



***A Web-Based Knowledge Center  
for Water and Nutrient Management  
for the Nursery and Greenhouse Industry***

***John Lea-Cox, David Ross, Cindy Zhao and Andrew Ristvey  
University of Maryland (Lead Institution)***

***Roger Harris, Susan Day and Chuan Hong  
Virginia Polytechnic and State University***

***Ted Bilderback, Mary Lorscheider  
North Carolina State University***

***Tom Yeager, Richard Beeson  
University of Florida***

***Bill Bauerle  
Clemson University***

***John Ruter  
University of Georgia***









# Linking With National and Regional Water Quality Goals

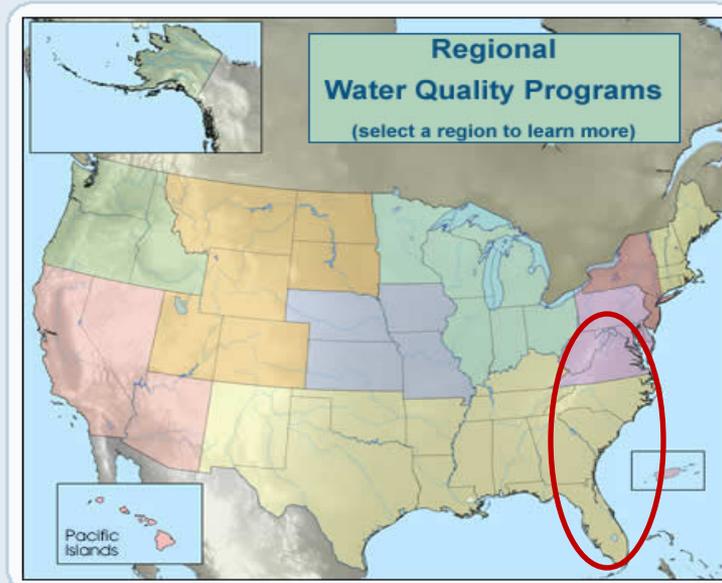
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Applying knowledge to improve water quality



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## News & Highlights ([more...](#))

FY2008 CSREES National Integrated Water Quality Program [Request for Applications](#) is available. **Deadline: April 29th**

[NRCS-CSREES awards two Synthesis project grants](#) to assess the 13 Watershed studies funded in the [Conservation Effects Assessment Project](#). Learn more in their [CRIS records](#).

National Research Council's report on the Water Implications of Biofuels Production was released in Oct. View the [report in brief](#) (pdf).

## Upcoming Events ([more...](#))

February 3-7: Sparks, NV  
[CSREES National Water Conference](#)

February 10-13: Reno, NV  
[AWWA: Sustainable Water Sources](#)

February 15: LPELC webcast  
[Ethanol co-products and their effects on manure management](#)

February 27-28: Auburn, AL  
[Vegetation for stream restoration workshop](#)



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# Linking With National and Regional Water Quality Goals

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## *Project Development Teams*

***John Lea-Cox, David Ross, Cindy Zhao and Andrew Ristvey***  
***University of Maryland (Lead Institution)***

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# Objectives of the Project

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- Regulatory and environmental issues need to be addressed
- Information on Best Management Practices is scattered
- For growers, up-to-date information is hard to access and learning opportunities are infrequent.
- There is an accumulated wisdom (grey literature) that is not easily accessible
- We have the ability to make this accumulated knowledge available over the internet

# *Target Audiences*

## Website:

- **General Public**
- **Regulatory Agencies**
- **Legislative Aids**

## Learning Modules:

- ***County and Regional Extension Educators***
- ***Growers and Industry Professionals***
- ***Industry Professionals (Consultants, Service Providers)***
- ***Undergraduate Students***
- ***NRCS Planners and other Regulatory Officers***
- ***International Audiences***



# The Website Gateway to the Knowledge Center



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**Green Industry Knowledge Center for Water and Nutrient Management**  
 Helping growers to conserve resources and improve profitability



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- Our Project
- Industry facts & Figures
- Regulatory Information
- Best Management Practices (BMP's)
- Our Research
- Knowledge Center
- Module Guided Tour
- Our Library
- Accreditation & Certification
- Frequently Asked Questions



You are here: [Home](#)>

## Welcome!

### Our Mission:

To help nursery and greenhouse growers and allied industries stay informed, improve production practices, protect the environment and maintain profitability.



Our Approach



Our Partners



Our Project



Our Contributors

Substrate Management	Irrigation Management	Management Tools	Surface Water Management	Nutrient Management	Crop Health Management
* Basic Overview of Substrate - Soil Substrates	* Selection of Water Source	* Irrigation System Audit	* Basics of Minimizing Water and Nutrient Runoff	* Basics of Fertilization	Fundamentals of plant Disease and Diagnosis
Substrate Materials & Ecology	Basic Hydraulic Irrigation Management	Plant Water Use and Modeling	Site Assessment Layout and Infrastructure	Fertilization Strategies	Disease Prevention and Control
Physical Properties of Substrates	Irrigation System Design and Components	Irrigation Scheduling Tools and Technology	Water Conveyance and Uniform Control	Nutrient Use and Efficiency	Management of Pathogens in Irrigation Water
Chemical Properties of Substrates	Best Management Practices: Overhead Irrigation	Container Basin Design	Capture and Recycling of Irrigation Water	Water & Nutrient Management Planning	
Biological Properties of Substrates	Best Management Practices: Micro Irrigation	Comprehensive Farm Planning			
Substrate Nutrient Cycling Composting & Recycling					

Knowledge Center

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# The Learning Module Homepage

http://waternut.org/moodle/

Google



**Knowledge Center Learning Modules**  
Helping growers to conserve resources and improve profitability

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English (en\_us)

## Main menu

- New User Tips
- Student Guide
- Developer Guide
- Site news
- FAQs
- Library
- Main Glossary

## Login

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## Course categories

- Substrates
- Irrigation
- Management Tools
- Surface Water
- Nutrients
- Crop Health

[Search courses ...](#)  
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## Online Users

(last 5 minutes)

Donna Pahl

## Welcome to the Knowledge Center Learning Modules!

This is the Knowledge Center Homepage for the Nursery and Greenhouse Industry. From here, you can access individual learning modules that cover a broad range of substrate, irrigation, surface water, nutrient and plant health management issues, with a focus on developing and implementing best management practices for nursery and greenhouse operations.

The objective of each module is to give participants an in-depth knowledge of that specific topic, to improve resource efficiency, productivity and the profitability in the most sustainable way.

To access individual modules, you can:

1. Click on the links in graphic chart below;
2. Read the outlines and access individual modules, by using the course categories menu on the left.

Substrate Management	Irrigation Management	Management Tools	Surface Water Management	Nutrient Management	Crop Health Management
<i>* Basic Overview of Substrates - 'Ideal Substrates'</i>	<i>* Selection of Water Source: Understanding Water Quality/Quantity</i>	<i>* Irrigation System Audits</i>	<i>* Basics of Minimizing Water and Nutrient Runoff</i>	<i>* Basics of Fertilization</i>	<i>* Fundamentals of plant Disease and Diagnosis</i>
<i>Substrate Materials &amp; Ecology</i>	<i>Basic Hydraulics: Irrigation Management</i>	<i>Plant Water Use and Modeling</i>	Site Assessment: Layout and Infrastructure	<i>Fertilization Strategies</i>	<i>Disease Prevention and Control</i>
<i>Physical Properties of Substrates</i>	<i>Irrigation System Design and Components</i>	Irrigation Scheduling Tools and Technology	Water Conveyance and Sediment Control	<i>Nutrient Use and Efficiency</i>	<i>Management of Pathogens in Irrigation Water</i>
<i>Chemical Properties of Substrates</i>	<i>Best Management Practices: Overhead Irrigation</i>	<i>Containment Basin Design</i>	<i>Capture and Recycling of Irrigation Water</i>	<i>Water &amp; Nutrient Management Planning</i>	
<i>Biological Properties of Substrates</i>	<i>Best Management Practices: Micro Irrigation</i>	Comprehensive Farm Planning			

## Latest news

12:44 PM, Aug 22

John Lea-Cox

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[Older topics ...](#)

# Simple Layout Using Moodle

http://www.watnut.org/moodle/course/view.php?id=3

## Basics of Fertilization

You are logged in as John Lea-Cox (Logout)

Home > Nutrient Basics

### Useful Links

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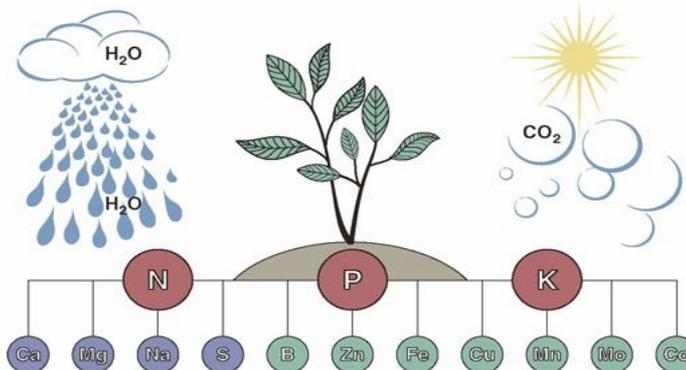
### My courses

### Topic outline



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### Welcome to the Basics of Fertilization Module!



- [Instructor Information](#)
  - [How to Cite Information from this Module](#)
  - [Goals and Objectives for this Module](#)
  - [Text Resources](#)
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### 1 Factors That Affect Plant Growth -- The 'Big Picture'

- [1. Introductory Topic Objectives](#)
  - [1.1 Light](#)
  - [1.2 Temperature](#)
  - [1.3 Plant Water](#)
    - [1.3.1 The Global Water Situation](#)
  - [1.4 Essential Nu](#)
  - [1.5 ACTIVITY: Ac](#)
  - [1.6 Watershed Ir](#)
    - [1.6.1 ACTIVI](#)

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### Messages

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### Calendar

February 2008

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4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29		

Global events  Course events  
 Group events  User events

### User Guides

# ... with Intuitive Navigation aids

## Fertilization Strategies

Home » Strategies » Resources » 3.2 Slow-Release Fertilizers

Here we discuss the specific factors that you need to consider, to determine the rate to apply slow-release ferti

Plant	N in shoots (%)	Shoot mass (g)	Total N in shoots (mg)	Total N in plant (mg)*	Growing period (weeks)	N used (mg/week)
<i>Petunia</i>	3.2	9	289	343	6	57
<i>Philadelphus mexicanus</i> , 21 weeks	3.0	22	660	792	15	53
<i>P. mexicanus</i> , 6 weeks	4.3	4.5	194	221	6	37
Pansy	4.1	4	164	188	10	19
<i>Cuphea hyssopifolia</i>	2.8	8	224	272	18	15
<i>Eucalyptus obliqua</i>	3.4	1.5	50	59	16	3.6

\* Calculated from the shoot data by assuming that root mass was 0.4 of shoot mass and roots contained 1.5% N.

You want to grow a le  
growing relatively quick  
for sale in 16 weeks.  
demand for N to that  
Response of Response  
mg/week).

**Tip:** Remember that  
= parts per million (ppm)  
in metric units is much easier than using imperial  
measures, since everything is in factors of ten. Also  
percentages are in effect decimal units, (i.e. a 2% N  
solution = 20 mg N / liter).

Navigation menu with options: < Back, Jump to..., 2.5 Self Assessment Quiz Your Knowledge!, Application Strategies, 3. Topic Objectives, 3.1 Conventional Fertilizers, Jump to..., 3.3 Soluble Fertilizers, 3.4 Pre-Plant Applications, 3.4.1 Calcium and Magnesium, 3.4.2 Phosphorus, Sulfur and Micronutrients, 3.5 Post-Plant Applications, 3.5.1 Formulating Criteria, Review your Fertilization Strategy, Best Management Practices, 4. Topic Objectives, 4.1 Application Rate, 4.2 Soluble Fertilization, 4.3 Pre-Incorporation and SRF's, 4.4 Amendments to Reduce Leaching, 4.5 Monitoring and Interpretation of EC, Re-review your Fertilization Strategy, Next >

### Example Calculation:

A fertilizer containing 15% N, with a nominal release time of 8-9 months (about 35 weeks) is to be pre-incorporated in the substrate. The temperature conditions are such that it is likely to release totally in about 25 weeks. The container holds 1.4 liters (approximately 1/3 gallon) of mix.

So, the total N required by the plant is 53 mg x 16 weeks = 848 mg N.

To incorporate the fertilizer at 1 g/L (1 kg/m<sup>3</sup>), you will need 1.4 (g/L) x 0.15 (%N) x 1000 = 210 mg N/pot.

The total released in 16 weeks is 210 x 16/25 = 134 mg N.

Therefore, we need 848/134 = 6.3 g fertilizer per pot, to satisfy plant requirements.

This works out to be (1000/1.4 x 6.3) = 4.5 kg / m<sup>3</sup> (i.e. 1000 liters = 1 m<sup>3</sup> divided by 1.4 liters [the pot volume] divided by 1000 [grams to kilograms conversion]).

However, some N will be used by microbes in the substrate and we also need to take into account the amount of N that will be lost through leaching.

So if we assume a modest 30% loss to these two factors, we arrive at a total requirement of 1.3 x 4.5 = 5.85 kg / m<sup>3</sup> (approximately 12.5 lbs / yd<sup>3</sup>).

# Providing Specific Knowledge in Targeted Areas...

## Nutrient Use and Efficiency

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Home » Nutrient Use » Resources » 2.5 Phosphorus Requirements

Plant phosphorus requirements are often much lower than the P rates which are typically applied.

*Section 2.2.1 provides a summary of the results of this paper, and more environmental implications for phosphorus runoff from nursery systems.*

Meantime, let's talk about a simple nutrient scenario with a specific crop. This data is from Ku and Hershey (1991), which was provided some fairly revolutionary data at that time.

Since it is so widely grown (and heavily fertilized), Ku and Hershey looked at Poinsettia as a model greenhouse crop. From the [partitioning data](#) shown in the figure, you will see that a mature Poinsettia contains about 0.75 gram of N and 0.1 gram P.

This is not very much when you consider how much N and P we apply over the production cycle. We will run through some calculations in the following topics (4 and 5) with this data, to illustrate how rate and the volume of water you apply are vital the efficiency of your nutrient application.

What is equally interesting from Ku and Hershey's data is that the leaves (and bracts) contain over 60% of the N and P in the plant. We'll take a look at some woody perennial data with one of the case-studies, and compare the percentages to what we see here.

So the challenge is of course to get as much of the fertilizer into the plant without it leaching out of the rootzone. As you will see later in this module, you have a surprising amount of control over the efficiency of this process.

PoinsettiaPartitioning.jpg (JPEG Image, 540x360 pixels) - ...

Ku and Hershey, 1997 - JASBS

	DM	Concentration		Content	
		mg L <sup>-1</sup> N	mg L <sup>-1</sup> P	mg N	mg P
Leaves	6	38	4	228	24
Bracts	9	30	4	270	36
Stem	5	20	3	100	15
Roots	6	30	4	180	24
Total	26			778	99

Ku and Hershey, 1997 - JASBS

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# ...Building on our Accumulated Knowledge

http://www.waturnut.org/moodle/mod/resource/view.php?id=320&subdir=/Main\_Library/Irrigation

## Library

Jump to... [Next >](#)

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This is where you will find copies of many of the reference materials that we used in the construction of this Knowledge Center. Obviously we can only give you a summary of these results in the various modules, but if you wish you can consult the original articles from here, for additional details.

Name	Size
 Argo_et_al_1997_Geographical_characterization_of_greenhouse_irrigation_water_HortTechnology_7_49-55.pdf	4.3MB
 Beeson 2005 Modeling irrigation requirements for landscape ornamentals HortTechnology 15_18-22.pdf	188.6KB
 Beeson and Yeager 2003 Plant canopy affects sprinkler irrigation application efficiency of container grown ornamentals HortScience 38_1373-1377.pdf	636.6KB
 Beeson_2006_Relationship_plant_growth_irrigation_frequency_management_allowed_edificts_container_nursery_stock_JASHS_131_140-148.pdf	8.5MB
 Biernbaum and Verluys 1998 Water Management HortTechnology 8_504-509.pdf	2.7MB
 Bilderback 2002 Water management is key in reducing nutrient runoff from container nurseries HortTechnology 12_541-544.pdf	137.6KB
 Bilderback et al 2005 Healthy substrates need physicals too HortTechnology 15_747-751.pdf	261.6KB
 Borch et al 2003 Improved Drought Tolerance in Marigold by Manipulation of Root Growth with P Nutrition HortScience 38_2.pdf	453.9KB
 Bowden_et_al_2005_Irrigation_scheduling_and_overview_of_the_potential_to_integrate_modeling_and_sensing_techniques_SNA_50_577-579.pdf	383.2KB
 Burnett et al 2005 Controlled drought affects morphology and anatomy of salvia JASHS 130_775-781.pdf	1.1MB
 Fare et al 1994 Cyclic irrigation reduces container leachate nitrate nitrogen concentration HortScience 29_1514-1517.pdf	49.7KB
 Heiskanen 1995 Water Status of Sphagnum Peat and a Peat-Perlite Mixture in Containers Subjected to Irrigation Regimes.pdf	43.3KB
 Irmak and Haman 2001 Performance of Watermark sensor in sandy soils Appl. Eng. Agr. 17_787-795.pdf	205KB
 Mathers et al 2005 Improving irrigation water use in container nurseries HortTechnology 15_8-12.pdf	112KB
 Morvant et al 1998 Irrigation Fequency affect Poinsettia Growth Water Use and Runoff HortScience 33_1.pdf	811.7KB
 Nogueira et al 2005 Effect of three irrigation systems on runoff water quality in container plant production ASAE 05-4059.pdf	441.6KB
 Norrie et al 1994 Improvements in automatic irrigation systems of peat-grown greenhouse tomatoes HortTechnology 4_154-159.pdf	291.5KB
 Schuch and Burger 1997 Water Use and Crop Coefficients of Woody Ornamentals in Containers JASHS 122_727-734.pdf	1.5MB
 Shacklet et al 1997 Plant Water Status as an Index of Irrigation Need in Decidous Fruit Trees HortTechnology 7_1.pdf	4MB
 Van Iersel et al, 2005 Using substrate water content to control irrigation of containerized maples and elms SNA 50_584-588.pdf	823.3KB
 Warren and Bilderback 2005 More plant per gallon _ Getting more out your water HortTechnology 15_14-18.pdf	98KB
 Williams and Araujo 2002 Correlations among leaf stem water potential with soil water status in Vitis vinifera JASHS 127_448-454.pdf	105.7KB
 Yeager 2005 Development of Fertilization and Irrigation Regulation in Florida HortTechnology 15_1.pdf	78.8KB

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# .. to Reduce Impacts on the Environment

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## Nutrient Use and Efficiency

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Home » Nutrient Use » Resources » 5.1.1 Develop a Strategic Nutrient Plan

This provides a guideline to develop a strategic nutrient plan for your nursery or greenhouse operation.

### 5.1.1 Develop a Strategic Nutrient Plan

You should take the time to develop a strategic nutrient management plan for your operation, as regards nutrient use. There is little doubt that you will save yourself a considerable amount of money and help reduce potential nutrient runoff issues if you consider the following steps:

#### ASSIGNMENT:

- Develop a specific fertilization application plan for three indicator species (your choice of species) for your operation -- a low, moderate and high nutrient user. It will be useful if these species constitute a relatively large percentage of the plants you grow
- Call up your fertilizer representative and ask for information on specific sources and custom-blends that will reduce your N:P ratios (target fertilizer blends with a 5 Nitrogen : 1 Phosphate: 5 Potash ratio, if at all possible).
- List all the factors that you need to consider for your specific operation, to ensure that nutrient applications (microclimate, labor availability, equipment needs etc.) will maximize nutrient uptake efficiency.
- Choose the method by which you intend to fertilize (conventional, SRF or soluble sources), and calculate the total N, P and K required for each species, using the methods outlined in this module.
- List the best nutrient management practices that you currently practice. Do you REALLY practice them?
- When did you last take a few hours to train your personnel who apply nutrients in your operation?
- Calibrate ALL application equipment -- there is no excuse for not doing this regularly!
- List all the additional nutrient management BMP's that you could easily implement. Determine the utility and cost-effectiveness of these practices by applying them on a small scale (e.g. lower N and P rates on test plots of your three indicator species).
- Consider the cost of NOT implementing these practices.

# Current Users

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- Approximately 110 active users to date (since Feb 2007)
  - 15 Developers
  - 45 Beta-testers (growers, extension agents, consultants, industry professionals and agency personnel)
  - 10 undergraduate students
- Additional self –enrolled users:
  - 31 users (national)
  - 9 International (UK, Italy, Germany, Thailand, Costa Rica, Australia and St. Vincent and Grenadines)

# Our Community of Learners

Home: Administration: Users: Accounts: Browse list of users - Mozilla Firefox

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http://www.watnut.org/moodle/admin/user.php?sort=lastaccess&dir=DESC&search=&firstinitial=&lastinitial=

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    - Upload users
    - User profile fields
  - Permissions
- Courses
- Location
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First name : All A B C D E F G H I J K L M N O P Q R S T U V W X Y Z  
Surname : All A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

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First name / Surname	Email address	City/town	Country	Last access ↓		
John Lea-Cox	jlc@umd.edu	College Park	United States of America	28 secs	Edit	
John Lea-Cox	jleacox@gmail.com	College Park	United States of America	16 mins 12 secs	Edit	Delete
Laura Templeton-Brandt	ltemple@umd.edu	College Park	United States of America	16 hours 3 mins	Edit	Delete
Andrew Ristvey	aristvey@umd.edu	Queenstown	United States of America	19 hours 12 mins	Edit	Delete
Cindy Zhao	cindzhao@umd.edu	College Park	United States of America	22 hours 32 mins		Delete
Sarah Dickinson	dickinso@gmail.com	Blacksburg	United States of America	22 hours 43 mins	Edit	Delete
matt taylor	mtaylo@gmail.com	raleigh	United States of America	1 day 12 hours	Edit	Delete
Yungchung Chen	ychen347@umd.edu	College Park	United States of America	1 day 14 hours	Edit	Delete
John Miller	johnhmillerv@verizon.net	Hydes	United States of America	1 day 23 hours	Edit	Delete
Tashawn Graham	top@umd.edu	College Park	United States of America	2 days 7 hours	Edit	Delete
Richard Beeson	rcbeeson@ufl.edu	Orlando	United States of America	2 days 18 hours	Edit	Delete
James Schillinger	jdschill@umd.edu	College Park	United States of America	2 days 19 hours	Edit	Delete
Benjamin Butler	bbutler1@umd.edu	College Park	United States of America	2 days 20 hours	Edit	Delete
Ryan Janoch	rjanoch@umd.edu	College Park	United States of America	2 days 20 hours	Edit	Delete
Mary Lorscheider	Mary_Lorscheider@ncsu.edu	Raleigh, NC	United States of America	2 days 21 hours	Edit	Delete
Stephanie Wyman	swyman@eqri.com	Baltimore	United States of America	3 days 1 hour	Edit	Delete
Susan Day	sdd@vt.edu	Blacksburg, VA	United States of America	3 days 12 hours	Edit	Delete
ronald pegg	rpegg@wildblue.net	mechanicsville	United States of America	4 days 13 hours	Edit	Delete
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Roger Harris	rharris@vt.edu	Blacksburg	United States of America	9 days 20 hours	Edit	Delete
Jane Bishop	dickandjanestfarm@verizon.net	Harwood	United States of America	9 days 23 hours	Edit	Delete
Sallee Hearne	wingedhorse@verizon.net	Millington	United States of America	10 days 18 hours	Edit	Delete
Tom Banko	tbanko@vt.edu	Virginia Beach	United States of America	10 days 23 hours	Edit	Delete
Flo Chaffin	flososr@earthlink.net	Watkinsville	United States of America	11 days 21 hours	Edit	Delete
Shawn Sizer	shawnsizer@hashconstruction.com	La Plata	United States of America	11 days 22 hours	Edit	Delete

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**Knowledge Center Learning Modules**  
Helping growers to conserve resources and improve profitability

Home > margaret beattie > Activity report > All logs

**margaret beattie**

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Outline report Complete report Today's logs All logs Grade

### Hits on Home by margaret beattie

Date	Hits
Wed 5 Sep	0
Wed 12 Sep	0
Wed 19 Sep	0
Wed 26 Sep	0
Wed 3 Oct	0
Wed 10 Oct	0
Wed 17 Oct	0
Wed 24 Oct	0
Wed 31 Oct	0
Tue 6 Nov	0
Tue 13 Nov	0
Tue 20 Nov	0
Tue 27 Nov	0
Tue 4 Dec	0
Tue 11 Dec	0
Tue 18 Dec	0
Tue 25 Dec	0
Tue 1 Jan	9
Tue 8 Jan	0
Tue 15 Jan	15
Tue 22 Jan	7
Tue 29 Jan	0

Displaying 31 records

Course	Time	IP Address	Full name	Action	Information
Library	Sun 27 January 2008, 06:08 PM	88.107.4.206	margaret beattie	glossary view	Main Glossary
Library	Sun 27 January 2008, 06:08 PM	88.107.4.206	margaret beattie	glossary view	Main Glossary
Library	Sun 27 January 2008, 08:08 PM	88.107.4.206	margaret beattie	glossary view	Main Glossary
Library	Sun 27 January 2008, 06:07 PM	88.107.4.206	margaret beattie	glossary view	Main Glossary
Home	Sun 27 January 2008, 06:07 PM	88.107.4.206	margaret beattie	resource view	Main Glossary
Home	Sun 27 January 2008, 06:07 PM	88.107.4.206	margaret beattie	course view	Water and Nutrient Management for the Nursery and Greenhouse Industries
Home	Sun 27 January 2008, 06:07 PM	88.107.4.206	margaret beattie	user login	275
BioI_Prop	Thu 17 January 2008, 05:45 PM	88.107.116.152	margaret beattie	quiz view	Quiz yourself on Biological Properties!
BioI_Prop	Thu 17 January 2008, 05:45 PM	88.107.116.152	margaret beattie	course recent	24
BioI_Prop	Thu 17 January 2008, 05:45 PM	88.107.116.152	margaret beattie	course view	Biological Properties of Substrates
System Design	Thu 17 January 2008, 05:45 PM	88.107.116.152	margaret beattie	course view	Irrigation System Design and Components
Basic_Overview	Thu 17 January 2008, 05:44 PM	88.107.116.152	margaret beattie	resource view all	START HERE
Basic_Overview	Thu 17 January 2008, 05:44 PM	88.107.116.152	margaret beattie	resource view	START HERE
Basic_Overview	Thu 17 January 2008, 05:43 PM	88.107.116.152	margaret beattie	course view	Basic Overview of Soils and Substrates
Your Water	Thu 17 January 2008, 05:43 PM	88.107.116.152	margaret beattie	resource view	3.3 Light
Your Water	Thu 17 January 2008, 05:42 PM	88.107.116.152	margaret beattie	course view	Understanding Water Source
Home	Thu 17 January 2008, 05:42 PM	88.107.116.152	margaret beattie	forum view forum	FAQs
Home	Thu 17 January 2008, 05:41 PM	88.107.116.152	margaret beattie	forum view forum	Site news
Home	Thu 17 January 2008, 05:41 PM	88.107.116.152	margaret beattie	resource view	Library
Home	Thu 17 January 2008, 05:41 PM	88.107.116.152	margaret beattie	resource view	Main Glossary
Home	Thu 17 January 2008, 05:41 PM	88.107.116.152	margaret beattie	course view	Water and Nutrient Management for the Nursery and Greenhouse Industries
Home	Thu 17 January 2008, 05:41 PM	88.107.116.152	margaret beattie	user login	275
Home	Fri 4 January 2008, 07:00 PM	88.107.86.231	margaret beattie	resource view	Main Glossary
Home	Fri 4 January 2008, 07:00 PM	88.107.86.231	margaret beattie	resource view	Library

# Tracking for Certification Purposes

Home: Activity report (alllogs) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.watnut.org/moodle/course/user.php?id=1&user=296&mode=alllogs

Google

## matt taylor

[Profile](#) [Edit profile](#) [Forum posts](#) [Blog](#) [Activity reports](#) [Roles](#)  
[Outline report](#) [Complete report](#) [Today's logs](#) [All logs](#) [Grade](#)

### Hits on Home by matt taylor

Displaying 49 records

Course	Time	IP Address	Full name	Action	Information
Strategies	Thu 31 January 2008, 08:33 PM	69.134.186.179	matt taylor	resource view	4.5 Monitoring and Interpretation of EC
Strategies	Thu 31 January 2008, 08:33 PM	69.134.186.179	matt taylor	course view	Fertilization Strategies
Nutrient Basics	Thu 31 January 2008, 08:33 PM	69.134.186.179	matt taylor	course view	Basics of Fertilization
Home	Thu 31 January 2008, 08:33 PM	69.134.186.179	matt taylor	course view	Water and Nutrient Management for the Nursery and Greenhouse Industries
Nutrient Basics	Thu 31 January 2008, 08:30 PM	69.134.186.179	matt taylor	resource view	3.4 Anion Exchange Capacity
Nutrient Basics	Thu 31 January 2008, 08:29 PM	69.134.186.179	matt taylor	resource view	3.7 Electrical Conductivity
Nutrient Basics	Thu 31 January 2008, 08:25 PM	69.134.186.179	matt taylor	course view	Basics of Fertilization
Home	Thu 31 January 2008, 08:25 PM	69.134.186.179	matt taylor	user login	296
Home	Wed 23 January 2008, 04:53 PM	69.134.186.179	matt taylor	course view	Water and Nutrient Management for the Nursery and Greenhouse Industries
Home	Wed 23 January 2008, 04:49 PM	69.134.186.179	matt taylor	user view	matt taylor
Home	Wed 23 January 2008, 04:48 PM	69.134.186.179	matt taylor	course view	Water and Nutrient Management for the Nursery and Greenhouse Industries
Strategies	Wed 23 January 2008, 04:48 PM	69.134.186.179	matt taylor	course view	Fertilization Strategies
Strategies	Wed 23 January 2008, 03:37 PM	69.134.186.179	matt taylor	assignment view	Re-review your Fertilization Strategy
Strategies	Wed 23 January 2008, 03:34 PM	69.134.186.179	matt taylor	resource view	4.5 Monitoring and Interpretation of EC
Strategies	Wed 23 January 2008, 03:34 PM	69.134.186.179	matt taylor	resource view	4.4 Amendments to Reduce Leaching
Strategies	Wed 23 January 2008, 03:33 PM	69.134.186.179	matt taylor	resource view	4.3 Pre-Incorporation and SRF's
Strategies	Wed 23 January 2008, 03:31 PM	69.134.186.179	matt taylor	resource view	4.2 Soluble Fertilization
Strategies	Wed 23 January 2008, 03:31 PM	69.134.186.179	matt taylor	resource view	4.1 Application Rate
Strategies	Wed 23 January 2008, 03:27 PM	69.134.186.179	matt taylor	resource view	4. Topic Objectives
Strategies	Wed 23 January 2008, 03:26 PM	69.134.186.179	matt taylor	course view	Fertilization Strategies
Strategies	Wed 23 January 2008, 03:20 PM	69.134.186.179	matt taylor	resource view	3.5 Post-Plant Applications
Strategies	Wed 23 January 2008, 03:19 PM	69.134.186.179	matt taylor	course view	Fertilization Strategies
Strategies	Wed 23 January 2008, 03:10 PM	69.134.186.179	matt taylor	resource view	3.4 Pre-Plant Applications
Strategies	Wed 23 January 2008, 02:55 PM	69.134.186.179	matt taylor	resource view	3. Topic Objectives
Strategies	Wed 23 January 2008, 02:48 PM	69.134.186.179	matt taylor	resource view	2.4 Soluble Sources

# Impacts

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- We have developed an effective mechanism, to inform and encourage the adoption of best management practices
- We have an active community of practice
- We are creating a community of interest, with a worldwide user base
- We are using this resource to identify and fill gaps in our knowledge

# Challenges for 2008

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- We need to actively promote the site  
(Goal = 300 active users by Jan 2009)
- We will complete 4 outstanding modules; Add 2 new modules
- We will actively survey users to understand how they are using the information
- We will engage regulatory bodies to give CEU credits for completed modules (e.g. MDA, CCA), to incentivize use
- We will explore the integration of this knowledge Center into eXtension

# For More Information....

The screenshot shows a web browser window with the URL [http://www.usawaterquality.org/themes/npm/success/E\\_lear](http://www.usawaterquality.org/themes/npm/success/E_lear). The page title is "Home > Themes > Npm > Success > E-Learning Resource for Nursery & Greenhouse Industry". The header features the National Water Program logo and the tagline "Applying knowledge to improve water quality". A navigation menu includes links for "About", "Regional Programs", "National Themes", "National Projects", "Watershed Projects", "Success Stories", "Proceedings", "Focus Issues", and "Online Resources".

The main content area is titled "- SUCCESS STORY -" and contains the following text:

This project is just one example within the Land Grant University System that enhanced better nutrient and pesticide management thereby improving water quality. Please check back periodically for other highlighted programs.

**E-Learning Resource for the Nursery and Greenhouse Industry**

**Situation**  
Today, ornamental crop production is among the fastest growing sectors of agriculture. The [American Nursery and Landscape Association](#) → has ranked water and nutrient management as one of their top five research priorities. Container-nursery and greenhouse systems differ radically from traditional agronomic-type agricultural operations in terms of water and nutrient use, and there is an acknowledged lack of up-to-date information in these knowledge areas.

**Actions**  
Extension Faculty from six states (in Mid-Atlantic and Southern regions) developed a [web-based educational resource center](#) → to provide research-based knowledge on water (both irrigation and surface water) management and nutrient management for the nursery and greenhouse industry. Users are directed to information resources on the greenhouse and nursery industries in the six states, including information on regulations, best management practices (BMPs), active research areas, accreditation and certification as well as the [gateway to the learning modules](#). → Initial beta-tests involving 50 growers, industry consultants and educators have been completed of ten learning modules. Additional development and testing of the remaining modules is planned during 2007. Users also have access to a large number of specific journal articles (as searchable PDFs) with password-secure access through Moodle.

**Impacts**  
Development of these e-learning resources for a large geographic area will:

An inset image shows a screenshot of the "The Website Gateway to the Learning Center" with a "Moodle" section highlighted.

**Website:** <http://waternut.org>

**Learning Modules:** <http://waternut.org/moodle>

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