

# Biotechnology & Genomics

Biotechnology & Genomics

## V(A). Planned Program (Summary)

### 1. Name of the Planned Program

Biotechnology & Genomics

## V(B). Program Knowledge Area(s)

### 1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
135	Aquatic and Terrestrial Wildlife			14%	
201	Plant Genome, Genetics, and Genetic Mechanisms			18%	
202	Plant Genetic Resources			2%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants			4%	
205	Plant Management Systems			4%	
206	Basic Plant Biology			10%	
215	Biological Control of Pests Affecting Plants			7%	
303	Genetic Improvement of Animals			11%	
304	Animal Genome			16%	
305	Animal Physiological Processes			3%	
502	New and Improved Food Products			2%	
511	New and Improved Non-Food Products and Processes			9%	
	<b>Total</b>			100%	

## V(C). Planned Program (Inputs)

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	2.0	0.0
<b>Actual</b>	0.0	0.0	4.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	295303	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	295303	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	49894	0

**V(D). Planned Program (Activity)****1. Brief description of the Activity**

In 2007 the NH AES had nine Biotechnology & Genomics research projects. Project 1 used a genomic approach and to examine bacterial-nematode interaction and identify genetic mechanism that predispose for mutualism or pathogenesis. Project 2 developed and applied genomic tools to identify genes responsible for desirable traits in strawberries and mint. Project 3 Used molecular biological techniques to study mRNA degradation in yeast. Project 4 used Arabidopsis as a model system to determine the role of protein phosphatase genes. In Project 5, genetic mapping was used to identify genes underlying sex differentiation and skin color of tilapia and to genetically improve tilapia for aquaculture. Project 6 measure charge on beta-lac A & beta-lac B under varying solvent conditions to determine the role of charge in protein functional properties. Project 7 performed experiments to comprehensively investigate the impact of genetic manipulation of a single step in the polyamine pathway in Poplar to determine its effect on other metabolic pathways. Project 8 performed molecular, biochemical and physiological research in sea lamprey; analyze data and screen genomes. Project 9 carried out experiments to determine the mechanism by which Vibrio fisheri regulates it key symbiosis operon. For all projects, presentations were be given at regional, national and/or international meetings and/or manuscripts were submitted to peer reviewed journals. Grant proposals have submitted. Undergraduate students, graduate students and/or postdoctoral fellows were trained through participation in the research projects and/or through incorporation of research findings in classroom instruction. In many cases, presentations were made to various traditional and non-traditional stakeholders.

**2. Brief description of the target audience**

Target audiences include students in university and K-12 classrooms; graduate and undergraduate students who have been trained through participation in the projects; attendees at regional, national and international symposia; readers of scientific journals, theses and dissertations in which project results have been published; visitors to websites developed by the project PIs and the NH AES; growers, producers and other stakeholders whose businesses will benefit from the investigations.

**V(E). Planned Program (Outputs)****1. Standard output measures****Target for the number of persons (contacts) reached through direct and indirect contact methods**

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	3600	4760	255	150
2007	0	0	0	0

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

<b>Year</b>	<b>Target</b>
<b>Plan:</b>	5
2007:	0

**Patents listed****3. Publications (Standard General Output Measure)****Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	0	17	0

**V(F). State Defined Outputs****Output Target****Output #1****Output Measure**

Peer-reviewed manuscripts

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	23	17

**Output #2****Output Measure**

Chapters in Books

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	6	0

**Output #3****Output Measure**

Author of book or editor

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	2	0

**Output #4****Output Measure**

Non peer reviewed publications including abstracts

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	28	8

**Output #5****Output Measure**

Identity and submission of cDNA, ESTs, proteins, genes, RNA to GenBank

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	50	71

**Output #6****Output Measure**

Websites developed and/or maintained

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	{No Data Entered}	4

**Output #7****Output Measure**

Total molecular sequence length (Mb)

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	{No Data Entered}	0

**Output #8****Output Measure**

Total number of direct participants in the project (this does not include audiences)

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	{No Data Entered}	36

**V(G). State Defined Outcomes**

<b>O No.</b>	<b>Outcome Name</b>
1	Peer Reviewed Publications
2	Public understanding of Microbial opportunists
3	Number of farmers considering biological control
4	Number of Readers of Peer Reviewed Publications
5	Number in audience of class or scientific meeting
6	Number of Graduate students trained in laboratories
7	Number of undergraduate students trained in laboratory; involved in investigations
8	Number of postdoctoral fellows trained
9	Number of users of released DNA sequences, germplasm; ESTs, proteins
10	Change in policy
11	Number of grant submissions
12	Number of meetings/workshops attended

**Outcome #1**

**1. Outcome Measures**

*Not reporting on this Outcome for this Annual Report*

**2. Associated Institution Types**

**3a. Outcome Type:**

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
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**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
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**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

Other (Technical challenges.)

**Brief Explanation**

In Project 9, completion of hypothesis driven mechanistic studies took longer than planned. This delayed the beginning of explorative microarray work.

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

**1. Evaluation Studies Planned**

Before-After (before and after program)

During (during program)

Time series (multiple points before and after program)

**Evaluation Results**

{No Data Entered}

**Key Items of Evaluation**

{No Data Entered}