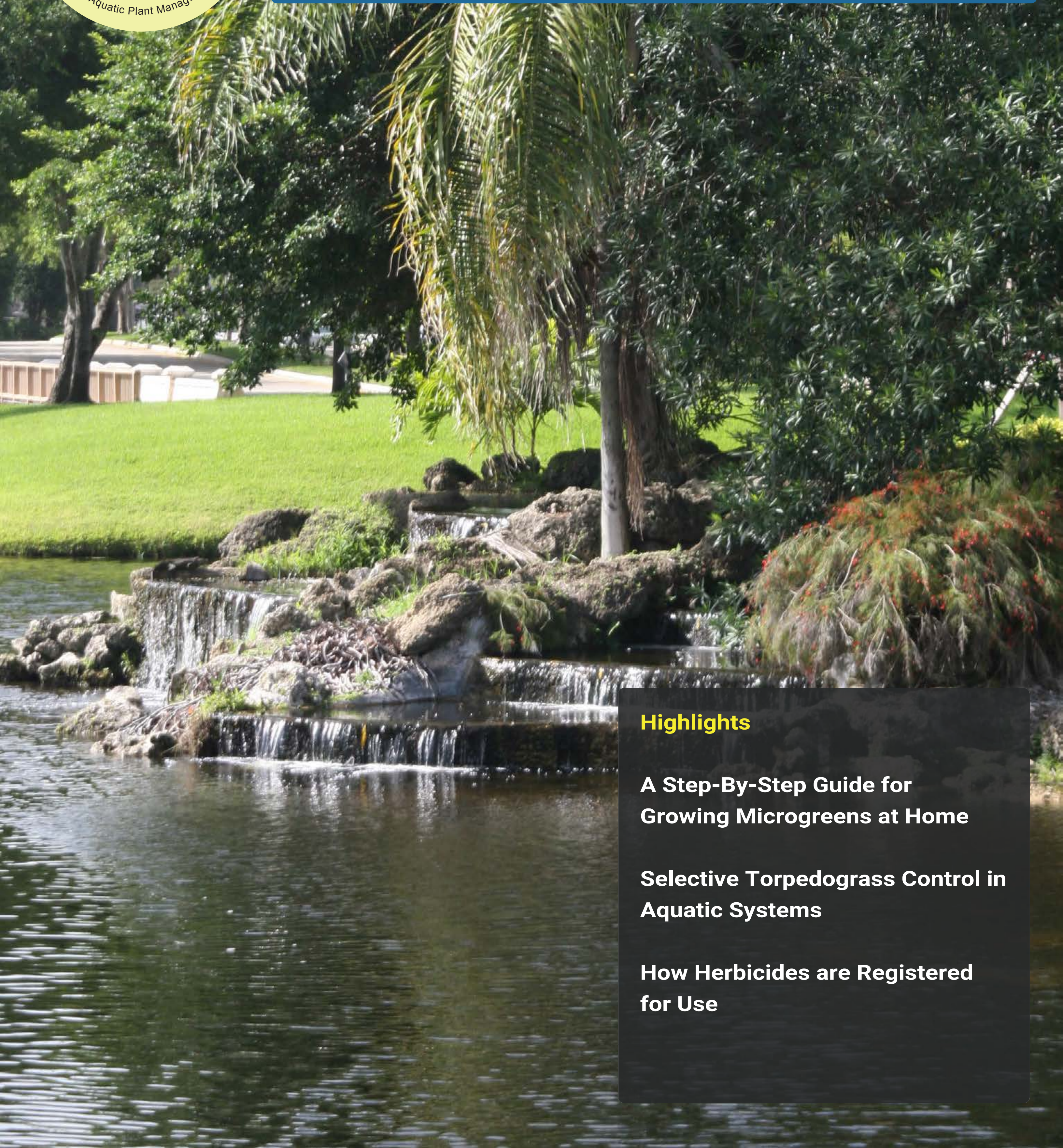
The South Florida Aquatic Plant Management Society

The Hydrophyte

Volume 28 Issue 1



Highlights

A Step-By-Step Guide for Growing Microgreens at Home

Selective Torpedograss Control in Aquatic Systems

How Herbicides are Registered for Use

President's Message

I would like to thank the Board of Directors for electing me President of the South Florida Aquatic Plant Management Society for 2024. It's a great honor and privilege to serve our organization. As an applicator this means a great deal to me, an organization that was founded by applicators for applicators. To go out every day and do a job that is both enjoyable and also a benefit for our state and environment. It gives us a great deal of pride and satisfaction knowing we are keeping South Florida beautiful and allowing to enjoy what we know as our home.

We face new challenges to our industry daily it seems. South Florida at times is like ancient Rome, The Crossroads Of The World. There are more and more new residents to Florida placing a strain on our environment, the infrastructure and our natural resources. Not to mention the invasive plants and animals that are harmful to our already delicate environment. Be diligent of these potential threats as we are also faced with new residents and some others who have no idea what it is we actually do. It's very important to address and engage the residents in a positive and educated manor, and inform them as to what we do. We are all stewards of our wonderful and diverse aquatic ecosystems. People will at times observe and unfairly judge us. I also encourage dialogue with outreach and education to the general public. A little bit goes a long way. Now is a golden opportunity to help them understand.

And on a final note, I would also encourage our members to bring in new members…new faces and new ideas.

I look forward to serving our organization this year.

Keith Andreu – President
South Florida Aquatic Plant Management Society

Cover Photo:
Allstate Resource Management

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The Francis E. "Chil" Rossbach Scholarship Fund

Funds from the scholarship are used to help defray costs for students taking classes related to the study of aquatic environmental sciences or related areas. The scholarship is open to anyone, and all are encouraged to apply. Applications will be accepted throughout the year and the scholarship awarded when a suitable candidate is found. Money raised by the Society during the year partially goes to fund this scholarship, the intent of which is to promote the study of aquatics.
For an application, please go to www.sfapms.org.

A Step-By-Step Guide for Growing Microgreens at Home

By: Francesco Di Gioia, Ph. D.
Assistant Professor of Vegetable Crop Science | PennState Extension

Due to increasing costs, going to the grocery store can be more challenging, and many people have modified their grocery shopping habits by reducing the frequency with which they go grocery shopping, which may limit the opportunity to buy the most perishable greens.

Many are investing in a home garden to grow their own fresh vegetables while re-discovering the beneficial de-stress effects of gardening. If you do not have space for a garden, believe that you do not have a "green thumb," or are discouraged by your previous gardening experiences, do not despair! Microgreens may provide you with a new opportunity.

According to the 2015-2020 Dietary Guidelines for Americans, the recommended amount of vegetables in a 2,000-calorie diet is 2½ cup-equivalents of vegetables per day. Vegetables are a rich source of many nutrients that are critical for our health, including dietary fiber, pro-vitamin A, vitamin C, vitamin K, vitamin E, vitamin B6, folate, thiamin, niacin, and choline, as well as essential minerals like potassium, iron, zinc, copper, magnesium, and manganese.

Microgreens are nutrient-dense tiny greens that may be grown in limited space, in a relatively short time, even on a windowsill or in your kitchen. Given their high nutritional value and the variety of species you can grow, microgreens can provide you with nutrient-dense greens and the de-stressing experience of working in your home garden.

Please check the ABCs of Microgreens to learn more about what microgreens are, how they are used, the species that are suitable to grow as microgreens, and where to source seeds.

What You Needed to Grow Microgreens at Home

Microgreen production for self-consumption in a household does not require using any special tool, and besides the seeds, you should be able to find everything you need at home or in any household product store (Figure 1). If you plan to grow microgreens continuously for more efficient production, buying some growing trays and small tools specifically designed to produce microgreens might be convenient.

The basic items you need are:

- Seeds
- Drinking water
- Growing medium or mat
- Growing containers or trays
- A small kitchen scale or measuring cups
- A spray bottle and a pitcher
- A sharp knife or a pair of scissors

For some species that require to be pre-soaked, you may need a few cups for soaking the seeds in water and a small colander to rinse the seeds once or twice before germination. You need a clean surface or shelf to place the growing trays depending on where you plan to grow microgreens. While the natural sunlight available behind a window, on a balcony, or a small porch is generally enough to grow microgreens, it is possible to supplement the natural sunlight with a source of artificial lighting developed explicitly for plant growth. Moreover, some species may be grown in a dark environment and do not require any light from sowing until harvest.

A key element necessary to produce microgreens is the growing medium. The most popular media used are peat-based mixes, coconut coir, and mats constituted of natural (cotton, kenaf, hemp) or synthetic fibers (rockwool). The growing medium is important because the capacity to hold soil moisture and the frequency with which water should be applied depends on its properties and many other aspects, such as the availability of nutrients and the quality of the microgreens. The suggestion is to use what is readily available and relatively non-expensive, ensuring that it is environmentally sustainable, clean, and safe.

How to Grow Microgreens

Step 1. Calculate and measure the optimal amount of seeds needed for your trays

After selecting the species of microgreens you would like to grow and purchasing microgreen seeds, calculate the amount of seeds you need for your square, rectangular, or circular planting trays following the instructions provided here or using the Microgreens Seed Density Calculator developed to make things very easy for you.

Figure 1. Example of tools and material needed to start cultivation of microgreens at home: You will need 1) microgreen seeds, 2) small cups or containers to soak the seeds in water, 3) growth trays and 4) a growing medium (in this case is a peat and perlite mix), 5) measuring cups/spoons to measure the right amount of seeds per tray, 6) a small colander, 7) a pitcher and 8) a spray bottle. Photo: Francesco Di Gioia, Penn State


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You can measure the number of seeds using a small scale that you may have in your kitchen, and once you measure the amount of seeds for a tray, you can measure the amount of seeds you need using measuring cups or spoons.

Left: Example of a scale used to measure the amount of seed for a small tray. Right: Example of teaspoon and tablespoon used to measure the amount of seed for a small tray. Photos: Francesco Di Gioia, Penn State

Step 2. Prepare your trays and growing media

Trays and or containers of different shapes and sizes may be used to plant microgreens. Since microgreens do not require a lot of medium to grow on, flat trays are generally preferred over regular nursery pots. While microgreen planting trays of different sizes may be purchased from different sources, recycling containers deriving from food packaging is also possible. The main recommendation is to make sure you are using material that is suitable for food production, that it's clean, and that the trays have drainage holes at the bottom. This will allow you to water the trays from the bottom without letting the water contact the greens, enabling the excess water to drain.

Left: Example of a tray with drainage holes at the bottom filled with a peat and perlite mix. Right: Example of 10′ × 30′ tray with and without drainage holes at the bottom. Photos: Francesco Di Gioia, Penn State

After filling or setting the trays with the growing medium, using a clean container without holes and filled with drinking water, you can slowly wet the growing medium from the bottom, and once the medium is wet enough, let the excess water drain. The moisture of the medium will help tiny seeds stick to the surface and keep the seeds moist during germination.

Left: Watering planting trays from the bottom. Right: Example of trays filled with a peat perlite mix before and after being watered from the bottom. Photos: Francesco Di Gioia, Penn State

Step 3. Seed your trays

At this point, you can start seeding by evenly distributing the defined amount of microgreen seeds on the entire growing area of each tray. Most of the microgreen seeds do not require any treatment. However, for some species characterized by larger seeds or a hard seed shell, the germination process may accelerate if seeds are pre-soaked in water. Seeds can be soaked in water overnight for 8-12 hours.

During this process, it is beneficial to rinse the seeds in running water a couple of times to wash the seeds and let them get some oxygen.

After distributing the seeds on the growing medium surface, it is not necessary, and it could be better not to cover the seeds with soil so that the sprouts remain clean. After seeding, It is enough to apply some water, occasionally using a spray bottle to keep the seed moist during germination.

It is recommended to keep the seeds in a dark environment for a few days to facilitate the germination process and keep a good moisture level during the germination.

This can be easily achieved by covering the microgreen trays with something that can block the sunlight.

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	GALLONS PER ACRE/FT	
ppm Copper	9% Copper	Symmetry NXG
0.17	0.50	0.57
0.33	1.00	1.14
0.50	1.50	1.70
0.67	2.00	2.26
0.83	2.50	2.84
1.00	3.00	3.40

Left: Seeding mustard microgreens. Right: Example of pea and sunflower seeds soaking in drinking water. Photos: Francesco Di Gioia, Penn State

Left: Seeding peas after pre-soaking in water for about 10 hours. Right: Seed sunflowers after pre-soaking them in water for about 10 hours. Photos: Francesco Di Gioia, Penn State

Use a spray bottle for misting water on the seeds after seeding. Photo: Francesco Di Gioia, Penn State

Left: Growing trays may be stacked to put some weight on larger seeds and kept in the dark. Right: Growing trays kept in the dark during the germination. Photos: Francesco Di Gioia, Penn State

For some species, like pea and sunflower, it is recommended to put some weight on the seeds during germination to keep the seeds in contact with the soil. In the case of sunflower and other species, maintaining the weight on top of the shoots during the germination process also facilitates the detachment of the seed hulls from the cotyledons.

Step 4. Microgreens growth and management

After the germination process is complete and seedlings reach a certain height, it is possible to uncover the trays and expose the sprouts to sunlight. In selecting a place to grow your microgreens, consider that, like any other plant, microgreens benefit from good exposure to sunlight; therefore, place them where you have more light.

Usually, a window on the south side of the house or apartment will receive more sunlight than one exposed north. As the microgreens start growing, if the light is limited, you will see the shoots leaning toward the light. A good level of sunlight will ensure optimal growth and a higher accumulation of antioxidants is produced by plants, primarily in response to solar radiation.

At this point, besides the light, the only thing to do is to check that the seedlings have enough water. Water should be provided only if necessary, avoiding excess moisture and allowing drainage to prevent mold development.

To limit the contact between water and the greens, it is recommended to water the trays from the bottom. Opening the window occasionally to enhance air circulation may also be beneficial to avoid excess moisture.

Left: Brassica germinated seeds kept in the dark for 3 days after seeding. Center: Brassica germinated seeds exposed to sunlight 3 days after seeding. Right: Brassica germinated seeds exposed to sunlight 4 days after seeding. Photos: Francesco Di Gioia, Penn State

Florida Strawberry and Basil Chicken

Recipe from Fresh From Florida
Florida Department of Agriculture and Consumer Services

Ingredients

2 1/4 cups fresh Florida strawberries, diced small

4 tablespoons fresh squeezed Florida orange juice

2 tablespoons white balsamic or balsamic vinegar

1 1/2 tablespoons cooking oil

1 teaspoon fresh garlic, minced

2 teaspoons all-purpose seasoning (Everglades seasoning)

4 large boneless chicken thighs or breasts, trimmed

1/2 cup red onion, diced small

1 cup fresh basil, chopped

Preparation

Make the marinade for the chicken by combining the vinegar, 1 tablespoon cooking oil, 2 tablespoons fresh squeezed orange juice, garlic, 1 teaspoon seasoning blend and 1/4 cup diced strawberries. Stir ingredients well and use mixture to marinate the chicken for a minimum of 2 hours, or preferably overnight.

Preheat a saute pan over medium heat and add 1/2 tablespoon cooking oil. Remove the chicken from the marinade, and pat dry. Carefully place the chicken in the saute pan and cook for 8 to 10 minutes (4 to 5 on each side) until the chicken is completely cooked. Remove the chicken from the pan and let cool slightly.

In a small mixing bowl, combine 2 cups Florida strawberries, red onion, 2 tablespoons fresh squeezed orange juice, 1 teaspoon seasoning blend and basil. Stir to combine. Taste the strawberry-basil mixture and adjust seasoning with the spice blend.

To serve, add the cooked chicken to a platter and top with the fresh strawberry-basil mixture. Garnish with fresh citrus, whole Florida strawberries and fresh basil leaves.

Step 5. Microgreens harvest

Depending on the species and the growing conditions, microgreens may be ready to harvest in a few days or a couple of weeks after germination is complete. Microgreens may be harvested using a clean, sharp knife or a pair of scissors right before being used for any preparation.

Washing microgreens in fresh drinking water before consuming them is always recommended. However, be aware that microgreens plant tissues are very gentle, and their shelf life may be substantially reduced after washing.

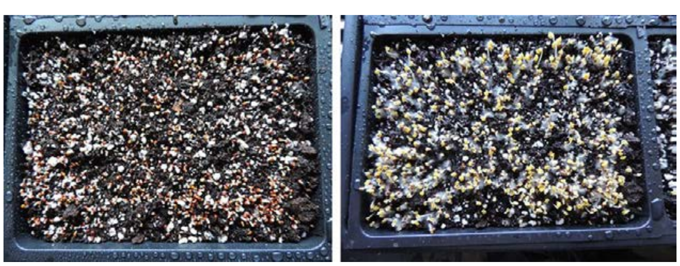
An alternative could be to bag and store microgreens at low temperatures and wash them right before they are used.

After harvesting your microgreens, if your growing medium is organic, you can compost it and wash and reuse your planting trays or containers.

Left: Harvesting microgreens. Right: Microgreens salad freshly harvested. Photos: Francesco Di Gioia, Penn State

Mustard microgreens – from seeding to harvest.

Photos: Francesco Di Gioia, Penn State



Left: Day 1. Complete germination. Right: Day 2.

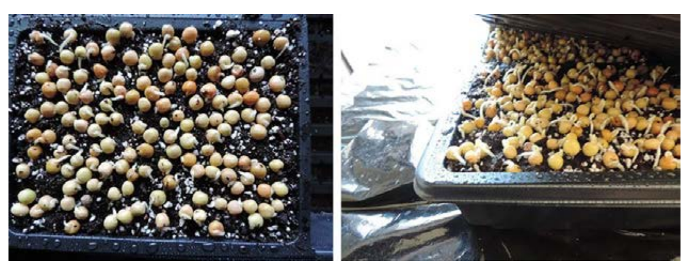
Left: Day 3. Right: Day 4.

Left: Day 5. Right: Day 6.

Left: Day 7. Right: Day 8.

Pea shoots – from seeding to harvest.

Photos: Francesco Di Gioia, Penn State



Left: Day 1. Right: Day 2.

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Left: Day 3. Right: Day 4.

Left: Day 7. Right: Day 8.

Left: Day 5. Right: Day 6.

Left: Day 9. Right: Day 9.- Harvest.

References

Di Gioia, F. and Santamaria, P., 2015. Microgreens-Novel fresh and functional food to explore all the value of biodiversity. Bari: ECO-logica srl.

Di Gioia, F., Renna, M. and Santamaria, P., 2017. Sprouts, microgreens and "baby leaf" vegetables. In Minimally Processed Refrigerated Fruits and Vegetables (pp. 403-432). Springer, Boston, MA.

RESEARCH GUIDE

Selective Torpedograss Control in Aquatic Systems

UF|IFAS UNIVERSITY of FLORIDA | CENTER FOR AQUATIC AND INVASIVE PLANTS

Enloe, S.F., Netherland, M.D., & Lauer, D.K.

Introduction

Invasive grasses are consistently problematic for aquatic and wetland managers. Torpedograss (*Panicum repens*) is especially problematic in Florida where it infests thousands of hectares of wetlands, reduces wildlife habitat quality, and creates poor sportfishing habitat as it grows into dense tangled mats.

INVASIVE GRASSES ARE ONE OF THE **MOST DIFFICULT ASPECTS OF** VEGETATION MANAGEMENT **IN MANY AQUATIC** AND WETLAND SYSTEMS.

Current Conditions

Current management strategies almost exclusively use glyphosate and imazapyr to control these invasive grasses. These herbicide solutions provide control of many aggressive grasses, however they are both nonselective and may injure or kill non target species.

This can result in a reset of treated areas and delay restoration of native habitats. Selective herbicide strategies to preserve native habitats and conserve nontarget species is a critical management goal.

Sethoxydim is a grass-active herbicide solution that has been used for control of many weedy grasses and its selectivity has been well established.

So What?

The UF/IFAS Center for Aquatic and Invasive Plants evaluated the selectivity and effectiveness of sethoxydim for aquatic torpedograss control in four field studies.

Graminicides

Chemical herbicide solutions that selectively target the cell tissues of grass leaves. Graminicdes, or "grass-active herbicides" are well established in terrestrial, or ground, systems like weed control in row crops.

There is significant potential for incorporating grass-specific herbicide into aquatic management and restoration projects. Sethoxydim is a graminicide with such potential.

Native Species Examined

To evaluate the effectiveness of selectivity on native plants, researchers tested the following 7 species:

Southern bulrush
Schoenoplectus californicus

Knotted spikerush
Eleocharis interstincta

Common cattail
Typha latifolia

Gulfcoast spikebrush
Eleocharis cellulosa

Common arrowhead
Sagittaria latifolia

Pickerelweed
Pontederia cordata

Egyptian panicgrass
Paspaldium geminatum


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Experiment

UF/IFAS CAIP researchers investigated the performance of a selective herbicide for invasive torpedograss control.

Four field studies were conducted in South Florida from 2015 to 2017. All sites were naturally infested with torpedograss and treatments varied at each site.

3 Objectives

- Evaluate sethoxydim performance on invasive torpedograss
- Determine if sequential applications improve long-term management compared to single applications
- Determine selectivity of sethoxydim against established, native plant species

Results

The lack of effect on nongrass, native plants (Figure 1) suggests that early and multiple treatments (Table 1) for invasive grasses without harming native populations is possible. However, native grass species such as Egyptian panicgrass, are sensitive to sethoxydim.

A high level of selectivity exists for sethoxydim in selective torpedograss control.

Figure 1

Percentage of biomass reduction for one nongrass, native species: pickerelweed. Each bar represents an average from three replications. Asterisks indicate a significant difference between herbicide biomass and control. Negative values indicate a positive growth response.

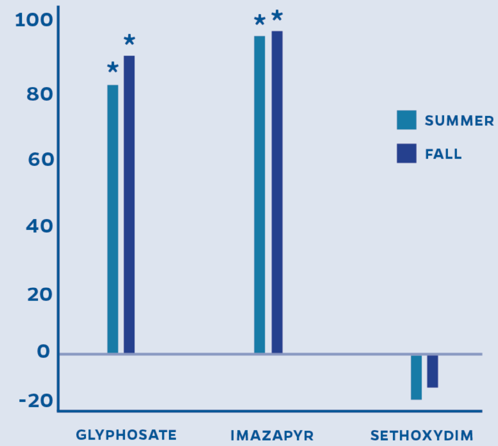

Table 1

Torpedograss control with single or sequential late spring ground-based broadcast application at Bonita Springs, FL. Sequential or repeated sequential sethoxydim applications resulted in significantly better torpedograss control than the single application at all evaluation dates, except for 30 DAIT.

HERBICIDE	NUMBER OF APPLICATIONS	% CONTROL**		
		30 DAIT*	180 DAIT	360 DAIT
GLYPHOSATE & IMAZAPYR	1	96a	98a	99a
SETHOXYDIM	1	53b	29b	30c
SETHOXYDIM	2	70ab	91a	67b
SETHOXYDIM	3	65ab	99a	70b

* DAIT = DAYS AFTER INITIAL TREATMENT

** MEAN PERCENT CONTROL WITHIN COLUMNS FOLLOWED BY THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

FOR MORE INFORMATION CONTACT US

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TURNING SCIENCE INTO SOLUTIONS

***Adapted from the following studies:**

Enloe, S.F., Netherland, M.D., & Lauer, D.K. (2018). Evaluation of sethoxydim for torpedograss control in aquatic and wetland sites. *Journal of Aquatic Plant Management, 56*, 93-100.

Enloe, S.F., Netherland, M.D. (2017). Evaluation of three grass-specific herbicides on torpedograss (Panicum repens) and seven nontarget, native aquatic plants. Journal of Aquatic Plant Management, 56, 65-70.

HOW ARE HERBICIDES REGISTERED FOR USE?

A GLIMPSE INTO THE ROBUST REGISTRATION PROCESS FOR HERBICIDES USED IN PLANT MANAGEMENT

Plant management oftentimes requires the use of herbicides in both aquatic and terrestrial systems. **Herbicides are a type of pesticide intended for preventing, destroying, repelling, or mitigating problematic or pest plants.**

Before an herbicide is able to be distributed or sold in any U.S. market, the manufactuerer must put the product through an extensive and expensive registration process that ensures it meets federal safety standards. These safety standards are regulated under two laws: **the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Federal Food, Drug, and Cosmetic Act (FFDCA)** to protect human and environmental health.

In 1947, FIFRA was enacted to regulate the registration, distribution, sale, and use of pesticides in the United States. This was originally under the U.S. Department of Agriculture (USDA).

In 1970, the U.S. Environmental Protection Agency (EPA) was formed and by 1972, FIFRA was revised to reflect the current policy. Stating that the formation of all pesticides must be registered through the EPA.

FIFRA states that a pesticide, when used according to the label specifications, will not generally cause unreasonable adverse effects on the environment.

This is defined in two ways: "(1) any unreasonable risk to man or the environment, taking into account the economic, social, environmental costs and benefits of the use of any pesticide, or (2) a human dietary risk from residues that result from a use of a pesticide in or on any food inconsistent with the standard under section 408 of the Federal Food, Drug, and Cosmetic Act (FFDCA)."

The FFDCA requires that the registration process also determines that there is reasonable certainty that no harm will result from pesticide residue found in foods.

Before the EPA registers a pesticide, it must be evaluated by a thorough series of scientific tests to demonstrate that it meets human, animal, and environmental safety standards.

Once a product is registered it is sold and distributed with a label that is a legally binding document.

It is important for land managers and aquatic applicators to safely and legally handle pesticide products based on the directions and precautions on the label. These safety standards and handeling procedures on the label are an essential part of the registration process.

The Label is the Law

All pesticide labels state:
"It is a violation of Federal law to use this product in a manner inconsistent with its labeling."

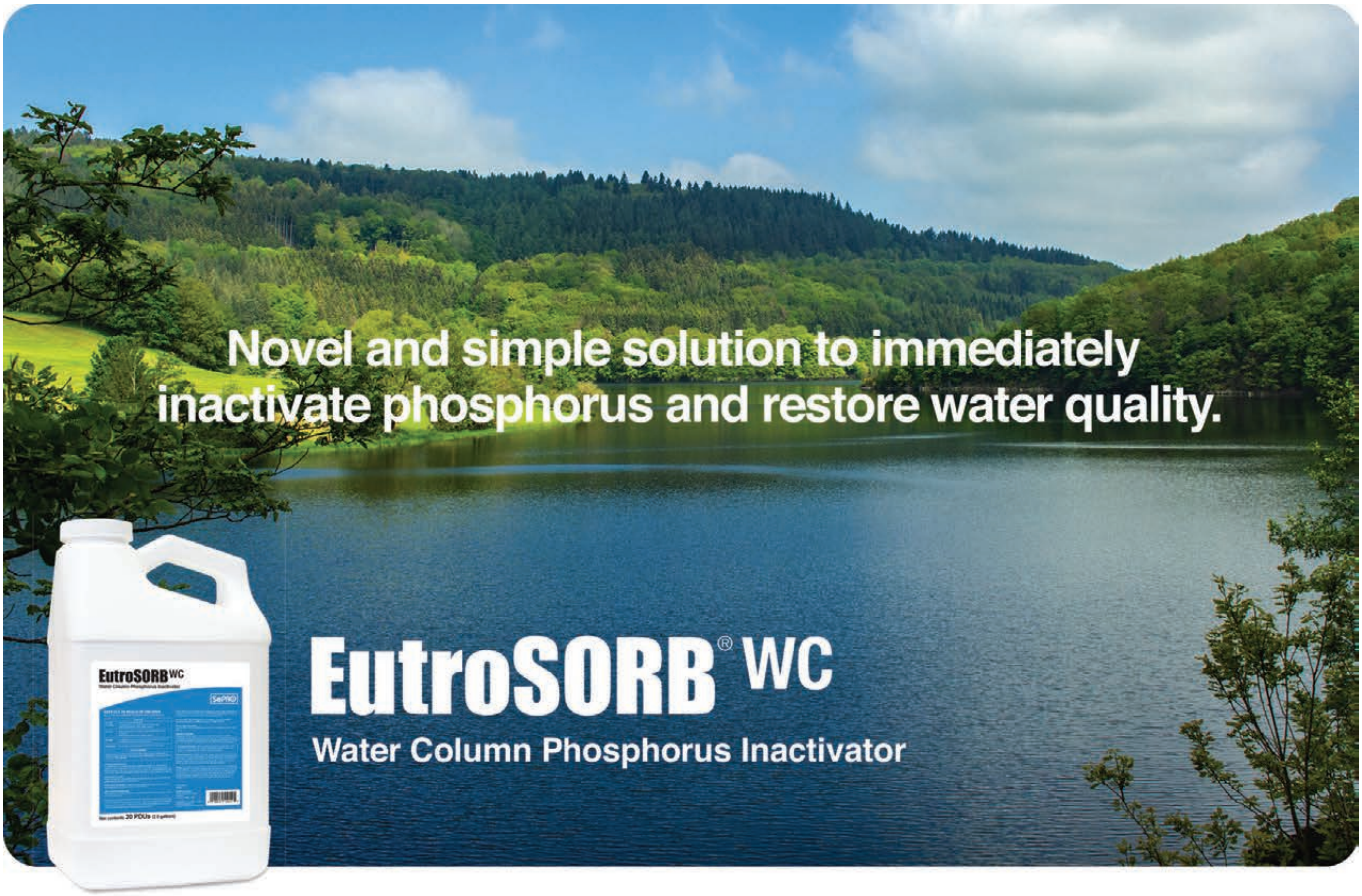
Registration Process Categories

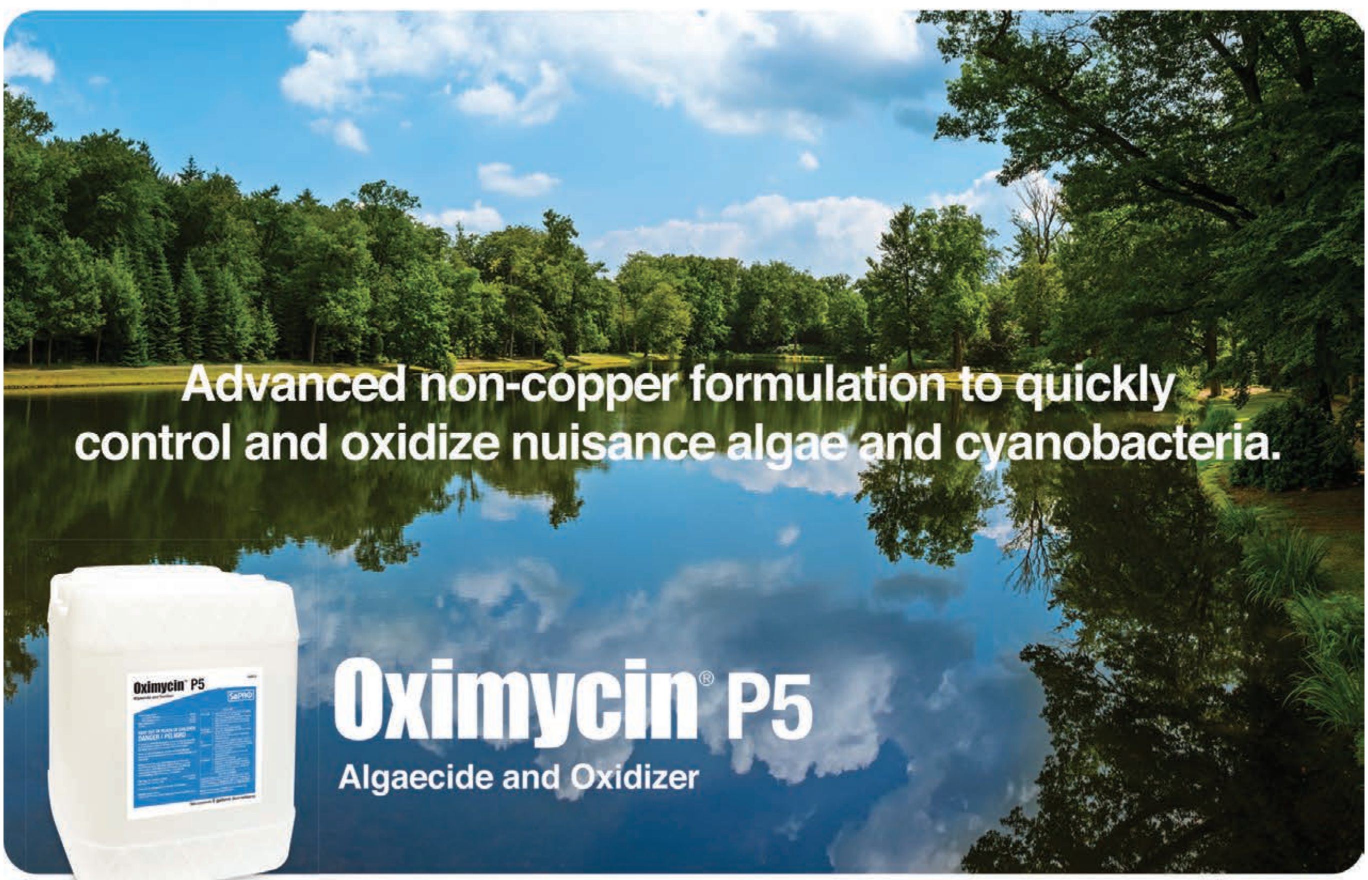
To put things into perspective, the registration process can take over 11 years until the pesticide product reaches the market.

Simply completing the extensive testing process for registration does not always lead to a registered product. The collective risk of all the test categories combined must be assessed and passed before becoming registered. In other words, this process is rigorous and many pesticides do not pass the extensive and expensive process.

The registration process is organized into nine risk categories. Together, these categories include over 240 types of scientific tests that provide important information about an herbicide's safety and effectiveness.

United State Environmental Protection Agency. (30 March, 2021). *Data Requirements for Pesticide Registration.*





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Product Chemistry

Studies related to the product chemistry refer to the manufacturing and characteristics such as flammability.

Product Performance

Studies used to ensure that the herbicide will control the plants listed on the label. These data also ensure that ineffective products do not enter our environment.

Human and Domestic Animal Exposure

These studies are used to assess the potential hazards to humans and domestic animals in a variety of scales; from short and long-term experiments to product metabolism (or how it breaks down in the organism).

For example, this series of studies ensure that consuming water that has been treated doesn't result in negative health impacts.

Non-target Organism Exposure

Studies used to examine the short and long-term effects on birds, mammals, fish, invertebrates, and plants. These studies start in a lab and progress into applied field tests.

For example, if a duck lands in a body of water that was just treated with herbicide to control waterhyacinth (the intended target), these tests evaluate the impact on the duck (non-target).

Applicator/Worker Exposure

These studies are used to evaluate the potential exposure risks to any workers applying herbicides as they may be exposed to higher concentrations while handeling the products.

For example, these studies determine the appropriate Personal Protective Equipment (PPE) to ensure the safety of those handeling the product.

Post-Application Exposure

Studies used to assess the hazards of an herbicide after it is applied to an area. This data helps inform how applicators and the public become exposed and how long they must wait until reentering treated areas.

For example, these series of tests determine the swimming restrictions of an aquatic herbicide, or how long someone should wait to enter a body of water after a treatment.

Product Spray Drift

Studies used to evaluate herbicide droplet size and deposition aid in understanding the potential risks from herbicide exposure to humans, wildlife, and the environment after being applied.

Spray drift is defined as the unintentional airbone movement of pesticides following treatment. For example, data from these studies determine what impact an aquatic herbicide used in a lake has on the nearby forest or creek.

Environmental Fate

Environmental fate studies relate to the presence and persistance of herbicides in the environment and how that may impact water quality, as well as, land and wildlife resources.

For example, these studies determine how long an herbicide persists in lake sediment after treatment.

Product Residue Chemistry

This category refers to the FFDCA which requires the EPA to determine that there is reasonable certainty that no harm will result from pesticide residue found in foods. This stage of the process involves combining the data found from the previous categories.

These data are combined and calculated to determine the amount of potential exposure estimates in food. This allows the EPA to set and enforce tolerance levels.

Information Adapted From

United State Environmental Protection Agency. (30 March, 2021). *Data Requirements for Pesticide Registration.*

Visit **epa.gov/pesticide-registration/data-requirements-pesticide-registration** for more detailed information

Florida Pineberry Cocktail

Recipe from Fresh From Florida
Florida Department of Agriculture and Consumer Services

Ingredients

1/2 cup Florida pineberries (about 7 pineberries) plus 2 whole ones for garnish

4 ounces Florida vodka

1 tablespoon Florida sugar

2 tablespoons fresh lime juice

6 sprigs fresh thyme

3/4 cup sparkling water or club soda

1/2 lime, sliced for garnish

Preparation

Remove tops from 7 of the Florida pineberries and lightly chop. Add chopped pineberries, 4 sprigs of thyme, lemon juice and sugar to the bottom of a cocktail shaker. Use a muddling stick to mash the pineberry mixture to release all the flavors. Add the Florida vodka and fill the shaker halfway with ice.

Place top on the shaker and vigorously shake for at least 30 seconds. Fill two tall collins glasses to the top with ice. Use a cocktail ice strainer to strain the pineberry mixture into the tall glasses filled with ice. Garnish each glass with a whole fresh pineberry, thyme sprigs and a slice of lime. Top each glass with chilled club soda to the top. Drink responsibly.


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Fun Florida Facts!

Florida is the boating and fishing capital of the world. It has more than 7,700 lakes, 11,000 miles of rivers, 2,276 miles of tidal shoreline, and has produced more than 900 world fishing records, more than any other state, or country.

Florida has more than 700 freshwater springs. Of them, 27 are classified as first-magnitude springs, more than any other state.

The city of Fort Lauderdale is known as the Venice of America because of its canal system, with 165 miles of local waterways.

The fishing village of Cedar Key is renowned for having the best clam chowder in America.

The 156-mile-long Indian River Lagoon is North America's most biologically diverse estuary.

Florida's largest river, the St. Johns River, is one of only a few major rivers that flow from south to north.

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