Clean WateR³ - Reduce, Remediate, Recycle: The genesis of a SCRI-CAP project

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ABSTRACT

In September 2014, researchers received funding for a SCRI-Coordinated Agricultural Project (CAP) entitled "Clean WateR3 - Reduce, Remediate, Recycle – Enhancing Alternative Water Resources Availability and Use to Increase Profitability in Specialty Crops." This project was initiated as a coordinated effort among a number of scientists through a multistate research group (NC1186 Water Management and Quality for Ornamental Crop Production and Health) and resulted in a 2011 SCRI planning grant titled "Containment, Remediation, and Recycling of Irrigation Water for Sustainable Ornamental Crop Production". Planning grant dollars were used to bring together scientists and stakeholders, conduct a national survey, and discuss and identify water use and management strategies employed by progressive growers throughout the U.S. Furthermore, funds were used to recruit scientists from various disciplines (socioeconomics, engineering, horticultural systems, plant pathology, environmental toxicology, and Extension), bring together a trans-disciplinary, multi-institutional research team, and over 18-months prioritize research areas of concern, refine project goals, and develop project objectives. Grant preparation was an iterative process that entailed two writing workshops for the team as a whole and a final core-writing group workshop prior to proposal submission. Overarching project goals encourage recycling and reuse of remediated irrigation runoff via developing an online decision support model available for grower use, and to research and select runoff treatment (remediation) technologies (TTs) suited for implementation at the individual site level. The Clean WateR3 team has already held its first project and Advisory Board meeting, where research on project objectives - including barriers to adoption - were refined and initiated. Outcomes of this project will help growers treat and reuse operational water to save valuable water resources, and reduce the environmental impact of runoff water.

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CLEAN WATER³
REDUCE·REMEDIATE·RECYCLE
CLEANWATER3.ORG

NC 1186 - USDA Multi-state Research Group

"Water Management and Quality for Ornamental Crop Production and Health"

- Founded to integrate national expertise using a multi-disciplinary approach to water management
- Output of 2nd meeting (at 2010 *National Water Conference*) - develop a planning grant
- NC1186 members volunteered to collaborate on the grant, White to lead
- White developed and submitted planning grant 2011 SCRI RFP
- Funding notification August 2011

SCRI Planning Project- 'Contain' 2011 - 2012

"Containment, Remediation, and Recycling of Irrigation Water for Sustainable Ornamental Crop Production"

The SURVEY

To gain a better understanding of industry-wide runoff handling, irrigation, and fertilization practices across the country.

Survey released: Jan. 2011-Nov. 2012

Respondents (388, multiple answers possible):
Greenhouses - 63.2%
Container nurseries (Pot-In-Pot) - 54.6%
Field nurseries - 38.8%

The ROUND-TABLE Discussions

To gain a better understanding of industry-wide perspectives on the future of water and water-handling, focusing on alternative water resources for the future.

Round-table Discussions with Growers:

January 2012 - MANTS (9), GSHE (11)
June 2012 - California Grown Show (14)
July 2012 - OFA (19)
August 2012 - Far West Show (8)

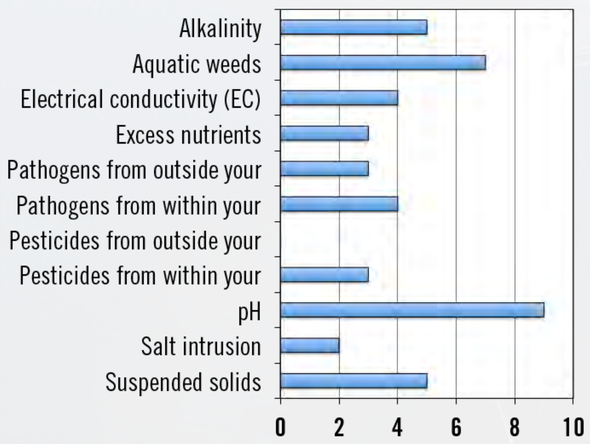

Figure 1. Frequency analysis of grower concerns related to water quality in recycling (containment) ponds.

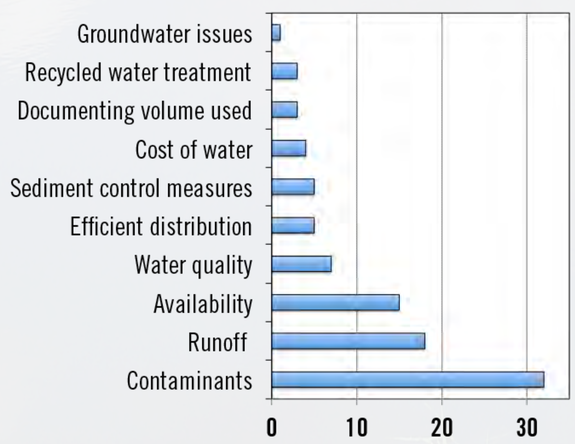

Figure 2. Frequency analysis of grower perceptions of primary production challenges related to water management.

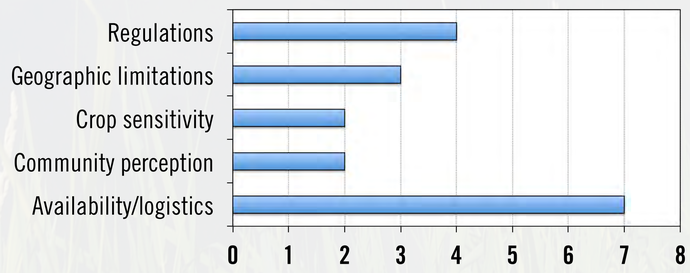

Figure 3. Frequency analysis of grower perceptions of factors that limit use of alternative water sources for irrigation.

SCRI Coordinated Agricultural Project - 'Clean WateR³' 2014-2019

*"Clean WateR³ - **R**educe, **R**emediate, **R**ecycle - Enhancing Alternative Water Resources Availability and Use to Increase Profitability in Specialty Crops"*

Project Goal:
Encourage recycling and reuse of remediated irrigation runoff

- Develop online grower decision support tools
  - Integrate socioeconomic & biological data to enhance decision making resources
- Research and select runoff treatment technologies to manage contaminants

Figure 4. Bridging the gap between research performe by the SCRI MINDS and SCRI Pathogen research teams. Evaluating runoff and contaminant control when water leaves the pot, to the point it enters a pond and may be reused.

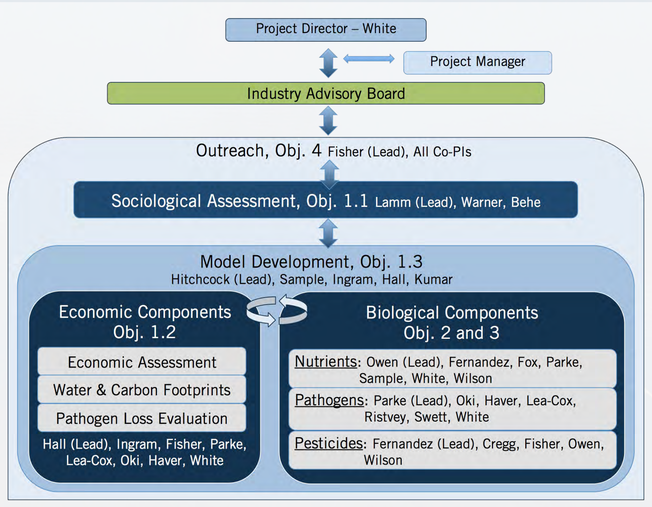

Figure 5. Clean WateR³ project goals grounded in developing informational tools for outreach; socioeconomic and biological research feed into the decision support system for growers.

Figure 6. Water conveyance structures and Clean WateR³ team monitoring and evaluation of site challenges.

Figure 7. Reducing nutrient, pesticide, and pathogen loads leaving production areas can enhance efficacy of remediation technologies and ultimately use of recycle water by growers. We will use these information to develop a model "decision support tool" to help guide grower decision making.

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