

# Floating aquatic plants

By Stephen Futch, Kenneth Jones and David Hall

The floating aquatic plants discussed in this article are frequently found in and around ditches, canals and ponds in or near citrus groves. These emergent aquatic weeds may need to be treated with herbicides to maintain adequate water flow in ditches and canals, thereby minimizing potential for grove flooding



or elevated water tables that will impact citrus root growth.

An additional article on submersed aquatic weeds is planned for the November issue of *Citrus Industry* magazine. An article on emerging aquatic plants was published in the May issue of *Citrus Industry*.



Kenneth Jones, 2013, University of Florida (UF) Center for Aquatic and Invasive Plants (CAIP)

## AMERICAN LOTUS

### *Nelumbo lutea*

**Leaves:** alternate; long-stalked; blades bluish-green, circular, 12 to 24 inches in diameter; may be floating or up to several feet above the water; floating leaves are flat whereas the emerged leaves are funnel-shaped; leaf stalk (petiole) attached to the leaf center (umbrella-like); blade veiny below, no split in the blade, which quickly distinguishes it from water-lilies and spatterdock

**Stem:** a long, thin, cylindrical rhizome with tubers

**Flowers:** solitary; on a thick, long stalk; pale yellow, up to 10 inches across with more than 20 petals

**Fruit:** cone- or shower-head shaped with multiple circular openings

**Seeds:** nutlike, hard, up to one-half inch in diameter

**Height:** grows underground (rhizome); can be rooted at depths of 6 to 8 feet; leaf stalks will reach surface and above

**Life cycle:** perennial

**Growth characteristics:** rooted, floating- or erected-leaved plant with thin rhizomes and tubers; reproduction by seeds and tubers; flowering May to August

**Distribution:** central peninsula north and west in Florida; occasional; margins of ponds and lakes and in prairies and slow-flowing streams

**Origin:** native

**Comments:** sometimes forms huge populations; dried seed heads are commonly used in flower arrangements



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## DUCKWEED

### *Lemna* spp.

**(Five species occur in Florida; all are quite similar; two are rare)**

**Leaves:** ovate or oblong to one-eighth inch long with no clear distinction between leaf and stem; leaves usually attached to each other; each leaf will have one slender root on the underside, somewhat shoe-shaped or egg-shaped

**Stem:** not distinguishable

**Flowers:** very tiny, rarely formed, seldom seen; contained in a pouch at the leaf base

**Seeds:** fruit and solitary seeds are ovoid to ellipsoid

**Height:** leaves lie flat on surface of water

**Life cycle:** reproduction through budding or seed germination

**Growth characteristics:** commonly found in association with other floating plants; can become a problem in protected areas by colonizing the entire surface; thick mats (often with more than one species) can reduce light and oxygen

**Distribution:** throughout Florida (three species); frequent; streams, rivers, ponds, lakes and sloughs

**Origin:** native

**Comments:** more of a problem when found in sluggish or still waters or in stagnant ponds



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## FRAGRANT WATER-LILY

### *Nymphaea odorata*

**Leaves:** alternate; long-stalked; blades floating, nearly round, lying flat on the water, deeply notched, lobes pointed, 6 to 18 inches in diameter; green on top and green tinged with red or purplish-red on the bottom

**Stem:** a horizontal, thick, branched rhizome

**Flowers:** solitary; on long stalks; white, consisting of 25 or more petals that are ovate-lanceolate; petals are 3 to 4 inches in length

**Fruit:** depressed globe-shaped fruit that is approximately 1 inch in size; ripens under water

**Seeds:** oblong-oval, grayish olive to orange, less than one-tenth inch

**Height:** grows underground (rhizome); can be rooted at depths to 8 feet; leaf stalks will reach surface

**Life cycle:** perennial herb

**Growth characteristics:** rooted, floating-leaved plant with branched rhizomes; leaf stalks attached near center of floating blade at top of split; can grow in water that is up to 8 feet deep; flowers from April to December in Florida; reproduces by seeds and branching rhizomes

**Distribution:** throughout Florida; common; mostly in ponds, lakes, slow streams, canals and ditches

**Origin:** native

**Comments:** can grow in densities that affect water flow and use

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Ann Murray, 2001, UF CAIP

## FROG'S BIT

### *Limnobiium spongia*

**Leaves:** from vertical stems, heart-shaped, to about 2¾ inch long and wide, leaf tip blunt or rounded; out-of-water leaves are robust, leathery and on long stems, the partially submerged leaves thickened by spongy air tissue

**Stem:** vertical stems from horizontal runners

**Flowers:** solitary, from leaf axils, on short stalks approximately one-third length of the leaves, three sepals, three petals, narrow and white

**Fruit:** many-seeded, ovoid berry on a short, thick, curved stalk

**Seeds:** minutely spiny

**Height:** approximately 12 inches tall

**Life cycle:** aquatic perennial herb

**Growth characteristics:** spreading by runners from mature plants, rooted in the mud or floating; flowers from May through October

**Distribution:** throughout Florida; occasional; shallow water of ponds, lakes and ditches

**Origin:** native

**Comments:** reproduces readily by seed and vegetatively from runners; grows well in floating mats or rooted in muddy substrate; often confused with water hyacinth whose leaf stalks are not much inflated



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## MOSQUITO FERN

### *Azolla caroliniana*

**Leaves:** bilobed, overlapping, less than one-sixteenth inch wide and long, green (especially in winter), with reddish margins, or reddish; young plants are green; maturing plants turn red to dark brown by fall or winter, especially in full sun

**Stem:** short with forked branching, one-quarter to 1 inch long, with thin roots

**Flowers:** male and female spores are borne in separate containers (sporocarps) in the axils of the leaves; sporocarps are miniscule

**Seeds:** does not have seeds, but reproduces by spores

**Height:** one-sixteenth to one-eighth inch, low growing, at water surface

**Life cycle:** a small free-floating fern, reproduction by spores

**Growth characteristics:** grows equally well rooted in mud or free-floating; floating plants can propagate rapidly by spores and plants breaking apart

**Distribution:** throughout Florida, mainly from north-central into southern Florida; frequent; ponds and swamps

**Origin:** native

**Comments:** reproduces very rapidly, forming large floating mats that impair navigation, water flow and recreation



Kenneth Jones, 2013, UF CAIP

## SPATTERDOCK

### YELLOW COW-LILIES

### YELLOW WATER-LILIES

#### *Nupha advena*

**Leaves:** alternate; long-stalked; blades heart-shaped, deeply notched, with rounded lobes; usually more long than wide, up to 16 inches long and up to 10 inches wide; light green to transparent in color; leaf blades extend above the water or float below or on the surface

**Stem:** thick, horizontal branching rhizome

**Flowers:** solitary; on long stalks; at or above water surface; green to yellow petal-like sepals; six to nine very small, yellow, cup-shaped petals

**Fruit:** stalked, flat-topped, yellow to greenish in color; usually borne at or above water surface.

**Seeds:** 30 or more seeds per seed head

**Height:** grows underground (rhizome); can be rooted at depths to 8 feet; leaf stalks will reach surface and above

**Life cycle:** perennial herb

**Growth characteristics:** floating- or erect-leaved plant with large spongy rhizomes; reproduction by seeds and branching rhizomes; flowering from spring into fall

**Distribution:** throughout Florida; common; mostly in ponds, lakes, slow streams and ditches

**Origin:** native

**Comments:** can grow in densities that affect water flow and use

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Vic Ramey, 1998, UF CAIP

## WATER FERN WATER SPANGLES *Salvinia minima*

**Leaves:** occur in threes, two-paired and floating, and one is finely dissected and dangling underneath; floating leaves expanded and show a folded appearance down the center, bluish-green in color, broadly rounded; bases notched, three-quarter inch in size, arising from stem beneath, upper surface covered with stiff, branched hairs and dark hairs on the under surface

**Stem:** tiny, rootless, hairy

**Flowers:** hard, nutlike pods on the dissected, trailing rootlike leaves

**Seeds:** does not have seeds, but reproduces by spores

**Height:** a few sixteenths of an inch, low growing at water surface

**Life cycle:** a small free-floating fern; reproduction by spores, but leaves breaking away the axis portion multiply rapidly

**Growth characteristics:** free-floating fern that can grow into extensive mats

**Distribution:** throughout Florida, primarily north-central to southern Florida; common; ponds and swamps

**Origin:** South America

**Comments:** free-floating in still or sluggish water, lakes, ponds and ditches; does not have roots; in protected areas, it can form extensive mats that can impair navigation, water flow and recreation



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## WATER HYACINTHS *Eichhornia crassipes*

**Leaves:** clustered in rosettes; stalked, stalk to 12 inches long, inflated and more or less ovoid; filled with spongy air tissue; blade subcircular to 6 inches wide, ovate to broadly elliptic

**Stem:** very short, clusters of leaves are produced at the nodes of a runner (stolon)

**Flowers:** inflorescence a showy spike to 12 inches long; several flowers from each bract; six petals, blue or white, light lavender to pinkish with a bright yellow marking on the upper petal, somewhat two-lipped, six stamens, of two sizes

**Seeds:** many, found in three-celled capsule

**Height:** ranges from a few inches to 3 feet

**Life cycle:** herbaceous, aquatic perennial reproduces primarily by vegetative means; seeds sink and remain dormant until drought period when they can germinate

**Growth characteristics:** rapid reproductive potential with as few as 10 plants able to cover an acre of surface area; flowering in spring, summer and fall

**Distribution:** throughout Florida; common; ponds, lakes, sloughs, canals, streams and ditches

**Origin:** South America

**Comments:** floating aquatic herb, plant spreading by short runners; roots are dark, fibrous and contain many branches; can sustain growth in soupy mud; sometimes leaf stalks show very little swelling; often confused with frog's bit whose leaf stalks are not inflated



Ann Murray, 2001, UF CAIP

## WATER LETTUCE *Pistia stratiotes*

**Leaves:** rosettes of dusty gray-green leaves, ovate to obovate, densely hairy, 1¼ to 6 inches long, arranged spirally around central axis; veins run the length of the leaf and are more obvious on the underside of the leaf; tip nearly flat or slightly notched; base tapering

**Stem:** very short; clusters of leaves are produced at the nodes of a runner (stolon)

**Flowers:** tiny, found in small, folded bract, but seldom seen; flowering year round

**Seeds:** rough, warty coat in a green fruit

**Height:** similar to length of leaves, 1¼ to 6 inches

**Life cycle:** floating aquatic herb; flowering year-round in Florida; although seeds are important for reproduction and dispersal, primarily reproduces by vegetative offshoots formed on short runners (stolons)

**Growth characteristics:** very rapid growth, primarily vegetative from fragments, budding, and runners (stolons)

**Distribution:** throughout Florida; common; in ponds, lakes, lagoons, ditches, drainage canals and swamps

**Origin:** unclear, but it is a non-native plant in the United States

**Comments:** floating aquatic herb with masses of feathery roots; reproduces primarily by budding from the main plant or producing plants at nodes on stolons; can form huge mats

## SELECTED SOURCES

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Stephen Futch is a multi-county citrus Extension agent and Kenneth Jones is a senior biological scientist with the Center for Aquatic and Invasive Plants; both are at the Citrus Research and Education Center in Lake Alfred; David Hall is a retired botanist with the University of Florida departments of Botany and Natural Sciences in Gainesville.