V(A). Planned Program (Summary)

1. Name of the Planned Program

Plant and Soil Management in Agricultural Systems

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
<th>%1862 Extension</th>
<th>%1890 Extension</th>
<th>%1862 Research</th>
<th>%1890 Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>Soil, Plant, Water, Nutrient Relationships</td>
<td>57%</td>
<td>57%</td>
<td>57%</td>
<td>57%</td>
</tr>
<tr>
<td>205</td>
<td>Plant Management Systems</td>
<td>18%</td>
<td>18%</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>511</td>
<td>New and Improved Non-Food Products and Processes</td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

<table>
<thead>
<tr>
<th>Year: 2007</th>
<th>Extension</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1862</td>
<td>1890</td>
</tr>
<tr>
<td>Plan</td>
<td>6.0</td>
<td>2.9</td>
</tr>
<tr>
<td>Actual</td>
<td>0.3</td>
<td>1.2</td>
</tr>
</tbody>
</table>

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

<table>
<thead>
<tr>
<th></th>
<th>Extension</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith-Lever 3b &amp; 3c</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1890 Extension</td>
<td>0</td>
<td>155363</td>
</tr>
<tr>
<td>Hatch</td>
<td>1255257</td>
<td>0</td>
</tr>
<tr>
<td>Evans-Allen</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

V(D). Planned Program (Activity)

1. Brief description of the Activity
Program participants are working to develop and apply the best tools of contemporary plant and soil sciences to address the challenges and opportunities facing the agricultural industry and natural resource communities of Oregon through field and laboratory research. Investigators in the nutrient management subprogram developed guidance for land application of byproducts, and produced a calibrated soil test that accurately predicts spring fertilizer rate, analyzed plant nutrient tissue and uptake to determine the levels of potassium and sulfur fertilization effect on yield, quality and nutrient uptake of plants. Investigators in the plant management subprogram conducted field trials to develop new alfalfa species and varieties adapted to Central Oregon. On-farm trials were used extensively to assist grass seed growers in developing economically and environmentally responsible spring-applied nitrogen management programs. Preliminary studies will examine Russian dandelion as a potential source of high quality rubber as well as other alternative corps for the semi-arid climate and soils of Southern Oregon. Investigators in the technology subprogram developed a mapserver application that analyzes quantitative tolerances and functions for depicting areas for forage, biofuels and invasive species. Information was disseminated at grower meetings, experiment station field days and tours, national conferences and commodity commission meetings and through the Web. Results were published in journals, monographs and books.

2. Brief description of the target audience
   Professional peers, scientific communities and agricultural representatives
   State commodity commissions, grower groups, trade organizations
   Natural resource industry clientele – growers, field representatives, grower coops and partnerships, processors and handlers, export companies, importing companies
   County, state and federal agencies – Oregon Department of Agriculture, Natural Resource Conservation Service, Soil and Water Conservation Districts, urban biosolid handlers,
   Undergraduate and graduate students being trained in extension and research activities

V(E). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons (contacts) reached through direct and indirect contact methods

<table>
<thead>
<tr>
<th>Year</th>
<th>Direct Contacts Adults</th>
<th>Indirect Contacts Adults</th>
<th>Direct Contacts Youth</th>
<th>Indirect Contacts Youth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>750</td>
<td>5000</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>2007</td>
<td>1150</td>
<td>2700</td>
<td>75</td>
<td>200</td>
</tr>
</tbody>
</table>

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

<table>
<thead>
<tr>
<th>Year</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan:</td>
<td>0</td>
</tr>
<tr>
<td>2007:</td>
<td>0</td>
</tr>
</tbody>
</table>

Patents listed

3. Publications (Standard General Output Measure)

<table>
<thead>
<tr>
<th>Number of Peer Reviewed Publications</th>
<th>Extension</th>
<th>Research</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan</td>
<td>8</td>
<td>3</td>
<td>11</td>
</tr>
</tbody>
</table>

V(F). State Defined Outputs

Output Target
### Output Measure
- SCHOLARLY excellence in referred articles, book chapters, and books; participation on professional boards and panels, as well as science panels.

<table>
<thead>
<tr>
<th>Year</th>
<th>Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>33</td>
<td>40</td>
</tr>
</tbody>
</table>

### Output Measure
- DEVELOP IMPROVED ANIMAL AND PLANT PRODUCTION SYSTEMS - A comprehensive understanding of the morphological, physiological and/or genetic basis for plant responses in studied management systems to
  - nutrients
  - temperature, moisture and other abiotic stresses
  - plant growth regulators
  - attack by other organisms - Develop and promote strategies for nitrogen management, growth regulators, abiotic stresses, post-harvest management, and alternative crops for pest and weed management

<table>
<thead>
<tr>
<th>Year</th>
<th>Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>

### Output Measure
- DEVELOP BREEDING PROGRAMS THAT RESULT IN DESIRABLE TRAITS, CULTIVARS AND VARIETIES
  Work with plant breeding and genetics colleagues to release new varieties for general public and/or licensed release. Information on best management practices for new varieties will be developed

<table>
<thead>
<tr>
<th>Year</th>
<th>Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
V(G). State Defined Outcomes

<table>
<thead>
<tr>
<th>O No.</th>
<th>Outcome Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>New management systems will be developed and shared with end users; information will be adapted for use in other areas of the nation or world</td>
</tr>
<tr>
<td>2</td>
<td>New management systems will be adopted by end users</td>
</tr>
<tr>
<td>3</td>
<td>• Agricultural producers will realize greater economic return in their cropping enterprises;</td>
</tr>
<tr>
<td></td>
<td>• Plant nutrient and other production input use will be optimized</td>
</tr>
</tbody>
</table>
1. Outcome Measures

New management systems will be developed and shared with end users; information will be adapted for use in other areas of the nation or world.

2. Associated Institution Types

• 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantitative Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Program participants are working to develop and apply the best tools of contemporary plant and soil sciences to address the challenges and opportunities facing the agricultural industry and natural resource communities of Oregon through field and laboratory research.

What has been done

Investigators in the nutrient management subprogram developed guidance for land application of byproducts, and produced a calibrated soil test that accurately predicts spring fertilizer rate, analyzed plant nutrient tissue and uptake to determine the levels of potassium and sulfur fertilization effect on yield, quality and nutrient uptake of plants. Investigators in the plant management subprogram conducted field trials to develop new alfalfa species and varietals adapted to Central Oregon. On-farm trials were used extensively to assist grass seed growers in developing economically and environmentally responsible spring-applied nitrogen management programs. Preliminary studies will examine Russian dandelion as a potential source of high quality rubber as well as other alternative corps for the semi-arid climate and soils of Southern Oregon. Investigators in the technology subprogram developed a mapserver application that analyzes quantitative tolerances and functions for depicting areas for forage, biofuels and invasive species.

Results

The nutrient management subprogram developed new applied knowledge to guide beneficial use of byproducts from municipal, industrial and agricultural sources. Scientifically-based guidance provides economic benefits for byproduct generators and farmers, and assists in environmental protection through a reduction in excessive nutrient applications. New varietals discovered through the plant management subprogram increase profitability to growers through increased yields and, sometimes, a higher quality product. Also development of alternative crops will contribute to crop diversification in rural areas of Oregon, which should help stabilize the economic cycle. Investigators plan to release a new winter forage barley variety in the near future. Utilizing new technologies, such a mapping software, is beneficial to agriculture through improved management, more informed agricultural policies, and increased environmental sustainability.

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>205</td>
<td>Plant Management Systems</td>
</tr>
<tr>
<td>102</td>
<td>Soil, Plant, Water, Nutrient Relationships</td>
</tr>
<tr>
<td>511</td>
<td>New and Improved Non-Food Products and Processes</td>
</tr>
</tbody>
</table>

Outcome #2

1. Outcome Measures

new management systems will be adopted by end users

2. Associated Institution Types

• 1862 Research
3a. Outcome Type:
   Change in Action Outcome Measure

3b. Quantitative Outcome

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantitative Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>205</td>
<td>Plant Management Systems</td>
</tr>
<tr>
<td>102</td>
<td>Soil, Plant, Water, Nutrient Relationships</td>
</tr>
</tbody>
</table>

Outcome #3

1. Outcome Measures
   - Agricultural producers will realize greater economic return in their cropping enterprises;
   - Plant nutrient and other production input use will be optimized

2. Associated Institution Types
   - 1862 Research

3a. Outcome Type:
   Change in Condition Outcome Measure

3b. Quantitative Outcome

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantitative Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

<table>
<thead>
<tr>
<th>KA Code</th>
<th>Knowledge Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>205</td>
<td>Plant Management Systems</td>
</tr>
<tr>
<td>102</td>
<td>Soil, Plant, Water, Nutrient Relationships</td>
</tr>
</tbody>
</table>
V(H). Planned Program (External Factors)

External factors which affected outcomes
- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned
   - Evaluation Results
     - No Data Entered
   - Key Items of Evaluation
     - No Data Entered