







What constitutes an invasive plant?

**“Introduced,”
“non-native,”
and “exotic”
are catch-all terms**

“Escaped” plants have spread from cultivation via seeds, bulbs, rhizomes, etc.



Tristagma uniflorum
Springstar

Waif—Occasionally found outside of cultivation



Citrullus lanatus Watermelon

Photo: Shu Suehiro

“Naturalized” applies to a plant that has become a freely-reproducing part of the flora.



Trifolium incarnatum

Crimson Clover

Sweet Clover



Henbit



Shepherd's Purse



“Adventive” often denotes an exotic that is not a problem.

Yet

“Invasive” plants spread uncontrollably and negatively affect agriculture or ecosystems.



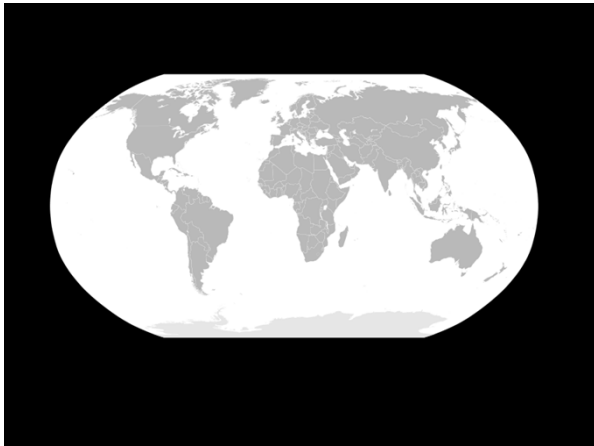


Pueraria montana

Kudzu

Photo: Jan Kronsell

**Where did they
all come from?**



How do weeds get here?



Blown or drifted in
on wind or waves.

Sonchus asper

Sow Thistle



Transported by
birds, mammals,
and insects.

Photo: John Harrison





As a contaminant
in seed

Lactuca serriola

Prickly Lettuce

As a contaminant in ballast, soil, road fill, mulch, etc.

Zeuxine strateumatica

Soldier's Orchid
Lawn Orchid



As a contaminant in transported hay or livestock

Solanum viarum

Tropical Soda Apple








**As a hitch-hiker
on animals,
clothing, cars,
etc.**

*Xanthium
strumarium*

Cocklebur

A close-up photograph of a Cocklebur plant (Xanthium strumarium). The plant has large, green, lobed leaves and a stem with several small, yellow, spiky flower heads. The background is blurred. A small copyright notice "COPYRIGHT J.R. MANNHART" is visible in the bottom left corner of the image.

A photograph of a Tasselflower plant (Emilia fosbergii) growing in a blue nursery pot. The plant has large, green, lobed leaves and several bright red, spiky flower heads. The soil in the pot is visible. A small copyright notice "COPYRIGHT J.R. MANNHART" is visible in the bottom left corner of the image.

**As a weed in
nursery stock**

*Emilia
fosbergii*

Tasselflower

**Hines Nursery
in Houston**






Many Plants Introduced For

- Food (wheat, oats, cucurbits...)
- Medicine (shepherd's purse, dandelion, horehound...)
- Forage (sweet clover, alfalfa, K.R. Bluestem...)
- Erosion control (kudzu, crown vetch, clovers...)
- Ornament (honeysuckle, mimosa, ruellia)





Sold as "Wildflowers"



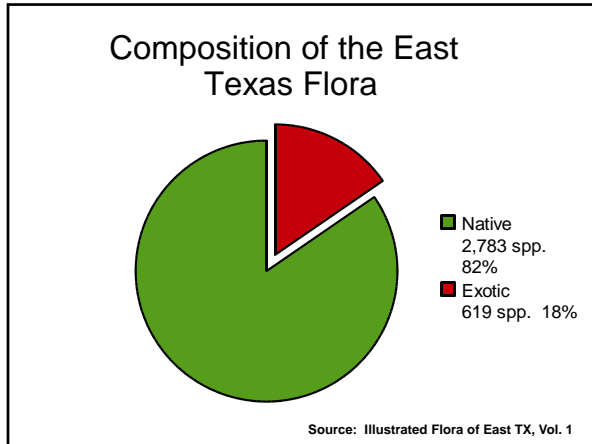
- Texas Bluebonnet...A...18.90%
- Indian Blanket...A...8.00%
- Scarlet Flax...A...6.60%**
- Tickseed...P...6.45%
- Lemon Mint...A/P...6.23%
- Purple Coneflower...P...5.86%
- Drummond Phlox...A...5.29%
- Cornflower...A...4.40%**
- Rocket Larkspur...A...4.40%**
- Baby Blue Eyes...A...4.40%**
- Ox-Eyed Daisy...P...4.18%**
- California Poppy...A/P...3.14%
- Yellow Cosmos...A...2.86%
- Tall Poppy Mallow...A...2.86%
- Golden-Wave Coreopsis...A...2.75%
- Plains Coreopsis...A...2.24%
- Clasping Coneflower...A...1.98%
- Black-Eyed Susan...A/P...1.76%
- Tuber Vervain...P...1.44%
- Corn Poppy...A...1.40%**
- Spurred Snapdragon...A...1.21%**
- Dwarf Red Coreopsis...A...1.10%
- Standing Cypress...P...1.00%
- Showy Primrose...P...77%
- Mexican Hat...A/P...56%
- Texas Paintbrush...A/P/B...22%

“...During the course of researching Brooklyn Botanic Garden's influential 1996 handbook **Invasive Plants: Weeds of the Global Garden**, my colleagues and I were dismayed to discover that **about half of the worst invasive plants** currently degrading natural habitats from coast to coast were brought here intentionally, for horticultural use.”

Janet Marinelli

We did this to ourselves.

So how many are we talking about?



Invasive may vary from one situation to another.

A plant's potential to be invasive may change over time if conditions (rain, disturbance, fire regime, etc.) change to favor it over native plants.

Some plants are invasive in one region and well-behaved elsewhere



Lilac Chaste Tree *Vitex agnus-castus*

**Sometimes,
old plant + new plant = big problem**



Pyrus calleryana

Bradford Pear

Texas non-native plants

- * Fundamental Invasive Index [INDEX](#)
- * All species, with index rankings [COMPLETE LIST](#) [EXCEL FILE](#) [PDF](#)
- * All aquatic species, grouped by Invasive Index ranking [ALL AQUATIC](#)

Numbers of non-native species in Texas ranked as F1, F2, F3, and F4. The total is 430 species.

Rank	Woody	Herbaceous	Aquatic	TOTAL
F1	17	23	0	40
F2	13	229	18	258
F3	76	254	0	430
F4	0	80	0	80

Comments, suggestions, or questions about any of these lists, rankings, or concepts are sought and welcomed. Post and read comments in blog format: [BLOG](#)

- * Species ranked as F1 [F1](#)
- * Species ranked as F2 [F2](#)
- * Watch List [WATCH](#)
- * Expected List [EXPECTED](#)

But how bad can they be?

- Crop losses of ca. 12%
- Millions spent on eradication
- Lost revenue from unacceptable crops
- Competition with native plant species
- Loss of food and habitat for native animal species
- **Fundamental alteration of the habitat**



Why does Texas have such a problem?

Texas has a long border, has major ports, is a shipping crossroads for the continent, and has a rich immigrant culture.

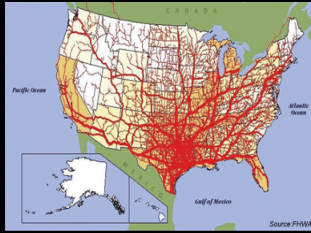


Image Source: National Highway Administration

Texas has no single agency with the authority to make weed policy or impose or enforce sanctions.



Rosa bracteata McCartney Rose


© 2001 David E. Lemke



Texas has no central agency with a large budget to eradicate invasive species.

Alternanthera philoxeroides Alligator Weed

The Texas Department of Agriculture Noxious Weed List consists of fewer than thirty plants



Ligustrum spp. Ligustrum

House bill # 338 I would require that "a public entity, other than the department (of Agriculture), that produces a list of noxious or invasive terrestrial plant species growing in this state shall provide with the list a disclaimer that states:

"THIS PLANT LIST IS ONLY A RECOMMENDATION AND HAS NO LEGAL EFFECT IN THE STATE OF TEXAS. THE TEXAS DEPARTMENT OF AGRICULTURE HAS SOLE AUTHORITY TO LABEL TERRESTRIAL PLANTS AS NOXIOUS OR INVASIVE."

There are not enough people trained in weed identification or trained to recognize exotics.



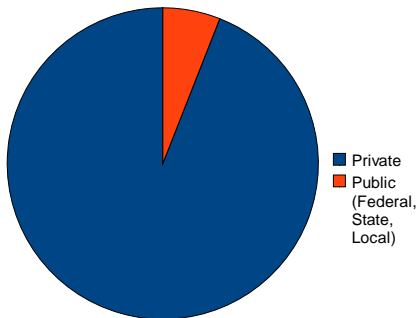
Ipomoea aquatica Water Spinach, Kang Kung, Ong Choy...

Identification guides may not be readily available for non-native species.



Orobanche ramosa
Branched Broomrape

Land Ownership in Texas



One man's weed is another man's fail-proof landscape plant.



Melia azedarach Chinaberry, Persian Lilac

Photo: Shaista Ahmad, Flowers of India

Aggie Horticulture AgriLIFE EXTENSION

Earth-Kind

Home Landscape Commercial Master Gardener JMSB Earth-KindB County/Regional People Search

Earth-Kind® Plant Selector

In Texas there are hundreds of plants to choose from for use in home and commercial landscapes. Trying to find just the right plant for a specific location can be challenging. Ensuring that your selection is also well adapted to the environment makes this decision even harder.

The Earth-Kind Plant Selector, part of the Texas Urban Landscape Guide can be an extremely useful tool for the urban gardener. This searchable database provides users with the opportunity to select plant materials based on factors such as height, width, flower color, hue or shade, bloom period, leaf character, as well as several other matching criteria.

Each plant in the database is rated for heat tolerance, drought tolerance, pest tolerance, soil requirements and fertility requirements based on region. The Earth-Kind Index value (which ranges from 1 - 10) is a measurement based on all 5 of these resource efficiency categories. The higher the number, the more resource efficient a plant is in that region. Plants with an Earth-Kind Index value of 8 or higher are considered to be extremely resource efficient and are generally heat tolerant, drought tolerant, pest tolerant, with minimal soil or fertility requirements for the selected region.

[Making Plant Selections >>>](#)

- Earth-Kind Home
- Earth-Kind Challenge
- Planning the Home Landscape
- Plant Selector
- Publications
- Master Gardener Training
- Additional Resources

- Making Plant Selections
- About Invasiveness
- Go to the Earth-Kind Plant Selector

Aggie Horticulture AgriLIFE EXTENSION

Earth-Kind

Home Landscape Commercial Master Gardener JMSB Earth-KindB County/Regional People Search

About Invasiveness

The Earth-Kind Plant Selector rates plants **STRICTLY** on the basis of resource efficiency (drought tolerance, heat tolerance, pest tolerance, soil requirement, fertility requirements). It **DON'T** provide information concerning the potential invasiveness of landscape plant materials. It is likely that plants with a high Earth-Kind Index value will be more "aggressive" in their growth habit than plants with a lower value.

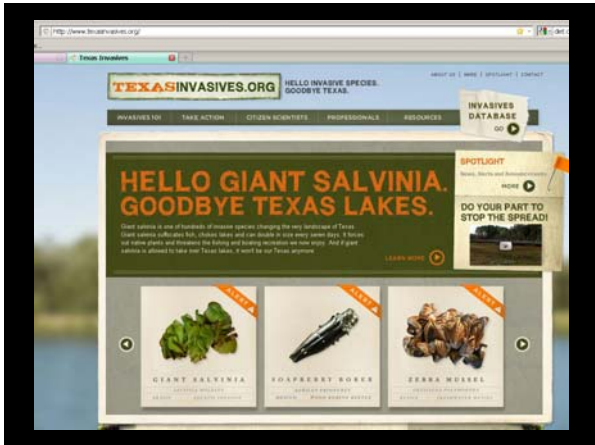
None of the plants included in the Earth-Kind Plant Selector database currently appear on the Texas Department of Agriculture's list of invasive and noxious plants.

For additional information on plant invasiveness we invite you to visit the TexasInvasives.org web site. TexasInvasives.org maintains an online database devoted to plants known to occur in or around Texas that are suspected of causing invasive problems. The purpose of this site is informational and educational and it is not intended to be a regulatory tool. Many of the species on this list are economically important horticultural plants but sometimes cause problems when they escape and establish in natural areas.

- Earth-Kind Home
- Earth-Kind Challenge
- Planning the Home Landscape
- Plant Selector
- Publications
- Master Gardener Training
- Additional Resources

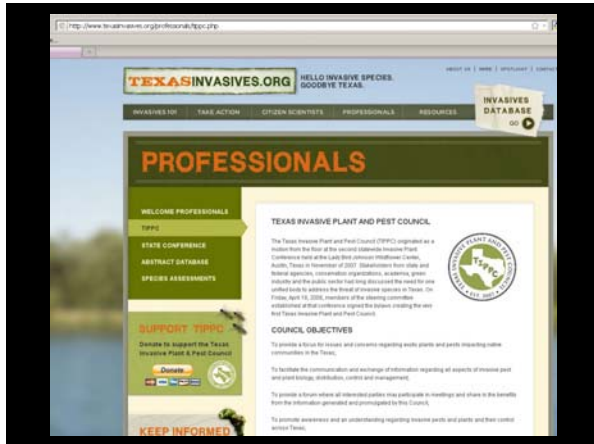
- Plant Selector Intro
- Making Plant Selections
- About Invasiveness
- Go to the Earth-Kind Plant Selector

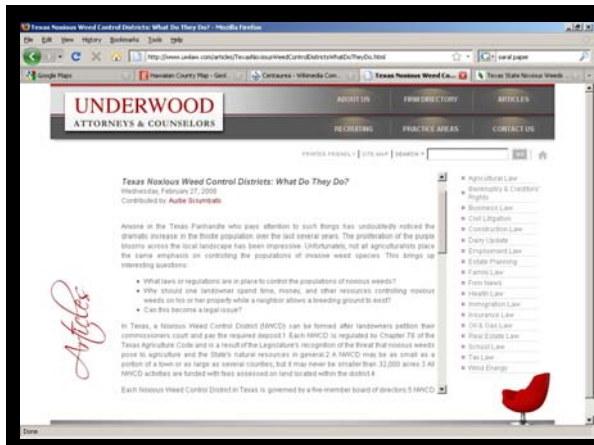
Yikes!
Is anything being done?



Pulling Together Initiative
Texas Parks and Wildlife Dept.
Texas Forest Service
Lady Bird Johnson Wildflower Center
U.S. Fish and Wildlife Service
National Biological Information Infrastructure

And others



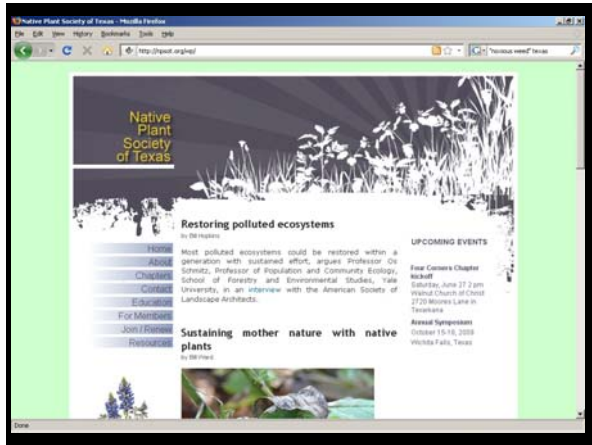




Educate Yourself



Scabiosa atropurpurea Pincushions, Sweet Scabious



Volunteer



Lonicera japonica Japanese Honeysuckle

Photo: Steven J. Baskauf



Viburnum rufidulum Rusty Blackhaw



Prunus caroliniana Carolina Laurelcherry

The Plantwise program gives gardeners easy tips on how to manage their garden to preserve the unique qualities of neighboring outdoors. It is a partnership between the National Park Service, the Lady Bird Johnson Wildflower Center, The Garden Club of America, National Invasive Species Council, Student Conservation Association and many others to reduce invasive plants in the urban landscape.

PLANTWISE GUIDELINES

#9 **Dispose of invasive plants carefully.** When disposing of invasive plant material consider whether there are any seeds, fruits or cuttings that could re-grow. At a minimum, bag these materials to help prevent their spread. Try freezing seeds, fruits and cuttings so they will make them non-viable. Or consider pruning or removing invasive plants before they produce fruit or seeds. If it is permitted in your area and can be safely done, consider burning the plant material. Learn more about this: [Plantwise Guidelines](#)

INVASIVE FACTS

- Invasive species - a species that is non-native or alien to the ecosystem under consideration and whose introduction does or is likely to cause economic or environmental harm or harm to human health.
- Invasive species are the number one threat to native biodiversity on protected lands.
- Invasive plants are costing over \$100 billion annually in the U.S. alone per year of U.S. wildlife habitat.
- Scientists estimate that invasive plants cost our economy \$28 billion in damages and treatment each year!

Educate friends, neighbors, and nurserymen, and ask nurseries to carry natives.



Eichhornia crassipes

Water Hyacinth

While shopping today, I noticed that you stock the following plant(s), which, to my knowledge, is known to be invasive in Texas's natural areas:

Please consider stopping the sale of this plant(s).

Name: _____
Ph: _____ Date: _____

Note to Retailer:

The shopper who left this card is one of many Texans who are concerned about the impact of invasive plants on the state's natural areas. Some of these plants are still for sale through the nursery trade. To learn more about invasive plants, as well as "wildland-safe" landscaping alternatives, please visit our website at <http://www.texasinvasives.org>. Thank you for your interest in stewarding our precious natural resources.

Voice your opinion: state and local ordinances, homeowners' associations, parks boards, etc.




Nandina domestica
Bamboo

Heavenly

Photo: Berlin Botanical Gardens Berlin-Dahlem


Plant Identification Basics



Humans
Are
Pattern
Seekers

Photo by Mark von Holden

Those botanists have a word for *everything!*



epigynous

actinomorphic

bicarpellate

salverform

entomophilous

herbaceous

heterostylous

sympetalous

Growth Form



Trees are woody, are usually more than 15 to 20 feet tall, and usually have a single trunk.

Growth Form

Shrubs are woody, are usually less than 15 to 20 feet tall, and usually have more than one stem.



Growth Form



Sometimes it's hard to tell the small trees from the large shrubs

Growth Form



Herbs have no woody tissue. They may live for only a season or two or come back from the roots each year.

Growth Form



Vines may be woody or herbaceous.

Leaf Duration



Evergreen leaves persist for more than one season. They may be broad and flat or needle- or scale-like.

Leaf Duration



Deciduous leaves are shed during the cold or dry season

Leaf Arrangement



Alternate
Leaves are borne one per node.

Leaf Arrangement



Opposite leaves are borne two per node

Leaf Arrangement

Whorled leaves are borne three or more per node.



Look for the axillary bud.



At the base of each leaf, in the angle between stem and leaf stalk (petiole), is a bud. Anything beyond that is one leaf.

Simple Leaf



The blade is in one piece, not divided to the midrib. The margin (edge) may have teeth or lobes.

Once Pinnately Compound Leaves



Leaves are divided to the midrib. The leaflets may be odd or even in number and are borne along a central axis or **rachis**.

Twice Pinnately Compound Leaves

The primary leaflets are themselves divided into secondary leaflets.



Palmately Compound Leaves



The leaflets all arise from the same point like the fingers of a hand.

Quiz Time!



Floral Symmetry



Actinomorphic
or **Regular**
flowers have radial
symmetry.

They have many
axes of symmetry.

They can be divided
into matching halves
in more than one
way.

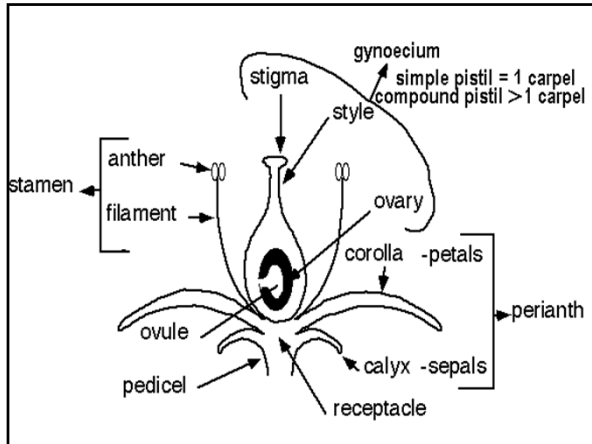
Floral Symmetry

Zygomorphic or
Irregular flowers have
bilateral symmetry.

They have only one axis
of symmetry.


There is only one way
to divide the flower into
equal halves (which are
mirror images of one
another.)





Flower Anatomy


Calyx: the outer whorl of sepals; typically these are green, but are petal-like in some species.



Flower Anatomy

Corolla: the whorl of petals, which are usually thin, soft and colored to attract animals that help the process of pollination.

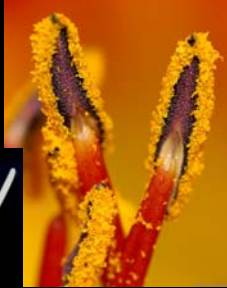
The coloration may extend into the ultraviolet, which is visible to the compound eyes of insects, but not to the eyes of birds.



Flower Anatomy

Androecium (from Greek *andros oikia*: man's house): one or more stamens, each with a filament topped by an anther where pollen is produced.

Pollen contains the male gametes.

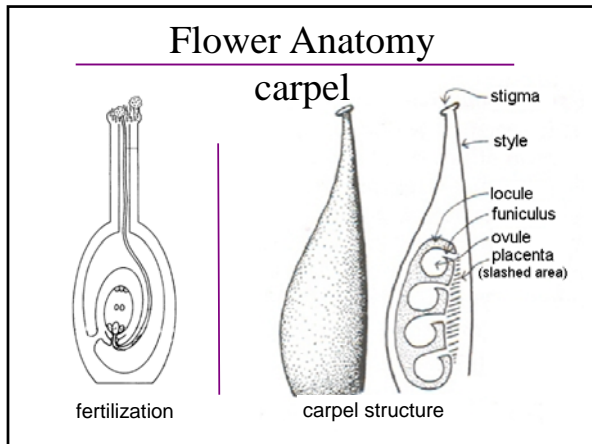


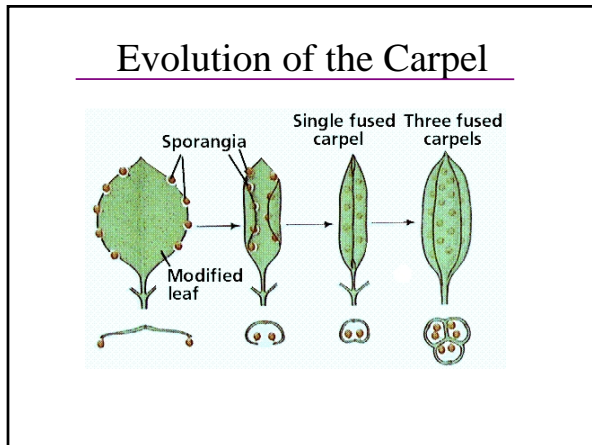
Flower Anatomy

Gynoecium (from Greek *gynaikos oikia*: woman's house): all the female parts—the pistil(s) with ovule(s) inside.









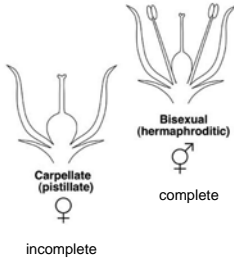


Flower Structure Variation

A flower having sepals, petals, stamens, and pistils is complete; if a flower is lacking one or more of these whorls, it is said to be incomplete.



no stamens present = incomplete



Unisexual or Imperfect Flowers



Pistillate flowers have no stamens, only female parts

Staminate flowers have no pistils, only stamens




Pollen Dispersal

Bees, Beetles, Bats, Birds, Butterflies, Wind, Water, etc...



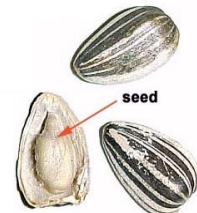
Fruit and Seed Formation

A fruit develops from an ovary. A seed develops from an ovule.



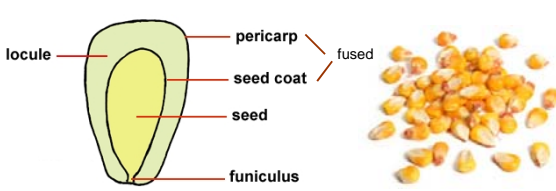
Indehiscent, Dry Fruits - *Achene*

Achene - single seeded, thin pericarp, seed coat is separate from ovary wall. Example: sunflower and strawberry "seeds"



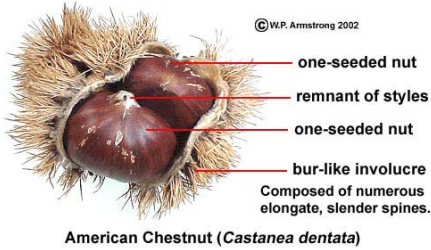
Indehiscent, Dry Fruits - *Grain*

Grain (caryopsis) - single seeded, pericarp fused with the ovary wall. Example: corn, wheat, rice, oats, etc.



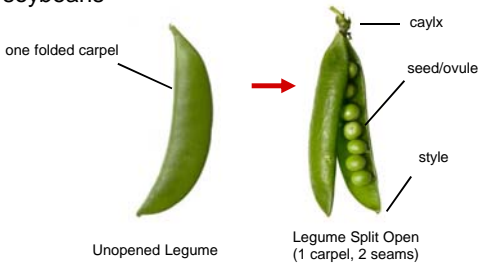
Indehiscent, Dry Fruits - *Nut*

Nut - single seeded, with hard or bony pericarp, often wholly or partially surrounded by a husk of bracts. Example: hazelnut, walnut, pecan



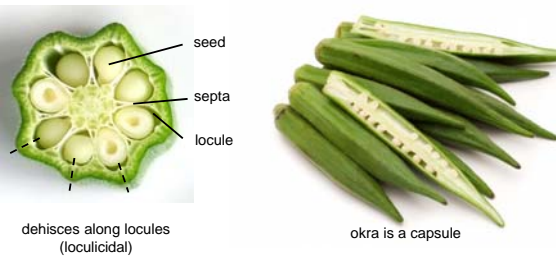
Dehiscent, Dry Fruits - *Legumes*

Legume - usually dehisces along two sutures; from a simple pistil. Example: beans, peas, soybeans



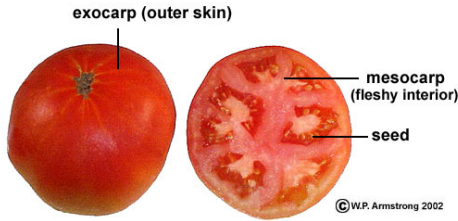
Dehiscent, Dry Fruits - *Capsule*

Capsule - usually from a compound pistil, usually many seeded. Pericarp opens with pores or slits. Example: okra (which we eat before maturity.)



Fleshy Fruits - Berry

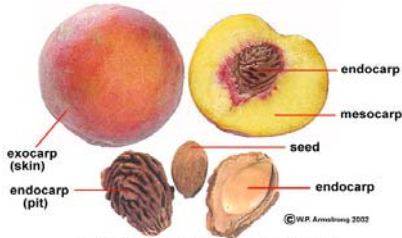
Berry - one to multiple seeds, mesocarp is fleshy, endocarp is soft. Example: grape, tomato



Berry (All of most of pericarp is fleshy)
e.g. tomato (*Lycopersicon esculentum*)

Fleshy Fruits - Drupe

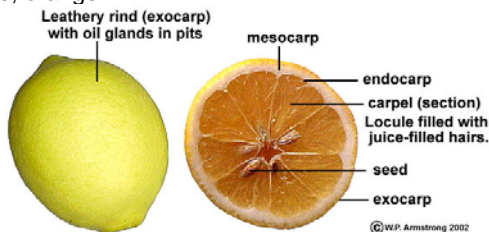
Drupe - usually one seeded, exocarp a thin skin, mesocarp fleshy, endocarp usually hard. Example: peach, plum



Drupe (fleshy fruit with a stony endocarp)

Fleshy Fruits - Hesperidium

Hesperidium - special kind of berry with leathery rind and oil glands dotting the surface. Example: lime, orange



Hesperidium (berry with a leathery rind)
e.g. lemon (*Citrus lemon*)

Fleshy Fruits - *Pepo*

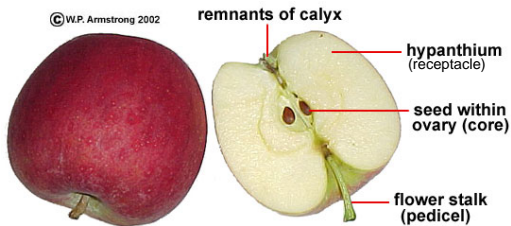
Pepo fruits are berrylike, with a hard rind; almost always with three carpels and parietal placentation. Examples: melon, squash



Pepo (a berry with a hard, thick rind)
e.g. watermelon (*Citrullus lanatus* var. *lanatus*)

Fleshy Fruits - *Pome*

Pome fruits have most of the flesh derived from a floral cup and receptacle. Example: Apple, pear



Pome (ovary surrounded by fleshy hypanthium)
e.g. apple (*Malus domestica* cv. 'gala')

Non-Simple Fruits - *Accessory*

Accessory fruits are those where the "fruit" part is derived from something other than ovary tissue. A strawberry is a swollen receptacle and the seeds on the surface are the true fruits, called achenes.



Aggregate Fruit
Many one-seeded achenes produced by a single flower.
Hybrid Strawberry (*Fragaria ananassa*)

Aggregate Fruit



Develops from several to many separate pistils in a single flower

Multiple Fruit



Develops from the fused ovaries of multiple flowers in an inflorescence

Inflorescences

An inflorescence is a group or cluster of flowers. It may be branched or unbranched. Modifications can involve the length, variations in the proportions, compressions, and swellings, and the order in which the flowers open.

Usually the modifications have been evolved to optimize the plant's method of pollen dispersal.

Inflorescences



There are many different kinds, some of which are closely associated with particular families.

Solitary



Flowers one per stem

Spike



Floral axis unbranched

Flowers have no stalk and sit right on the axis.

Spikelet



Like a spike, but flowers are unisexual

Usually found in the grass family--Poaceae

Spikelets are themselves arranged in any of a number of ways

Raceme



Axis unbranched, individual flowers have stalks.

Umbel



All flower stalks arise at the same point at the top of the stem

Panicle



Main axis is branched, sometimes several times

Head or Capitulum



All flowers crowded in a common receptacle that looks like one flower.

Quiz Time!




Hall of Shame

Johnson grass *Sorghum halepense*



- Warm-season grass
- Broad leaves
- Reddish flowers
- Thick rhizomes
- Native to Mediterranean
- Introduced for forage and erosion control
- Weedy on every continent except Antarctica



- Can cause poisoning or bloat in grazing animals
- Tilling just makes it mad
- Can be somewhat controlled by frequent close mowing
- Herbicide-resistant strains have arisen
- Can interbreed with grain sorghum
- One of the world's ten worst weeds

Giant Reed *Arundo donax*



Very large, thick-stemmed grass with plummy flower heads

Can grow to 20 feet tall

Found in roadside ditches and wet areas

Spreads by rhizomes and is largely sterile

Native to Asia, possibly Africa, Arabia



Cultivated for thousands of years

Egyptians wrapped mummies in it

Useful for building, reeds for musical instruments

Multiple introductions to the U.S., as long ago as Spanish missionaries

Some potential for use as biofuel, but extremely hard to get rid of and displaces native vegetation

On Texas Noxious Weed List

Bothriochloa ischaemum King Ranch Bluestem



5391936

Photo: John Randall



Photo by Petr Filippov


Knee-high, warm season grass
 Pinkish flowers, rather showy along roadsides
 Native to Africa and Europe
 Introduced in 1920s and 1930s for forage and erosion control
 Associated in Texas with the King Ranch
 Now they'd like to get rid of it
 Can be somewhat controlled by **summer** burning and tilling 2" or less in summer (any deeper brings up more seed)

Bermudagrass *Cynodon dactylon*



Photo by Manojk

Native to Africa, Asia, Southern Europe
 Arrived in the U.S. from Bermuda?
 Grown extensively as a warm-season turfgrass and pasture grass
 Well-adapted to sun, drought, wear



Seed heads have 2 to 6 fingers
 Narrow leaf blades on most varieties
 Reproduces by seed, by rhizomes, and by stolons, rooting wherever a stem touches the ground
 Roots may reach 2 meters in depth
 Extremely difficult to eradicate

Bamboo *Phyllostachys aurea*



Large, cane-like grasses to several meters tall

Stems typically gold, but may be green in full shade

Nodes are crowded at base of stem

Spread aggressively by rhizomes

Many types flower only infrequently

Different cultivars exist



Native to China

Cultivated for ornament

Hardy to -10 F

Mow, dig, glyphosate, buried barriers

Other bamboos will also "run," but not all cultivated bamboos will spread. Some are well-behaved clump-formers

Plant something else!

Sapium sebiferum/ Triadica sebifera Chinese Tallow Tree



Photo: Kenpei

Rough-barked tree

Leaves are rhomboid or slightly heart-shaped

Fruit on females: black capsules, each with 3 white seeds

Brilliant red or maroon fall color

Prefers wet areas




Native to China, Taiwan, Japan

Oily seeds used in soap and candles, great biodiesel crop

Can form up to 23% of tree cover; fruit inedible = "desert"

Listed by TX Department of Agriculture as one of the 24 most invasive plants

Included on the list of Noxious and Invasive Plants which are illegal to sell, distribute or import into Texas.

Cut and apply herbicide, gather fruit

Photo by Zhangzhugang

Chinaberry *Melia azedarach*



Weak-wooded deciduous tree

Twigs have prominent lenticels



Twice-pinnately compound leaves

Fragrant purple flowers

Yellow, marble-sized fruit with hard seeds

Birds like the fruit!

Photo: Alpsdake

Native to India, Pakistan, SE Asia, Australia

Cultivated for ornament

Introduced to U.S. ca. 1830


Seeds toxic to humans but have been used like beads

Wood has some uses

Cut and apply herbicide--very readily resprouts!

Photo: Forest and Kim Starr

Privet *Ligustrum* spp.



Shrubs with opposite leaves
Flowers in panicles, white, four fused petals
Fruit a blue or blue-black, one-seeded drupe

Photo: Bidgee




Photo: John Tann

L. sinense, leaves ovate

These two with small leaves, may be deciduous in harsh winters

L. quihoui, leaves tapered to both ends

© Wilbur Duncan




Photo: Adam Warrington

L. lucidum, leaves folded along midrib

These two larger plants, leaves thick and leathery

L. japonicum, Leaves flatter, less pointed, smaller



Ligustrum being parasitized by *Cuscuta japonica*, another horrible invasive plant!

Nine species currently found in the U.S. None are native, all are invasive

Introduced for ornament, beginning in 1730

Widely used in landscaping

Birds distribute the fruit

Extremely competitive with native understory such as yaupon and farkleberry

Cut and apply herbicide

Plant something else!!!



Japanese Honeysuckle *Lonciera japonica*

Vine with opposite, oval leaves

Young leaves may be toothed

Bark peels off in shreds

Climbs to great heights by twining

Flowers have 4 fused petals and are 2-lipped

Blooms start white and age yellow

Fruit is a blue-black drupe



Native to China, Japan, and Korea

Cultivated for ornament--there are several cultivar names

Extremely aggressive and difficult to eradicate, especially in woods

Bird-dispersed but also spreads via rhizomes

Cutting and applying herbicide is most effective

On Texas' Noxious Weed List



Sow-thistle *Sonchus* spp.



Photo: Alvesgaspar

Two annual species, *S. asper* and *S. oleraceus*

Toothed, prickly leaves

Milky sap

Similar to dandelion (*Taraxacum*), but have well-developed stems and branched inflorescences

Seeds with parachutes allow wide dispersal



Native to Europe and Asia, widespread as weeds

May have reached the U.S. as a contaminant in seed or as a vegetable crop

Edible by livestock and humans

Regular close mowing prevents seed set; herbicide may be ineffective

Be on watch for *S. arvensis*, which is perennial

Bastardcabbage *Rapistrum rugosum*




Annual herb to 1 m tall

Deeply lobed leaves

Yellow, 4-petaled flowers

Fruit with 1 seed in upper part and a sterile lower part

Flowers spring and winter



Native to Eurasia and N Africa

Introduced as seed contaminant?

Uncommon in Texas in the 1970s


Now widespread on roadsides, creeping into natural areas

Can flower twice yearly, can develop herbicide resistance

Hand pull or mow

Photo: G. Runzel-Rapsotter

Branched Broomrape *Orobanche ramosa*



Orobanche multiflora

Small herb with scale-like leaves and no chlorophyll

Parasitic on a number of native and crop plants

Grows from a bulb-like structure which holds food reserves

Two-lipped purple or light yellow flowers

Seeds are as fine as dust, will cling to mowing equipment, shoes, animals, etc. and remain viable in the soil for decades

BOTN 001 - Kelley Cassell
Brazos County Texas - hwy. 30



Native to Eurasia and North Africa

Major pest worldwide

Yellow-flowered form in Karnes Co. since 1970s

Purple-flowered form introduced near Huntsville in 1997, now from Dallas to Victoria

Glyphosate is effective in Australia, but in TX, by the time flowers are produced, plant has enough reserves to set seed even if host is killed

Clean mowing equipment, sow false host (flax)

Nuke from orbit

On Texas Noxious Weed List, Federal Noxious Weed

Photo: Valter Jacinto

Giant Water Spangles *Salvinia molesta*



Photo: ixtixel

Aquatic, floating fern

Fronds are elliptic to rather rectangular, to 4 cm long

Surface hairs have branches that meet at the ends to look like eggbeaters

Capable of rapid reproduction -- can form mats 2 feet thick

Can choke waterways, deplete oxygen, block light



Native to Brazil, introduced as an aquarium plant, possibly also with fish shipments

Somewhat heat and cold tolerant, can live in tidal rivers, can withstand short periods of stranding

Naturalized in TX and LA, weedy elsewhere

Some potential to clean wastewater

Mechanical removal, limited success with herbicide, some biological control (weevil)

Federal and State Noxious Weed

Dishonorable Mention









Britton's Wild Petunia *Ruellia caerulea*



Tropical Milkweed *Asclepias curassavica*

Remember: Eternal Vigilance is Key!