Production Agriculture

Production Agriculture

V(A). Planned Program (Summary)

1. Name of the Planned Program

Production Agriculture

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
202	Plant Genetic Resources			5%	
205	Plant Management Systems			15%	
211	Insects, Mites, and Other Arthropods Affecting Plants			15%	
212	Pathogens and Nematodes Affecting Plants			10%	
301	Reproductive Performance of Animals			20%	
302	Nutrient Utilization in Animals			10%	
303	Genetic Improvement of Animals			5%	
304				5%	
307	Animal Management Systems			15%	
	Total			100%	

V(C). Planned Program (Inputs)

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	10.0	0.0
Actual	0.0	0.0	9.0	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	520610	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	1795817	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	1815722	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Production Agriculture

Conduct research; report results in scientific manuscripts and technical presentations; provide technology to users in popular publications and lay presentations

Both plant and animal agricultural production units in West Virginia are poorly positioned to compete in commodity markets for fruits, vegetables, field crops and livestock products due to a variety of circumstances includingsmall acreages and generally limited land resources, difficult terrain, relatively high prices for land suitable for row crops, limited availability and high cost of labor, etc.To remain viable, West Virginia producers typically must improve production efficiency either by increasing the value of what they produce, or by producing at a meaningfully lower price, or both.Specific strategies, reflected in the West Virginia Station's research portfolio, include avoiding enterprises which require extensive amounts of mechanical tillage or harvest; reducing costs of major inputs such as feed, labor and facilities; focusing on higher priced products such as those with ornamental or recreational use; increasing real or perceived product value in specialty, niche or out-of-season markets; diversifying product offerings; taking advantage of proximity to large urban markets, etc.,Said another way, our research activities focus on economic activities for which West Virginia producers have competitive advantage or at least are not competitively disadvantaged. Specific examples include cool water aquaculture, pasture raised and finished beef, out of season lamb production with predator control and internet marketing, organic production of vegetables and livestock, etc.

Aquaculture research in 2007 showed a heat tolerant strain of Rainbow Trout as well as stripped bass, to perform well in a year-around operation while hybrid bluegill has high mortality rates and largemouth bass grew poorly.A low-cost alternative to concrete construction for continuous-flow, raceway rearing systems was developed and a raceway economic and management simulation system for raceway production was tested and improved.Testing of alternative systems of utilizing waste, removed from fish raceway effluent, as nutrients for greenhouse plants were completed and technology developed for the recovery of significant proportions of fish lipid and protein currently discarded during processing.

Results of Station work to develop management systems for raising beef, birth to market, using pasture only has shown several systems able to achieve a target 0 .45 kg/hd/day gain under mild winter conditions but only one system (stockpiled forage + orchard grass haylage) that could do so under more severe winter conditions.Shopper surveys showed grass fed beef to be preferred by large majorities of consumers when served as both steak (74%) and ground beef (82%) if consumers are provided with nutritional information along with cooked samples for taste testing.Data suggested that grass-fed specialty meat products would have notable consumer acceptance at $4.00 to $11.00/kg above conventional beef prices.Supporting research is correlating pasture productivity with soil physical characteristics such as penetration resistance, texture, bulk density, etc.

Compost in the form of 10 tons/acre composted dairy manure compared with green manure from cover crops in the completely organic production of vegetables and livestock (sheep) and poultry showed higher soil organic matter, greater yields of potato, pumpkin, spinach and tomato, significantly lower incidence of spinach root rot, more lamb gain per acre, as well as higher soil levels of phosphorus, potassium, calcium and magnesium.Transplanting of pea and spinach avoids most root rot while planting seeds in compost layered in furrows produced best emergence and highest yields of the cultural practices examined.Organic poultry (broiler) production was successful without synthetic methionine and lamb infection with internal parasites was minimized through pasture rotations based on the parasite's life cycle.Additionally, lambs from ewes that received protein supplements prior to lambing were less likely to require antihelmintics, but lambs in flocks that were creep grazed were slightly more likely to require antihelmintics.

Station scientists have developed a new "paper pad" technique for fumigating honey bee hives with 50% formic acid.The treatment costs about $1.35 per hive, takes five minutes to apply, is complete in 24 hours or less, requires only one trip to the hives (all residuals are removed by bees), and exhibits average control of varroa mites in capped brood cells exceeding 96%.

A coordinated sheep breeding and management project has developed, refined, and assisted breeders with out-of-season breeding (for higher market price), ram soundness evaluation, pregnancy diagnosis (using ultrasound), predator control, parasite management, financial management, marketing, and pasture management. Pregnancy diagnoses suggest 2/3rd to 80% of sheep are bred out-of-season."Breeding age" and "all" sheep in West Virginia increased 1000 and 2000 head, respectively, while nationally the latter decreased by more than 100,000 head.

Neither embryonic nor fetal loss nor differences in pregnancy or prolificacy was associated with age of oldest follicle in sheep, in contrast to results in cattle.Microarray analysis of the CL in non-lactating beef cows revealed 134 up-regulated and 39 down-regulated genes and also determined up – and down-regulated genes for subcategories of genes involved in metabolism, transcription regulation and RNA processing, protein biosynthesis and modification, conferring antioxidant properties, encoding extracellular matrix and cytoskeletal protein, signal transduction, protein degradation, and DNA replication and modulation.

Understanding and control flowering and flower senescence would be of great benefit for producers of all crops (extending time for pollination) and ornamental flowers.Current research is examining the role of CEBP (nuclear encoded chloroplast protein expressed at a decreasing rate throughout flowering) as a possible flower senescence regulator.Recent results showed chlorophyll accumulation and number of chloroplasts decrease throughout flower development and senescence in epidermal cells in the lower part of flower petals (carnation) in a pattern reminiscent of CEBP accumulation and localization.

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Environmentally friendly methods of controlling brown stink bugs in peach and apple orchards using pheromone baited traps, with and without the presence of mullein host plants, demonstrated that stink bugs will aggregate in a small areal surrounding a baited trap but few will subsequently move from host plants to the trap in response to the pheromone.It was also shown that reducing the size of traps to the point of saving 43% of trap cost, did not significantly lower capture numbers. Similarly no difference in capture rate was found between branch mounted and suspended traps providing flexibility in trap deployment without reducing their effectiveness.

2. Brief description of the target audience

Producers, extension specialists, consultants, regulators, policy makers, researchers, rural public.

V(E). Planned Program (Outputs)

1. Standard output measures

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

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	0	0	0	0
2007	0	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2007:	1

Patents listed

Light weight alternative to concrete constructed fish raceway.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	4	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

Research manuscipts

Year	Target	Actual
2007	4	10

Output #2

Output Measure

Scientific presentations

Year	Target	Actual
2007	8	8

Output #3

Output Measure

Popular articles

Year	Target	Actual
2007	0	4

Output #4

Output Measure

Producer presentations, workshops, etc.

Year	Target	Actual
2007	0	0

V(G). State Defined Outcomes

O No.	Outcome Name
1	Growth in state production of beef and lamb %
2	Increase in production/consumption of pasture finished beef %
3	Increase in state aquaculture industry %
4	Increase state production and sales of organically produced vegetables %
5	Growth in state's ornamental horticulture industry %
6	Develop and market organic control for honey bee mites - adoption %

Production Agriculture
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

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area

V(H). Planned Program (External Factors)

External factors which affected outcomes

Economy
Competing Programmatic Challenges
Other (Changes/inconsistencies in measures of impacts.)

Brief Explanation

Two outcome measures were not measrueable while two others need to be collected for additional years in order to arrive at definitions consistent acrooss time and to demonstrate reliably accurate trends; adjustments will be made as necessary.

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

1. Evaluation Studies Planned

Before-After (before and after program)
During (during program)

Evaluation Results

None beyond measures of outcomes

Key Items of Evaluation

Environmentally friendly and healthy pasture finished beef was shown to have notable consumer acceptance with educated consumers willing to pay from $4.00 – 11.00/kg above conventional beef prices.

Station scientists have developed a new technique for fumigating honey bee hives with 50% formic acid – a treatment which costs about $135 per hive, takes five minutes to apply, is complete within 24 hours or less, requires only one trip to the fives, with average control of varroa mites in capped brood cells exceeding 96%.