



The Curious Case of Arizona's Morning Glories (*Ipomoea* spp.)

Andrew Brischke



Photo 1. Morning glories (*I. triloba* shown here) often have long twining stems and funnel shaped flowers.

Introduction

Arizona is host to an extremely rich and diverse flora due to our varying climate, elevation, soils, and ecological zones amongst other factors. The state has almost 4,000 species of native plants, unmatched by most regions of the United States (ANPS, 2019). Of those nearly 4,000 native species, Arizona has 12 species of native morning glories (*Ipomoea* spp.) (Table 1). Morning glories, both annual and perennial, are typically herbaceous plants with many cultivated varieties being a favorite ornamental for home gardeners. Morning glories often have long stems that climb and twine, with leaves being large and heart-shaped or lobed. Flowers are funnel-shaped and vary in color from violet or blue to red, pink, and white (UC IPM, 2019) (Photo 1).

Table 1. Native morning glories in Arizona.

Species	Common name
<i>I. barbatisepala</i>	canyon morning glory
<i>I. cardiophylla</i>	heartleaf morning glory
<i>I. coccinea</i>	star-glory morning glory
<i>I. costellata</i>	crestrub morning glory
<i>I. leptotoma</i>	tripleleaf morning glory
<i>I. longifolia</i>	pinkthroat morning glory
<i>I. plummerae</i>	Huachuca Mountain morning glory
<i>I. pubescens</i>	silky morning glory
<i>I. purpurea</i>	tall morning glory
<i>I. tenuiloba</i>	spiderleaf morning
<i>I. Thurberi</i>	Thurber's morning
<i>I. triloba</i>	littlebell morning glory

It was a curious case in Arizona where most morning glory species and cultivated varieties were listed as Prohibited Noxious Weeds, meaning they could not be sold in Arizona. It was even more curious that a few of our native endemic morning glory species, e.g. Thurber's morning glory (*I. thurberi*), still could not be sold in Arizona (Photo 2). It is uncommon for such restrictions to be placed on native plants.



Photo 2. Thurber's morning glory (*I. thurberi*) is an endemic species to Arizona.



Photo 3. Three-lobed morning glory (*I. triloba*) is a Class C Noxious Weed and still cannot be sold in Arizona.

What is the Noxious Weeds list and what are the 2020 changes to the list?

The Arizona Department of Agriculture (ADA) developed a Noxious Weed list which regulates certain plants at varying degrees (ADA, 2019). Noxious weeds include any plant designated by a federal, state, or county government as a significant threat to local ecosystems, fish and wildlife habitat, and agricultural crops. Noxious weeds are regulated with respect to their transport, sale, and eradication efforts (McReynolds and Dolan, 2016). Prior to January 4, 2020, morning glories (with some exceptions) were considered Prohibited Noxious Weeds.

New rules to the noxious weeds list implemented on January 4, 2020 have changed the classification and listing of some of our noxious weeds. Instead of the "Regulated Pest," "Restricted Pest," and "Prohibited Noxious Weeds" classifications, ADA now classifies noxious weeds into Class A, B, or C noxious weeds. With this new classification system, native morning glory species were removed from the Noxious Weed list, with the exception of tall morning glory (*I. purpurea*), a Class C Noxious Weed. Some non-native species listed as Class C Noxious Weeds include: grannyvine (*I. tricolor*), ivyleaf morning glory (*I. hederacea*), three-lobed morning glory (*I. triloba*) (Photo 3), and whitestar morning glory (*I. x leucantha*).

Noxious Weed Definitions

- Class A Noxious Weed: categorized as a species of plant that is not known to exist or of limited distribution in the State and is a high priority pest for quarantine, control, or mitigation.
- Class B Noxious Weed: categorized as a species of plant that is known to occur, but of limited distribution in the State and may be a high priority pest for quarantine, control or mitigation if a significant threat to a crop, commodity, or habitat is known to exist.
- Class C Noxious Weed: categorized as a species of plant that is widespread but may be recommended for active control based on risk assessment (ASS, 2019).

Restrictions

- No class A, B, or C Noxious Weed, or commodity infested with a Class A, B, or C Noxious Weed, shall be admitted into the state unless otherwise authorized by the Associate Director.
- The Department may quarantine and abate an area infested or contaminated with a Class A or Class B Noxious Weed if it has been determined by the Associate Director that an imminent threat to agriculture or horticulture exists.

Since most morning glories have been removed from the noxious weed list, Arizona residents will be able to buy delisted morning glory plants, including sweet potatoes (*I. batatas*) that were technically illegal under previous regulations.

Why were morning glories listed as a Prohibited Noxious Weed?

Morning glories are in the Convolvulaceae family, or the morning glory family. Though morning glories have visually appealing, delicate flowers, some species have extensive root systems that can out-compete other vegetation, including backyard gardens and agricultural crops (Photo 4). Morning glories have a close relative also listed as a Class C noxious weed, field bindweed (*Convolvulus arvensis*), that resides in the same family. Field bindweed root systems can reach up to 20' below ground and have extensive lateral roots known as rhizomes that have buds that can initiate new plants (Gornish and Howery, 2019) (Photo 5). If you have ever had the pleasure of managing a field bindweed infestation, you can appreciate the challenges in eradication for even a small invasion. Field bindweed infestations led to crop losses of over \$377 million per year in 10 US states (Boldt et. al., 1998). In California, herbicide treatment costs have ranged from \$25 up to more than \$100 per acre in affected areas (Rosenthal, 1983).



Photo 4. Morning glory (*Ipomoea spp.*) root system.



Photo 5. Root system of a young field bindweed (*C. arvensis*) plant. Note the extensive lateral root system with new root buds and development of a new shoot.

Management of morning glories

Morning glories are often cultivated as ornamentals. However, under favorable conditions they can become a nuisance and are troublesome. Plants in the Morning Glory family are persistent and difficult to control. Native or ornamental annuals are much easier to control than their perennial relatives. Control of native or ornamental perennials is critical from crop emergence to harvest, and successful eradication can rarely be accomplished with a single treatment or season.

Seeds can remain viable in soil for long periods, in some cases up to 50 years (WSNWCB, 2019). If seeds have accumulated and infestation has become a problem, destroy seedlings while they are small. Seedlings are relatively easy to control through cultivation or hoeing but once plants have established they are difficult to control. This is particularly true once they have twined up stems, making it difficult to remove without harming other plants. Repeated cultivation may be required every 2-3 weeks to be an effective control. Shading or competing plants have demonstrated some success in controlling morning glory infestations.

Chemical control can be effective for suppression of morning glories, but not very effective for eradication. In ornamental landscape settings, field bindweed grows between and up through plant canopies. Products containing trifluralin, oryzalin, or pendimethalin applied pre-emergence will reduce perennial shoots and germinating seedlings, but they will not kill established plants. In open

areas where there are no desirable plants, a 2% glyphosate solution is effective when plants are actively growing without moisture stress. Glyphosate may take up to three-weeks to kill the top growth, but it is effective even though eradication is not always possible. Repeated applications are necessary with glyphosate as it does not have residual activity. Additionally, glyphosate will not affect germination of seed, so seedlings will have to be controlled with mulch, pre-emergent herbicides, or persistent cultivation as mentioned above (UC IPM, 2019).

Summary

Morning glories used to have the privilege of being classed as a strange contradiction. Though we have many native morning glory species, most of our natives were considered Noxious Weeds and, aside from a couple exceptions, could not be sold in Arizona. However, with the new rules and noxious weed classifications, effective January 4, 2020, most morning glories have been removed from the list and can now be sold in Arizona.

Caution should be used when planting morning glories as they were previously prohibited for a reason; they can get out of hand quickly and become a nuisance or drastically impact a backyard garden or agricultural crops. In addition, morning glories are very difficult to eradicate once an infestation has been established. However, if you like the appeal of the delicate and colorful flowers in your garden, you will now be able to buy them from your seed or plant suppliers.

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- Figure 2: Sue Carnahan. SEINet Portal Network. <http://swbiodiversity.org/seinet/index.php>. Accessed on December 11, 2019.
- Figure 3: USDA APHIS PPQ – Oxford, North Carolina, USDA APHIS PPQ, Bugwood.org.
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- Figure 4: Lynn Sosnoski. 2018. Cornell AgriTech. <https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=28048>.



THE UNIVERSITY OF ARIZONA

Cooperative Extension

THE UNIVERSITY OF ARIZONA
COLLEGE OF AGRICULTURE AND LIFE SCIENCES
TUCSON, ARIZONA 85721

AUTHOR

ANDREW BRISCHKE

Area Assistant Agent, Agriculture Natural Resources (Mohave and Coconino)

CONTACT

ANDREW BRISCHKE

brischke@email.arizona.edu

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