerial view of Headquarters Unit taken around 2000. North is at the top of this photograph.

Campus Analysis Historic Development

Development of the campus reflects the historic pattern of development in the agricultural research and extension services during the twentieth century. Significant building programs were implemented in the decades after World War II, with fewer capital projects in the following years. Additionally, the types of buildings constructed reflect the changes in biotechnology that have developed over the last four decades.

These themes are reflected in both the location and types of structures found at the Headquarters Unit. Significant reuse and renovation has conserved some structures dating from the 1919 start of the Irrigation Branch Experiment Station. Four percent of existing structures date from prior to 1940.

Initial construction followed the existing, north-south axis; with greenhouses and storage buildings placed on either side of the Bunn Road extension. The growth boom in the 1950's saw 25% of existing structures built around the earlier plan. In the 1960's an additional 40% of existing structures were built. However, these later buildings were smaller support facilities, built to infill the space added in the previous decade. One exception to this generality was the construction of Hamilton Hall built in 1963.

Only 22 of the 94 existing structures at IAREC, have been built in the decades since 1970. However, these reflect the change in priorities at the research center, accommodating success in both developing the wine industry in Washington State, and in incorporating the latest biotechnology into methodologies supported by these structures.

Map 2: Construction Periods



The newest buildings reflect this trend. The Faulkner Hops Research Building and attached greenhouse were built in 1992 to support that program. The Hazardous Waste Facility was constructed in 2002 in support of campus research activities.

The Viticulture and Enology Building was constructed in 2006 to support research in the Viticulture and Enology programs. The Agricultural Technology Building houses the Center for Precision Automated Agricultural Systems.

New capital development has been exclusively in the academic area, west of Hamilton Hall. This pattern will locate research using current technologies in close proximity to existing laboratories and USDA, ARS facilities.

Relationship of Location and Function

The relationship of facility location with research and development functions can affect interaction between programs requiring similar laboratory and technology support.

Existing laboratory research is housed in Hamilton Hall, with a variety of testing and development laboratories housed in various buildings within the Academic Area.

Research materials from laboratories are transferred into growth chambers or greenhouses, before field testing. For example, sterile tissue cultures are at risk when they must be are moved from Hamilton Hall to growth chambers located in the Faulkner Hop Research Building. The requirement to support these facilities with electricity, heating, air conditioning and clean conditions is marginally met.

Current grouping of new facilities near Hamilton Hall and near the USDA facilities will facilitate synergy by locating advanced methodologies within the same building or nearby facilities, keep graduate student near their faculty and make information technology connections available. Planned second phase construction at the ATB and V&E Building will be critical to maintaining this proximity.



Map 3: Building Functions



Agricultural Technology Building. The Agricultural Technology Building was constructed in 2008 and houses the Center for Precision Automated Agriculture Systems. The building is currently overcrowded and the planned addition of 13,000 sf will provide office space for personnel currently housed in shop and laboratory areas as well as in temporary mobile office units.

Access, Circulation and Parking

Roads, Pedestrian Walks and Parking

The Headquarters Unit is accessible from the north, and south approaches to the property. The main, public entrance is from the south, on Bunn Road, which forms the only crossing of the Sunnyside Canal along the southern border of the property. A paved extension of Bunn Road forms the central drive, which bisects campus, ending near the northern end of the Academic and Residential Areas.



A single, paved parking lot connects to the central drive, and provides parking for 60 vehicles adjacent to Hamilton Hall and the Viticulture and Enology Building.

Map 4: Access, Circulation & Parking

This parking is used primarily by visitors, and by commuters working in adjacent buildings.

A two lane, gravel road extends north, from the paved end of Bunn Road to the northern entrance of the property. This extension connects with McCreadie Road near the northwest corner of IAREC. A small gate secures this "back door" to the site.

Paved walkways serve pedestrian traffic in the residential area and in the campus core. Hamilton Hall and research facilities adjoining Bunn Road are served by paved sidewalks, as are many of the USDA-ARS facilities. Beyond this central core, pedestrian traffic shares the gravel drives with operations vehicles, or crosses the maintained lawns.



Main Entrance. Looking North from Bunn Road along central axis of campus. Hamilton Hall is on the left, memorial gardens on right.

Map 5: Visitor Arrival & Access



Circulation

A consequence of this linear arrangement is that there is no traffic circulation through the campus core. Delivery, service and emergency vehicles must use the parking lot to turn around, or must exit to the north on the gravel extension.

Internal circulation by farm and maintenance equipment is entirely on gravel driveways extending between structures in both the Academic and Industrial Areas. As a consequence, there is significant freedom of movement within these areas, but only for local operations. Graveled driveways or equipment parks are used for parking by commuters who work near by.

The Industrial Area has no paved walkways, although most buildings have a landing or loading dock. The parkland and paved walkways of the Residential Area serve to provide pedestrian connection between industrial and academic areas of campus.

Perimeter

The north boundary of the campus borders McCreadie Road, the east boundary borders McDonald Road, both paved county roads. Immediately adjacent to these paved roads is an unpaved, perimeter road circumscribing the IAREC research fields, connecting with numerous interior roads and tracks, and ultimately with the campus interior. This perimeter road is separated from the pavement by a light duty, farm fence, and no drainage ditch. This has the affect of leaving the perimeter entirely open to public access.





Map 6: Pedestrian Access & Circulation

Boundary Road. Northern and eastern perimeter roads are separated from county roads by light fence. View looks east along McCreadie Rd. IAREC research fields are on the right.

Infrastructure

The infrastructure at the Headquarters Unit reflects the growth and development of the campus over the last eight decades. Age, location, and condition of utilities parallel patterns of construction. Modernization of utilities has been ongoing.

Water

Two wells (#2 and #4) provide the source of water for the headquarters Unit. Located on the northern boundary of the property, they supply water for both irrigation of research crops and for domestic use. The Certificates of Water Right were granted by the State of Washington for well #2 in 1954 and for well #4 in 1979. Well #2 is appropriated for a maximum of 100 gallons per minute and a maximum of 32 acre feet per year. Well #4 is appropriated for a maximum of 100 gallons per minute and a maximum of 65.5 acre feet per year.

In 2003, the first of a multi-phase upgrade to the domestic system was completed. This included new main lines from the wells into the northern campus core, and automation of the pump house serving the well system.

This was followed by completion of Phase 2, in 2005. This improvement extended new distribution lines, connecting Phase-1 improvements with the southern campus core and recent construction.

These two upgrades have replaced much of the original main lines supplying domestic water.

Power

The Headquarters Unit receives electrical power from the Benton Public Utility District service area. Upgrades to primary lines serving the campus were completed in 2002.

Liquid Propane

In addition to electricity, a number of activities, including research laboratories, require propane gas for their applications. This is supplied from storage tanks situated in five locations on campus. Tanks provide service through underground pipes.



Map 7: Utilities - Water

Water Supply. Water tower and renovated pump house are located with wells at northern boundary of the Headquarters Unit.



Steam

Steam is still used at some locations, and is powered by an oil burning steam plant. Oil is stored in an underground tank next to the plant.

Both liquid propane and fuel oil are delivered by truck.

Sewers

As with power and water service, sanitary sewer lines have been significantly upgraded. In 1995, a new, larger drain field was installed southwest of the Industrial Area. This has augmented the original drain filed located south of the memorial gardens near the campus entrance. A large, double septic tank was located between these two fields and is served by a network of upgraded sanitary sewer lines.

Expanded capacity has set the stage for recent construction, but, it has also removed these areas from use for other purposes.

Stormwater

Much of the stormwater received at the Headquarters Unit is allowed to infiltrate into the soil. Most of the older structures and greenhouses empty runoff directly on site. This is significantly facilitated by the permeability of most surfaces.

One exception is in the steeper, Industrial Area where building drains empty into a central culvert serving the northern swale and wetland. The slope and compaction of the central equipment park, along with large roof areas, require conveyance. Stormwater from this area empties into the Sunnyside Canal immediately south of the Industrial Area.



Map 8: Utilities - Power



Map 9: Utilities - Sewer

Landscaping

Landscaping of the campus core consists of relatively large mature trees and shrubs reflecting various periods of campus development. Structures built in the last five years have no formal landscaping beyond turf grass.

Mature, mostly deciduous, trees are concentrated along the central axis of campus, and in the Residential Area. These canopies substantially contribute to the park like atmosphere of the campus, and provide much needed shade during summer months.

Nearer buildings, small trees and larger shrubs provide foundation plantings. Many of these are coniferous. They provide an ornamental aspect to the older buildings and help shade the south side of structures.

The boulevard of mature deciduous canopies frames the main entrance and central drive. This is one of the first views seen by visitors to the Headquarters Unit as they approach the campus core.

Columnar junipers and low hedges border the memorial garden on the east side of the entrance. This formal garden is a destination site for visitors to campus The rose and peony gardens were established as a gift from the estate of Harold E. Willmsen in 1964. The gardens have been maintained through volunteer efforts by both community groups and the faculty and staff at IAREC.

Ornamental plantings in conjunction with older trees connect the memorial garden with the Hospitality Area, another destination site for visitors. BBQ's and outdoor gatherings include industry representatives, local businessmen, legislators, and growers. Such gatherings enhance communication between producers and scientists. Commodity commission funding has become increasingly important in recent years, and such hospitality supports these efforts. Much of the pleasant atmosphere of the Hospitality Area is set by its landscaping.

Map 10: Landscaping



Lighting

Lighting of the campus core is accomplished by both pedestrian street lights and building security lights. The quality and placement of such lighting reflects the periods of campus development. Few older building have illuminated doors and grounds. Buildings constructed or renovated more recently have several exterior lights at doors and sensitive areas. The majority of lighting is in the campus core, with larger security lights placed on power poles in the Industrial Area. A schematic representation of exterior lighting shows numerous poorly lit areas. USDA-ARS area lighting is not shown, and will contribute marginally to illumination of WSU areas. Although greenhouses will contribute some lighting while their interior lights are on, trees and shrubs will tend to block area lighting and form additional deep shadows on campus.

The modest availability of exterior lighting carries implications for security, safety and future planning.



Security

The Headquarters Unit is entirely open on three sides. Additionally, the main entrance is not lit or gated, and the gate at the north entrance road is not substantial. Anyone with a pair of pliers can drive onto the campus at any point, from any of the paved roads bordering the property.

While street lights are used on campus, there is no resident staff on duty after hours. Resident students and employees working late must rely on each other and provide their own security.

911 service is available. Fire and Police services are available in Prosser, approximately six miles from campus. Washington State Highway Patrol and the Benton County Sheriff's Department should also be available if they are in the vicinity. No patrol of campus is provided by any agency.

Ground ambulance and fire service is available with a response time of about 10 minutes. Air ambulance service is available out of Tri-Cities, with a response time of approximately half an hour. However, no helicopter landing site has been established, and no ground transport vehicle has been designated and equipped to evacuate injuries to pick-up locations.

WSU does not operate a first aid facility, or clinic, at IAREC; although an emergency response team is available with medical kit, during the day. At present, there is one EMT certified employee at the Headquarters Unit, during the day.

Schematic of Exterior Lighting.

Campus Plan

IAREC is growing. New employees, support of successful programs, and future research opportunities will require improvements in utilities, circulation, parking, and modern research and office space.

Proposed Construction

Nine projects are currently either proposed or planned. These are labeled as "A" through "H" on the 10-Year Master Plan.

A – *Circulation and Parking* Proposed creation of traffic circulation and additional parking within campus core.

 $B_{1,} B_2$ – Hamilton Hall Addition Planned construction of research laboratory addition on Hamilton Hall.

C – *Viticulture and Enology Building, Phase II Addition* Planned addition of office space on Viticulture and Enology Building. Additional programs need the planned second phase.

D – Greenhouse Construction Planned completion of remaining greenhouses in association with Viticulture and Enology Building.

E – Growth Chamber Building

Proposed construction of new tissue culture and growth chamber building.

F – Student Residence

Planned construction of new resident student dormitory (17 units proposed).

G - *Hop Research Greenhouse* Proposed construction of additional

greenhouses to support hop research.

H- Agricultural Technology

Addition Additional space for the Center for Precision and Automated Agricultural Systems and the Washington Agriculture Weather Net. The addition is a planned second phase of construction.

Map 11: Master Plan



Map 11: Master Plan

Support of Existing Programs

Viticulture and Enology Building (C) The main building was completed in 2008. The planned addition will complete the previously designed office wing on the south side of the building. The office will provide space for graduate students and add space to the west side of this facility to accommodate expanding research needs in viticulture and tree fruit. This project will also add 14 additional parking spaces, and create an axis for future development of traffic circulation around Hamilton Hall.

Greenhouses (D)

In conjunction with the Viticulture and Enology Building, three new greenhouses will be constructed. Construction of the first greenhouse was completed in 2007, with the remaining two greenhouses constructed as soon as funding becomes available.

Growth Chamber Building (E)

Current research programs utilizing growth chambers have an increasingly pressing need for a purpose-built facility to house these large pieces of equipment. They require substantial amounts of electricity and generate quantities of heat. Currently housed in a wing of the Faulkner Hop Research Facility, utilities are marginally capable of supporting demands.

Landscape & Lighting

New construction will require the addition of landscaping and exterior lighting.

H- Agricultural Technology Building (ATB)

The planned second stage of construction for the ATB will provide more space to accommodate the Center for Precision and Automated Agricultural Systems (CPAAS). The center works closely with the Washington tree fruit industry to develop automation systems for increased efficiencies in crop production and protection.

The second phase will also add additional office and conference room space needed by the Washington State Ag. Weather Net research program (AWN). This program monitors global, regional and state weather patterns and transmits weather data to growers (particularly tree fruit) that allow them to make critical crop protection decisions.

Research led by these two programs is critical to maintaining the ability of the multi-billion dollar tree fruit industry to remain competitive in the global marketplace. Advancements in robotics have the potential to enhance worker safety and augment demands on labor during critical production cycles. Growth Chambers (E). These large incubation chambers require significant utilities support. A large number of such chambers support research.





Viticulture and Enology Bldg. (C). View to the southwest from Hamilton Hall.

Support of Expanding Programs

Circulation & Parking (A)

Expansion in both the WSU and USDA-ARS employee populations is anticipated in the coming years. Coupled with the lack of circulation and modest parking at the campus core, addition of a paved road and additional parking is proposed around Hamilton Hall and the Viticulture and Enology Building.

Hamilton Hall Additions (B)

Two additions are proposed for Hamilton Hall. These are envisioned to contain laboratories designed to support current and emerging new biotechnologies. There is a current need to expand facilities that can supply the utilities and power requirements of such facilities; to provide clean or sterile working conditions, atmospheric control, and locations for such equipment as ultra-low (-80°C) freezers and growth chambers. Two stages are proposed ("B1" and "B2" on Master Plan) for these multi-story additions to Hamilton Hall.



New Dormitory (F)

Construction of a new dormitory would provide residential housing for additional WSU students. Expanding research programs are able to accommodate these new students, and on-campus housing is needed.

Hop Research Greenhouse (G)

Expansion of research programs will require addition of new greenhouse space in the coming years.

Dormitory (F). Existing building houses 12 resident students. A similar building is proposed.

Building on these sites expands the academic area away from the congestion of the campus core and focuses new construction adjacent to the USDA,ARS facilities. This will conserve the ornamental and parklike character of the Residential Area and Memorial Gardens. It will also concentrate laboratory methodologies, and their support requirements, in closer proximity to each other; and facilitate delivery of support services.



Hamilton Hall (A & B). The south side of Hamilton Hall is the location proposed for addition of a new research wing; as well as parking and a circulation road. View looking north from main entrance.

Demolition

Two structures have reached the end of their service life, and need to be removed.

Kjeldahl Building (a)

This building is no longer used for the chemical procedure after which it was named. More importantly, the Kjeldahl procedure resulted in contamination of the building with asbestos and heavy metals. Hazardous materials evaluation, mitigation and disposal will be required.

Removal of the Kjeldahl building would open future development space north of the East Building. This could allow expansion of the East Building, or provide space for new facilities. Its location between the residential and industrial areas, and its proximity to research activities in both the North and East Buildings, provide several opportunities for use of this site.

General Storage Shed (b).

This long, storage shed was constructed of wood in 1952. It is one of the older storage sheds remaining in the Academic Area. Deterioration and demand for increasing maintenance recommend its removal.

Demolition would open space for infill development north of Hamilton Hall, and adjacent to USDA-ARS facilities. As an example, this location could be used for construction of a new Growth Chamber Building.

Remodeling

Remodeling of existing buildings will allow development of additional housing. Remodeling of the Main Maintenance Residence has allowed conversion of this building into a married student residence.

Kjeldahl Building (a)



Storage Shed (b)



Future Development Sites

The campus provides a number of excellent locations for future development. Future expansion may result from several types of opportunities such as: providing modern space for existing programs, providing space for new basic research and R&D programs, providing new space for Extension and commercial activities, and providing housing and security. Additionally, the introduction of new technologies into research programs will require planning for purposebuilt structures capable of supporting laboratory and R&D methodologies.

Factors limiting expansion in the campus core include limited available space in the entrance area; limited access, circulation and parking; utility requirements; and the importance of preserving the memorial garden and open space of the Residential Area.

Recent expansion has taken advantage of open space to the west of Hamilton Hall to construct the Viticulture and Enology Building and the Agriculture Technology Building. These buildings take advantage of proximity to the USDA, ARS facilities, and have began to lay out and implement some paved traffic circulation within the campus core. Continued expansion of facilities supporting basic research and R&D is most appropriate to the south and west of Hamilton Hall. Expansion would continue the integrity of the Academic Area and allow activities with similar structural and support needs to be located near each other.

The single, main entrance on Bunn Road provides an opportunity for creating a formal entrance and development of a public area separated from the campus. The advantages would be increased security and provision of additional traffic management. Proximity to the memorial gardens and open space along Bunn Road provide space for public activities. The mission of IAREC, to support the state's agricultural industry, requires significant cooperation and interaction with the state's farmers and industry representatives. Current facilities for on-site conferences and workshops are minimal.

Greenhouse, storage and R&D laboratory facilities can expand to the north and west of existing greenhouses and greenhouse support facilities. Similar utility, access and maintenance needs would be shared with these existing structures.

Upgrading or expansion of service support facilities in the Industrial Area does not appear to be a significant requirement. The campus is relatively self sufficient, and much of the maintenance and construction trades are already present. Any additional development would be within the perimeter of the Industrial Area. Land to the south and west of this site is restricted by the location of a large drain field, the canal and the cattle feeding pens and sheds. Development is restricted to the north by the drainage channel, and to the east by the Residential Area.

Future Challenges

Evolution of Research Programs, Impact of Technologies and Funding

The interrelationship of funding sources, research program development and emerging technologies will impact campus planning and development.

Evolution of research funding will impact housing and support requirements. In 2006, 53% of research support came from state or federal funding, while 44% came from commodity commissions or private sources. This reflects a 30% decrease in state funding and a 20% increase in commodity commission funding since 1992. As grant funding continues, or increases, in its importance, funding agencies will impact future program development.

Most grants at IAREC, for example, are obtained from commodity commissions. These groups have stepped into support research, as state funding has decreased over the previous decades. This has the advantage of supporting research, enhancing communication between producers and scientists, and providing immediate feedback of new findings and technologies to the grower community.

A consequence is that program development at IAREC will reflect priorities of the commodity commissions. As emerging technologies become increasingly important to funding sources, success of grant funding will reflect the success of IAREC in being prepared to support new research initiatives. Campus planning for the next decade should reflect the impact of these evolving priorities.

Rear Entrance

Growing Resident Population and Security

Success of research and teaching programs is being reflected in a growing student population on campus. On average, 15-20 WSU students are pursuing degrees while conducting research at IAREC. Of these, there are spaces for 15 to live in student housing at the Headquarters Unit.

The proposed addition of eight residences for post docs and the addition of married student housing, would potentially bring the resident population to a 23 headcount if all units were filled.

The absence of permanent WSU staff on campus after hours, the open nature of the campus, modest lighting, and absence of after-hours medical and security presence should be addressed.



Research Equipment



Weather Station



Future Issues

The future of IAREC research will certainly include traditional projects in support of the agriculture industry in Washington State. New technologies and new markets will open additional opportunities for research and development. Among these are:

- Production practices for crops that result in bio-fuels.
- Introduction of canola as an irrigated crop.
- Integration of new technologies and agricultural practices for farm production.
- Development of new plant varieties using both traditional breeding methods and new biotechnologies.
- Development of methods for recycling or disposal of agricultural wastes.







Sustainability and Energy Conservation

Public utility systems are an outgrowth of the agricultural community cooperatives. Granges have historically been the drivers for persuading various rural electrical companies to bring power to the rural areas. Through their persistence, the Columbia hydro system became the public resource that we have today. In the 1920's rural cooperatives and public utility districts were created to move electricity into the market where it was not cost effective at the time. In hindsight, this was one of the greatest economic development strategies for rural communities of the 20th century.

Prosser's unique landscape offers an important opportunity for the use of renewable energy resources such as wind and solar energy, as well as developing future energy and water conservation technologies. Creating renewable energy models that are in the interest of the local communities in Washington could become a mission of IAREC.

For example, the agricultural community could benefit from wind power's many economic and environmental attributes. To list a few benefits:

- Wind energy can provide an additional source of income for rural communities, benefiting, county and local services (schools, health care facilities, roads, etc.).
- Wind energy uses less water to produce electricity than fossil fuels.
- Wind turbines do not prevent crops and livestock from being managed, right up to the tower base.

Through conservation savings, wind and solar power generation can help communities become more self-sustaining by supplying energy locally and selling excess energy to power companies.

The challenge is to blend renewable energy resources with conservation savings so that the new systems become economically attractive. IAREC is in a landscape that offers excellent access to the newest technologies through the WSU Energy Program, a self-supported department within the university's Extension Service. A stronger relationship between these two entities could provide a well-focused and progressive program that would demonstrate sustainable principles for rural communities across the Pacific Northwest.



Through conservation savings, wind and solar can help communities become more self-sustaining.



Wind turbines do not take up much land. Crops can be grown and livestock can be grazed up to the turbine base.

Recommendations

There will be an ongoing need for greater productivity from the land with the demands of an increasing population in the Pacific Northwest. For example, diversity in diseaseresistant crops, and efficiency in the use and conservation of chemical and water resources are increasingly sensitive topics. As such, the role of IAREC will be significant as an agricultural research center for the developing WSU regional presence.

The following recommendations offer some guidance to support future research demands for funding and decisions.

New Construction: Continue to place new construction to the south of the USDA,ARS area, and west of the central

- axis.
- Safety and Security: Prepare a Safety and Security Plan for the campus.
- Enforcement: Coordinate with local law enforcement and emergency responders to prepare contingency plans and increase security presence on campus, especially after hours.
- Utilities Plan: Prepare a utilities plan for use in planning for expanding services to dorms, labs and offices as the campus grows.
- Landscaping: Preserve existing landscaping and the Memorial Garden. Expand landscaping to support new construction.

• Wayfinding and signage:

IREC has become a large enough facility with enough complex components and buildings that a signage and wayfinding system should be established and followed as new buildings come on line. It is particularly important for IREC to place signage that has the WSU crest at the interstate exits so that visitors can more easily find the research center and so that the presence of WSU is clearly identified. Consistency of this message is important for the WSU image across the state.

The opportunities for growth at IAREC are evident when the surrounding community and region are considered. Growth in the wine industry will have a significant impact on how WSU - Prosser develops. Based on emerging technologies and the ability of IAREC to secure funding, the future for development is promising. ADDENDA





Map 2: Construction Periods



Map 3: Building Functions





Map 5: Visitor Arrival & Access



Map 6: Pedestrian Access & Circulation









Map 10: Landscaping



Map 11: Master Plan