Grant Project Title: A commercial demonstration of new technologies for producing walleye and hybrid walleye for stocking and food fish.
Amount of Funding Awarded: $20,000
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Please use the following questions as a guide for writing your grant project final report. In your final report, please answer each question as it relates to your grant project.

1) What was the original intent of the grant?

The goal of this project was to use a combination of recently developed technologies for demonstrating the commercial feasibility of raising large walleye and hybrid walleye in a single growing season for stocking and food fish markets. Also to demonstrate the applicability of utilizing recirculation systems for the production of hybrid walleyes and purebred walleyes for both markets. Providing fingerling walleye and hybrids to private growers for evaluation and development of an intensively reared broodstock for producing eggs and milt for later production purposes with private aquaculture interests was also undertaken with this grant.

- How was it expected to benefit Wisconsin Agriculture?
  Provides and demonstrates commercially the technology to produce two products for which strong markets exist, this project should lead to expansion of aquaculture industry and its profitability. Allows private growers to explore a potential new species without significant cash or equipment outlay.
- What makes this project work important or significant?
  Establishes and demonstrates commercial feasibility to produce walleye and hybrid walleye for both stocking and food fish use with a variety of systems both indoor and outdoor using new technologies.

2) What steps did you take to reach your goal?

Acquired walleye and sauger broodstock, hybridized walleye and sauger, spawned broodstock early and collected eggs, incubated and hatched eggs, feed trained larvae and raised fish to market size in RAS on commercial diets and in ponds on natural diets. Provided approximately 80,000 fingerling
fish for evaluation to > six commercial private aquaculture farms. Worked with private sport fishing
groups and local chamber of commerce to raise large 12-15 inch, yearly purebred walleye for
stocking into Lake Superior with great success(see attached article). Marketed hybrid walleye as
foodfish in conjunction with two commercial Wisconsin fish farms.

- What worked? Indoor spawning and larval rearing on formulated food. We were successful in
  raising walleye, hybrid walleye and sauger intensively on commercial diet utilizing an indoor
  RAS system. Large size and fast growth in short time period was crucial. First comments from
  industry collaborators indicate great market acceptance of ½ - 1 lb hybrids and good profit
  potential. Cooperators have reported good growth on hybrids in their systems.

- What challenges did you face? Collecting broodstock from multiple locations and states,
  acquiring proper permits and fish health assessments, spawning out of season, feed training
  larvae fish with specific feeds and methodology, specialized rearing tank conditions and cleaning
  systems, fin erosion and deformaties with purebred walleye, collecting data throughout the entire
  rearing time period. Transporting fish at appropriate time periods to private farms was difficult
  and needs to be refined to increase survival percentages.

- What would you do differently? Collect broodstock in fall or raise intensively, modify clean and
  feed management schemes, lower density of small fish in tank earlier, run higher densities of
  larger fish in RAS tanks, ship fingerlings sooner or possible provide eggs to growers for rearing
  as well.

3) What were you able to accomplish? Successfully raised hybrid walleyes and purebred walleyes to
market size (3/4-1.0 lb) in 1 year intensively in a heated water recycle system utilizing new
 technologies and supplied them to processors for market analysis. Successfully collected and
 spawned walleye and sauger early out of season utilizing a variety of methodology and created
 hybrid walleye (saugeye) for food fish production. Developed and implemented growout protocols
 for rearing of saugeye and walleye in a recycle water system. Successfully provided fingerling
 walleyes and hybrids to private growers for evaluation in their systems. Successfully worked with
 cooperators to stock large yearling walleyes grown intensively on formulated feed into lakes.
 Interested several potential large aquaculture groups into investing in this technology and species in
 Wisconsin with new operations.

What are the results from this project? Continued collecting rearing and marketing data indicating
this as a successful new potential aquaculture species for food fish and stocking industry. There
appears to be great potential with the hybrid walleye and the food fish industry. Successful
involvement from Wisconsin aquaculture facilities has made this a large success and several
facilities, existing and new, are looking at this as a new endeavor due to this research.

Outreach/Extension
This information has been presented to the industry and others by UWSP-NADF Technical staff at the following
conferences and workshops:
2011 Wisconsin Aquaculture Association Annual Conference, Pawukeye, WI
2011 UWSP- NADF Field Days Workshop/Conference, Bayfield, WI
2010 Midwest Tribal Aquaculture Workshop(UWSP-NADF), Bayfield, WI
2010 International Recirculating Conference, Roanoke, VA
2010 Native American Fisheries and Wildlife Conference, Fond Du Lac, WI
Daily Press article, Thursday, September 1, 2011.
Multiple tours and workshops with emphasis on the walleye/hybrid rearing project throughout the year conducted by technical staff at NADF.

4) What conclusions can you make based on project work the analysis of collected data? Hybrid walleye can be successfully raised to market size in 1 year in an RAS and may prove to be a profitable aquaculture species in Wisconsin. Purebred walleye and sauger larvae can also be raised successfully on commercial feed intensively utilizing new technologies potentially for a stocking market. Generated lots of interest in private sector – work has become one of the focus projects at NADF.

5) What do you plan to do in the future as a result of this project? Continue research development especially on early feed training and maximizing survival, need to gather economic information and a little more demonstration, working directly with private sector.

6) What information or additional resources are needed to commercially develop this enterprise? Commercial application of research with larger scale projects and funding to continue. Need to fine tune the technical aspects on a commercial scale, especially larvae culture? Potentially look into going with a full recirculation system for the fry culture as well as growout for water and cost savings. Need to expand further with commercial systems and look closely at costs for rearing and market to help new business.

7) How should the agricultural industry use the results from your grant project? Implement them on their operations and work with the facility technical staff closely to prefect the techniques.
Please complete the following survey as it applies to your grant project. Information submitted in this survey will be public record, unless it contains trade secret information that you request (in writing) to be kept confidential.

1. **NEW INVESTMENT**
   **As a result of your grant project:**
   - How much new investment have you made or plan to make into this enterprise? $20,000
   - What dollar amount of matching contributions did you make into this project? $28,000

2. **ECONOMIC RETURNS**
   **As a result of your grant project:**
   - What dollar value economic impact would you attribute to this project? $50,000
   Economic impact may be in the form of (please indicate which type):
   - increased sales
   - decreased costs
   - increased value over commodity values
   - dollar value of knowledge gained
   - dollar value of a poor investment not made
   - dollar value of the increased use of agricultural commodities

3. **AGRICULTURAL PRODUCT OR MARKET DEVELOPMENT**
   **As a result of your grant project:**
   Please list the new products or new technologies developed by this project:
   1. Hybrid walleye grown to food market size in 1 year
   2. Applied commercial technologies for raising hybrid walleye to food fish size on commercial feed
   3. Use of recycle water system for hybrid walleye and purebred walleye growout
   4. Applied research in out of season spawning technologies for walleye and sauger
   5. Rearing walleye for stocking purposes on formulated feed indoors

   Please list the new markets developed by this project:
   1. Hybrid Walleye Fillets for food market
   2. Purebred walleye fingerlings for lake stocking market
   3. Purebred walleye fingerlings for Interstate
   4. Purebred walleye fingerlings for International

   Please indicate if business activity takes place in each marketing area.
   - w/in State yes
   - Interstate yes
   - International yes

   How many new company starts have resulted from your grant project work? NA at this time

4. **NEW JOBS**
   **As a result of your grant project:**
   - How many new jobs were created since the start of your project? NA
   - How many jobs were retained since the start of your grant project? NA
5. ADDITIONAL COMMENTS (use back if necessary):

Although we do not have information on new jobs or jobs retained at this time, we have been in contact with several existing Wisconsin Aquaculture farmers who have taken this applied research and incorporated into their operations, notably Roesler Fish Farms, Northside Enterprises, Pleasant Springs Hatchery, Woods & Water Enterprises, Backwoods & Waters Fish Farm, HBR Enterprise and others. In addition, we have been cooperating and providing market size fish with several Wisconsin fish farm operations, notably Northside Enterprises, Star Prairie Trout Farm and Blue Iris Fish Farm. Many other Wisconsin fish farmers have indicated a strong interest in utilizing this new species for future work. Additionally, some new aquaculture investors have shown considerable interest in this research for some potential new operations within Wisconsin.