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Response of *Amaranthus* spp. following exposure to sublethal herbicide rates via spray particle drift

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Abstract

OPEN ACCESS

Citation: Vieira BC, Luck JD, Amundsen KL, Gaines TA, Werle R, Kruger GR (2019) Response of Amaranthus spp. following exposure to sublethal herbicide rates via spray particle drift. PLoS ONE

The adverse consequences of herbicide drift towards sensitive crops have been extensively reported in the literature. However, little to no information is available on the consequences of herbicide drift onto weed species inhabiting boundaries of agricultural fields. Exposure to herbicide drift could be detrimental to long-term weed management as several weed species have evolved herbicide-resistance after recurrent selection with sublethal herbicide rates This study investigated the deposition of glyphosate, 2,4-D, and dicamba spray particle drift from applications with two different nozzles in a low speed wind tunnel, and their impact on growth and development of Amaranthus spp. Herbicide drift resulted in biomass reduction or complete plant mortality. Inflection points (distance to 50% biomass reduction) for Amaranthus tuberculatus were 7.7, 4.0, and 4.1 m downwind distance for glyphosate, 2.4-D, and dicamba applications with the flat-fan nozzle, respectively, whereas these values corresponded to 2.8, 2.5, and 1.9 m for applications with the air-inclusion nozzle. Inflection points for Amaranthus palmeri biomass reduction were 16.3, 10.9, and 11.5 m for glyphosate, 2,4-D, and dicamba applications with the flat-fan nozzle, respectively, whereas these values corresponded to 7.6, 5.4, and 5.4 m for applications with the air-inclusion nozzle. Plants were more sensitive to glyphosate at higher exposure rates than other herbicides, whereas plants were more sensitive to 2,4-D and dicamba at lower exposure rates compared to glyphosate. Applications with the flat-fan nozzle resulted in 32.3 and 11.5% drift of the applied rate at 1.0 and 3.0 m downwind, respectively, whereas the air-inclusion nozzle decreased the dose exposure in the same distances (11.4 and 2.7%, respectively). Herbicide drift towards field boundaries was influenced by nozzle design and exposed weeds to herbicide rates previously reported to select for herbicide-resistant biotypes.

14(7): e0220014. https://doi.org/10.1371/journal. pone.0220014

Editor: Anil Shrestha, California State University Fresno, UNITED STATES

- Received: April 30, 2019
- Accepted: July 5, 2019
- Published: July 18, 2019

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Data Availability Statement: All relevant data are within the manuscript and its Supporting information files.

Funding: The authors would like to thank CAPES (Brazilian Government Foundation) for the financial support to the graduate student BCV (proc 013041/ 2013-04). This project was partially supported by the Nebraska Agricultural Experiment Station with funding from the Hatch Multistate Research capacity funding program from the USDA National Institute of Food and Agriculture. The funders had

PLOS ONE | https://doi.org/10.1371/journal.pone.0220014 July 18, 2019

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Amaranthus spp malizia. Amaranthus spp caracteristicas. Amaranthus spp weed. Amaranthus spp leaves. Amaranthus spp common name. Amaranthus spp taxonomia. Amaranthus spp l. Amaranthus spp pdf.

This article is about the plant genus Amaranthus. For other uses, see Amaranth (disambiguation). Genus of plants "Amaranthus" and "Doodo" redirect here. For the Momoiro Clover Z album, see Amaranthus (album). For the Songhai drum (doodo), see talking drum. Amaranthus Amaranthus tricolor Scientific classification Kingdom: Plantae Clade: Tracheophytes Clade: Angiosperms Clade: Eudicots Order: Caryophyllales Family: Amaranthaceae Subfamily: Amaranthus is a cosmopolitan genus of annual or short-lived perennial plants collectively known as amaranths.[1] Some amaranth species are cultivated as leaf vegetables, pseudocereals, and ornamental plants. Most of the Amaranthus species are summer annual weeds and are commonly referred to as pigweeds.[2] Catkin-like cymes of densely packed flowers grow in summer or autumn.[3] Amaranth varies in flower, leaf, and stem color with a range of striking pigments from the spectrum of maroon to crimson and can grow longitudinally from 1 to 2.5 metres (3 to 8 feet) tall with a cylindrical, succulent, fibrous stem that is hollow with grooves and bracteoles when mature.[4] There are approximately 75 species in the genus, 10 of which are dioecious and native to North America with the remaining 65 monoecious species endemic to every continent (except Antarctica) from tropical lowlands to the Himalayas.[5] Members of this genus share many characteristics and uses with members of some species are also eaten.[6] Description Amaranth grain is collected from the genus. The leaves of some species are also eaten.[6] Description Amaranth grain (left) and wheat (right) Amaranth is a herbaceous plant or shrub

that is either annual or perennial across the genus.[4] Flowers vary interspecifically from the presence of 3 or 5 tepals and stamens, whereas a 7-porate pollen grain structure remains consistent across the family.[4] Species across the family.[4 Leaves are approximately 6.5-15 centimetres (2+1/2-6 inches) and of oval or elliptical shape that are either opposite or alternate across species, although most leaves are whole and simple with deeper spreading secondary fibrous root structures.[7] Inflorescences are in the form a large panicle that varies from terminal to axial, color, and sex. The tassel of fluorescence is either erect or bent and varies in width and length between species. Flowers are radially symmetric and either monecious (e.g. A. hybridus,) or dioecious (e.g. A. palmeri).[7] Fruits are in the form of capsules referred to as a unilocular pixdio that opens at maturity.[7] The top (operculum) of the unilocular pixdio releases the urn that contains the seed.[7] Seeds are circular form from 1 to 1.5 millimeters in diameter and range in color with a shiny, smooth seed coat.[7] The panicle is harvested 200 days after cultivation with approximately 1,000 to 3,000 seeds harvested per gram.[8] Chemistry Amaranth grain contains phytochemicals that are not defined as nutrients and may be antinutrient factors, such as polyphenols, saponins, tannins, and oxalates. These compounds are reduced in content and antinutrient effect by cooking.[9][10] Taxonomy Amaranthus shows a wide variety of morphological diversity among and even within certain species. Amaranthus is part of the Amaranthaceae that is part of the Amaranthaceae that is part of the larger grouping of the Carophyllales.[4] Although the family (Amaranthaceae) is distinctive, the genus has few distinguishing characters among the 75 species present across six continents [11] This complicates taxonomy and Amaranthus has generally been considered among systematists as a "difficult" genus and hybridize often. [12] In 1955, Sauer classified the genus into two subgenera, differentiating only between monoecious and dioecious species: Acnida (L.) Aellen ex K.R. Robertson and Amaranthus. [12] Although this classification was widely accepted, further infrageneric classification was (and still is) needed to differentiate this widely diverse group. Mosyakin and Robertson 1996 later divided into three subgenera: Acnida, Amaranthus, and Albersia.[13] The support for the addition of the subdivision Albersia because of its circumcise,[clarify] indehiscent fruits coupled with three elliptic to linear tepals to be exclusive characters, reproductive strategies, geographic distribution, and molecular evidence.[11][14][15] The phylogenies of Amaranthus using maximum parsimony and Bayesian analysis of nuclear and chloroplast genes suggest five clades within the genus: Diecious / Pumilus, Hybris, Galapagos, Eurasian/ South African, Australian (ESA), ESA + South American.[14] Amaranthus includes three recognised subgenera and 75 species, although species numbers are questionable due to hybridisation and species concepts [4] Infrageneric classification focuses on inflorescence, flower characters and whether a species is monoecious/dioecious, as in the Sauer (1955) suggested classification of Amaranth. Wild species have longer bracteoles compared to cultivated species.[12] A modified infrageneric classification of Amaranthus includes three subgenera: Acnida, Amaranthus, and Albersia, with the taxonomy further differentiated by sections within each of the subgenera. [16] There is near certainty that A. hypochondriacus is the common ancestor to the cultivated grain species, however the later series of domestication to follow remains unclear. There has been opposing hypotheses of a single as opposed to multiple domestication events of the three grain species.[11][17] There is evidence of phylogenetic and geographical support for clear groupings that indicate separate domestication events in South America.[11] A. hybridus may derive from South America, whereas A. caudatus, A. hypochondriacus, and A. quentiensis are native to Central and North America.[11][17] Species Main article: List of Amaranthus acanthochiton - greenstripe Amaranthus acanthochiton Amaranthus and erssonii Amaranthus arenicola - sandhill amaranth Amaranthus blitum - purple amaranth Amaranthus blitoides - mat amaranth amaranth, California pigweed Amaranthus cannabinus - tidal-marsh amaranth Amaranthus crassipes - spreading amaranth Amaranthus crispus - crispleaf amaranth Amaranthus cruentus - purple amaranth, red amaranth, Mexican grain amaranth Amaranthus deflexus - Iarge-fruit amaranthus furcatus Amaranthus furcatus Amaranthus furcatus Amaranthus graecizans Amaranthus graecizans Amaranthus graegii - Gregg's amaranth Amaranthus hybridus - smooth amaranth, smooth pigweed, red amaranthus minimus Amaranthus mitchellii Amaranthus minimus Amar palmeri - Palmer's amaranth, Palmer pigweed, careless weed Amaranthus powellii - green amaranth Amaranthus pringlei - Pringle's amaranth Amaranthus pringlei - Pringle's amaranth, Powell amaranthus pringlei - Pringle's amaranth Amaranthus pringlei - Pringle's amaranthus pringle's amaranth amaranth, redroot pigweed, common amaranth Amaranthus saradhiana Amaranthus scleranthoides - variously Amaranthus sclerantoides Amaranthus scleranthis scleranth torrey's amaranth Amaranthus tricolor - Joseph's-coat Amaranthus tuberculatus - rough-fruit amaranth, tall waterhemp Amaranthus wrightii - Wright's amaranth Amaranthus tricolor - Joseph's-coat Amaranthus tuberculatus - rough-fruit amaranth, tall waterhemp Amaranthus wrightii - Wright's amaranth Etymology "Amaranthus tricolor - Joseph's-coat Amaranthus tuberculatus - rough-fruit amaranth, tall waterhemp Amaranthus wrightii - Wright's amaranth Etymology "Amaranthus tricolor - Joseph's-coat Amaranthus tuberculatus - rough-fruit amaranth, tall waterhemp Amaranthus wright's amaranth Etymology "Amaranthus tuberculatus - rough-fruit amaranth, tall waterhemp Amaranthus wright's amaranth Etymology "Amaranthus tuberculatus - rough-fruit amaranth, tall waterhemp Amaranthus wright's amaranthus wright's amaranthus wright's amaranthus tuberculatus - rough-fruit amaranthus wright's amara "unfading", with the Greek word for "flower", άνθος (anthos), factoring into the word's development as amaranth, the unfading flower. Amaranthus and Celosia share long-lasting dried flowers), as Amaranthus plants were not yet known in Europe.[23] Ecology Amaranth weed species have an extended period of germination, rapid growth, and high rates of seed production, [2] and have been causing problems for farmers since the mid-1990s. This is partially due to the reduction in tillage, often.[24] The following 9 species of Amaranthus are considered invasive and noxious weeds in the U.S and Canada: A. albus, A. blitoides, A. hybridus, A. palmeri, A. powellii, A. retroflexus, A. blitoides, A. hybridus, A. blitoides, A. hybridus, A. palmeri, A. powellii, A. retroflexus, A. blitoides, A. hybridus, A. blitoides, A. hybridus, A. palmeri, A. powellii, A. retroflexus, A. blitoides, A. hybridus, A. blitoides, A. hybridus, A. blitoides, A. hybridus, A. palmeri, A. powellii, A. retroflexus, A. blitoides, A. hybridus, A. blitoides, A. hybridus, A. powellii, A. retroflexus, A. blitoides, A. hybridus, A. blitoides, A. hybridus, A. powellii, A. retroflexus, A. blitoides, A. hybridus, A. blitoides, A. hybridus, A. powellii, A. retroflexus, A. blitoides, A. hybridus, A. hybridus, A. hybridus, A. hybridus, A. hybridus, A. hybri by herbicides using the chemical. Also, this plant can survive in tough conditions. The species Amaranthus palmeri (Palmer amaranth) causes the greatest reduction in soybean yields by 17-68% in field experiments.[2] Palmer amaranth is among the "top five most troublesome weeds" in the southeast of the United States and has already evolved resistances to dinitroaniline herbicides and acetolactate synthase inhibitors.[27] This makes the proper identification of Amaranthus species at the seedling stage essential for agriculturalists. Proper weed control needs to be applied before the species successfully colonizes in the crop field and causes significant yield reductions. An evolutionary lineage of around 90 species within the genus has acquired the C4 carbon fixation pathway, which increases their photosynthetic efficiency. This probably occurred in the Miocene. [28][29] Uses This section needs additional citations for verification. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed. Find sources: "Amaranth" - news · newspapers · books · scholar · JSTOR (April 2019) (Learn how and when to removed before consumption. [30] Amaranth being roasted in a comal Amaranth muesli mix Skull shapes made of amaranth and honey for Day of the Dead in Mexico Alegría, traditional Mexican candy made with amaranth grain, uncookedNutritional value per 100 g (3.5 oz)Energy1,554 kJ (371 kcal)Carbohydrates65.25 gStarch57.27 gSugars1.69 gDietary fiber6.7 g Fat7.02 gSaturated1.459 gMonounsaturated1.685 gPolyunsaturated2.778 g Protein13.56 gTryptophan0.181 gThreonine0.526 gLeucine0.879 gLysine0.747 gMethionine0.226 gCystine0.191 gPhenylalanine0.582 gLeucine0.879 gLysine0.747 gMethionine0.289 gLysine0.747 gMethionine0.289 gLysine0.747 gMethionine0.289 gLysine0.747 gMethionine0.289 gLysine0.747 gMethionine0.280 gLysine0.747 gMethionine0.289 gLysine0.747 gMethionine0.280 gMethionine0.280 gMethionine0.280 gMethionine0.280 gMethionine0.280 gMethionine0.280 gMethionine0.280 gMet gGlycine1.636 gProline0.698 gSerine1.148 g VitaminsQuantity %DV†Thiamine (B1)10% 0.116 mgRiboflavin (B2)17% 0.2 mgVitamin E645% 0.591 mgFolate (B9)21% 82 µgVitamin C5% 4.2 mgVitamin E8% 1.19 mg MineralsQuantity %DV†Calcium16% 159 mgIron59% 7.61 mgMagnesium70% 248 mgManganese159% 3.333 mgPhosphorus80% 557 mgPotassium11% 508 mgSodium0% 4 mgZinc30% 2.87 mg Other constituentsQuantityWater11.3 gSelenium18.7 µg Full Link to USDA Database entry Units µg = micrograms • mg = milligrams IU = International units †Percentages are roughly approximated using US recommendations for adults. Source: USDA FoodData Central Uncooked amaranth grain by weight is 12% water, 65% carbohydrates (including 7% dietary fiber), 14% protein, and 7% fat (table). A 100-gram (3+1/2-ounce) reference serving of uncooked amaranth grain provides 1,550 kilojoules (371 kilocalories) of food energy, and is a rich source (20% or more of the Daily Value, DV) of protein, dietary fiber, pantothenic acid, vitamin B6, folate, and several dietary minerals (table). Uncooked amaranth is particularly rich in manganese (159% DV), and selenium (34% DV), and selenium (34% DV). nutrients, with only dietary minerals remaining at moderate levels.[31] Cooked amaranth leaves are a rich source of vitamin A, vitamin C, calcium, and manganese, with moderate levels of folate, iron, magnesium, [32] Amaranth does not contain gluten.[33][34][35] History The native range of the genus is cosmopolitan.[8] In pre-Hispanic times, amaranth was cultivated by the Aztecs as huauntity very similar to maize.[36] Known to the Aztecs as huauntity very similar to maize.[37] amaranth is thought to have represented up to 80% of their energy consumption before the Spanish conquest. drinks and foods. To this day, amaranth grains are toasted much like popcorn and mixed with honey, molasses, or chocolate to make a treat called alegría, meaning "joy" in Spanish. While all species are believed to be native to the New World, several have been cultivated and introduced to warm regions worldwide. distribution makes it one of many plants providing evidence of pre-Columbian oceanic contact.[38][39] The earliest archeological evidence for amaranth in the Old World was found in an excavation in Narhan, India, dated to 1000-800 BCE.[40][dubious - discuss] Because of its importance as a symbol of indigenous culture, its palatability, ease of cooking, and a protein that is particularly well-suited to human nutritional needs, interest in amaranth seeds (especially A. cruentus and A. hypochondriacus) revived in the 1970s. It was recovered in Mexico, sometimes mixed with chocolate or puffed rice, and its use has spread to Europe and other parts of North America. Seed Several species are raised for amaranth "grain" in Asia and the Americas. Amaranth and its relative quinoa are considered pseudocereals because of their similarities to cereals in flavor and cooking. The spread of Amaranthus is of a joint effort of human expansion, adaptation, and fertilization strategies. Grain amaranth has been used for food by humans in several ways. The grain can be ground into a flour for use like other grain flours. It can be popped like popcorn, or flaked like oatmeal.[42] Seeds of Amaranth grain have been found in Antofagasta de la Sierra Department, Catamarca, Argentina in the southern Puna desert of the north of Argentina dating from 4,500 years ago, with evidence suggesting earlier use.[7] Archeological evidence of seeds from A. hypochondriacus and A. crutenus[verification needed] found in a cave in Tehuacán, Mexico, suggests amaranth was part of Aztec civilization in the 1400s.[43] Ancient amaranth grains still used include the three species Amaranthus caudatus, A. cruentus, and A. hypochondriacus.[44] Evidence from single-nucleotide polymorphisms and chromosome structure supports A. hypochondriacus.[45] It has been proposed as an inexpensive native crop that could be cultivated by indigenous people in rural areas for several reasons: A small amount of seed plants a large area (seeding rate 1 kg/ha). Yields are high compared to the seeding rate: 1,000 kg or more per hectare. It is easily harvested and easily processed, post harvest, as there are no hulls to remove. Its seeds are a source of protein.[8][46] It has rich content of the dietary minerals, calcium magnesium, phosphorus, and potassium.[47] In cooked and edible forms, amaranth retains adequate content of several dietary minerals.[47] It is easy to cook. Boil in water with twice the amount of water as grain by volume (or 2.4 times as much water by weight). Amaranth seed can also be popped one tablespoon at a time in a hot pan without oil shaken every few seconds to avoid burning.[48] It grows fast and, in three cultivated species, the large seedheads can weigh up to 1 kg and contain a half-million small seeds.[8] In the United States, the amaranth crop is mostly used for seed production. Most amaranth in American food products starts as a ground flour, blended with wheat or other flours to create cereals, crackers, cookies, bread or other baked products. Despite utilization studies showing that amaranth can be blended with other flours at levels above 50% without affecting functional properties or taste, most commercial products use amaranth only as a minor portion of their ingredients despite them being marketed as "amaranth" products.[49] Leaves, roots, and stems Southern Kerala-style traditional Thoran made with Cheera (amaranth) leaves Amaranth species of Amaranthus are documented as cultivated vegetables in eastern Asia: Amaranthus cruentus, Amaranthus blitum, Amaranthus dubius, and Amaranthus tricolor.[50] In Indonesia and Malaysia, leaf amaranth is called bayam (although the word has since been loaned to refer to spinach, in a different genus[51]). In the Philippines, the Ilocano word for the plant is kalunay; the Tagalog word for the plant is kalunay; the Tagalog word for the plant is kalunay. is called chaulai and is a popular red leafy vegetable (referred to in the class of vegetable preparations called harive soppu (]]]]. It is called harive soppu (]]]]. It is used to prepare curries such as hulee, palya, majjigay-hulee, and so on In Kerala, it is called cheera and is consumed by stir-frying the leaves with spices and red chili peppers to make a dish called keerai masial. In the states of Andhra Pradesh and Telangana and other Telugu speaking regions of the country, this leaf is called as "Thotakura" and is available in preparation of a popular dal called thotakura pappu in (Telugu). In Maharashtra, it is called shravani maath and is available in both red and white colour. In Orissa, it is called khada saga, it is used to prepare saga bhaja, in which the leaf is fried with chili and onions. In China, the leaves and stems are used as a stir-fry vegetable, or in soups. In Vietnam, it is called rau den and is used to make soup. Two species are popular as edible vegetable, or in soups. In Vietnam, it is called rau den and is used to make soup. tricolor) and den com or den trang (Amaranthus viridis). A traditional food plant in Africa, amaranth has the potential to improve nutrition, boost food security, foster rural development and support sustainable land care.[52] In Bantu regions of Uganda and western Kenya, it is known as doodo or litoto.[53] It is also known among the Kalenjin as a drought crop (chepkerta). In Lingala (spoken in the Congo), it is known as lengalenga or bitekuteku.[54] In Nigeria, it is a common vegetable and goes with all Nigeria, it is a common vegetable and set all Nigeria, it is a common vegetable and goes with all Nigeria, it is a common vegetable and goes with all Nigeria, it is a common vegetable and goes with all Nigeria, it is a common vegetable and goes with all Nigeria, it is a com Caribbean, the leaves are called bhaji in Trinidad and callaloo in Jamaica, and are sautéed with onions, garlic, and tomatoes, or sometimes used in a soup called βλήτα, vlita or vleeta. It is boiled, then served with olive oil and lemon juice like a salad, sometimes alongside fried fish. Greeks stop harvesting the plant (which also grows wild) when it starts to bloom at the end of August. In Brazil, green amaranth was, and to a degree still is, often considered an invasive species as all other species of amaranth (except the generally imported A. caudatus cultivar), though some have traditionally appreciated it as a leaf vegetable, under the names of caruru or bredo, which is consumed cooked, generally accompanying the staple food, rice and beans. Oil Making up about 5% of the total fatty acids of amaranth, squalene[55] is extracted as a vegetable-based alternative to the more expensive shark oil for use in dietary supplements and cosmetics.[56] Dyes The flowers of the 'Hopi Red Dye' amaranth were used by the Hopi (a tribe in the western United States) as the source of a deep red dye. Also a synthetic dye was named "amaranth" for its similarity in color to the natural amaranth pigments known as betalains. This synthetic dye is also known as Red No. 2 in North America and E123 in the European Union.[57] Ornamentals A. hypochondriacus (prince's feather) flowers crowded in handsome drooping spikes. Another Indian annual, A. hypochondriacus (prince's feather), has deeply veined, lance-shaped leaves, purple on the under face, and deep crimson flowers densely packed on erect spikes. Amaranths are recorded as food plants for some Lepidoptera (butterfly and moth) species including the nutmeg moth and various case-bearer moths of the genus Coleophora: C. amaranthella, C. enchorda (feeds exclusively on Amaranthus), C. lineapulvella, and C. versurella (recorded on A. spinosus). Culture Diego Durán described the festivities for the Aztec god Huitzilopochtli. The Aztec month of Panquetzaliztli (7 December to 26 December) was dedicated to Huitzilopochtli. People decorated their homes and trees with paper flags; ritual races, processions, dances, songs, prayers, and finally human sacrifices were held. This was one of the god was made out of amaranth seeds and honey, and at the end of the month, it was cut into small pieces so everybody could eat a piece of the god. After the Spanish conquest, cultivation of amaranth was outlawed, while some of the festivities were subsumed into the Christmas celebration. Amaranth is associated with longevity and, poetically, with death and immortality.[58] Amaranth garlands were used in the mourning of Achilles.[58][59] John Milton's Paradise Lost portrays a showy amaranth in the Garden of Eden, "remov'd from Heav'n" when it blossoms because the flowers that generally do not withe and retain bright reddish tones of color, even when deceased; referred to in one species as "love-lies-bleeding." Gallery Love-lies-bleeding." Gallery Love-lies-Österreich und der Schweiz 1885 Spiny amaranth (A. spinosus) Green amaranth (A. viridis) Popping amaranth (Amaranthus sp.) Amaranth from Chilpancingo See also Ancient grains References ^ "Amaranthaceae | plant family". Encyclopædia Britannica. Retrieved 2015-06-02. ^ a b c Bensch; et al. (2003). "Interference of redroot pigweed (Amaranthus retroflexus), Palmer amaranth (A. palmeri), and common waterhemp (A. rudis) in soybean". Weed Science. 51: 37-43. doi:10.1614/0043-1745(2003)051[0037:IORPAR]2.0.CO;2. S2CID 86018188. ^ RHS A-Z encyclopedia of garden plants. Dorling Kindersley. 2008. p. 1136. ISBN 978-1405332965. ^ a b c d e f g Schmid, Rudolf; Judd Walter S.; Campbell, Christopher S.; Kellogg, Elizabeth A.; Stevens, Peter F.; Donoghue, Michael J.; Kellogg, Elizabeth A.; St Wiley. 56 (4): 1316. doi:10.2307/25065934. ISSN 0040-0262. JSTOR 25065934. ^ Steckel, Lawrence E. (April 2007). "The Dioecious Amaranthus spp.: Here to Stay". 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Wild grapes- Vitis spp. Wild mustard - Sinapis arvensis Wild Parsnip - Pastinaca sativa Yellow nutsedge - Cyperus esculentus ... Herb, Flower and Vegetable Seeds: Botanic Name: Seeds Per Gram (g) Seeds per kilogram (kg: Agati: Sesbania grandiflora: 20: 20,000: Alfalfa: Medicago sativa: 330 Briony (Bryony, spp.) aka wild hops, wild vine, wood vine, gout root, mad root, snake grape Masculine. Mars. Fire. Image Magick, Money, Protection.Often used as a substitute for the rare mandrake root in poppet magick. Money placed near briony root will increase, as long as it is left there. Hang in houses to protect against bad weather. Provides an Invasive Species Profiles List, which is an overview of all invasive species profiles included on our Web site with primary common and scientific names. The listing can be sorted by common name (alphabetically ascending or descending or Aconite, Wolfsbane: humans, cattle, goats Verticillium wilt is fungal disease affecting over 350 host plants found throughout the world. It's caused by the soil-dwelling Verticillium albo-atrum. This fungus grows into plants of necessary nutrients for proper growth and clogging plants' water transport systems. It's is most active in cooler weather but may also affect plants ... 24/11/2021 · Pigweed (Amaranthus spp.) grows in rich soil with high levels of readily available nitrogen. Photo: Red root pigweed (Amaranthus retroflexus). Credit: AnRo0002 / Wikimedia Commons. Purslane (Portulaca oleracea) prefers rich soil and is an indicator of high phosphorus. Like dandelions, purslane is edible and offers health benefits. Callery pear - Pyrus calleryana Eurasian watermilfoil - Myriophyllum spicatum Bull thistle or Nodding Thistle - Cirsium arvense Musk Thistle or Spear thistle - Cirsium arvense Musk Thistle or Nodding Thistle - Cirsium arvense Musk Thistle or Spear thistle or Spear thistle - Cirsium arvense Musk Thistle - Cirsium arvense perfoliata Multiflora Rose - Rosa multiflora Purple Loosestrife - Exotic Lythrum species, including Lythrum ... Verticillium fungi: V. dahliae, V. albo-atrum, V. longisporum, V. nubilum, V. theobromae and V. tricorpus. Many economically important plants are susceptible including cotton, tomatoes, potatoes, oilseed rape, eggplants, peppers and ornamentals, as well as others in natural ... Verticillium fungi: V. dahliae, V. albo-atrum, V. longisporum, V. nubilum, V. theobromae and V. tricorpus. Many economically important plants are susceptible including cotton, tomatoes, potatoes, oilseed rape, eggplants, peppers and ornamentals, as well as others in natural ... Provides an Invasive Species Profiles List, which is an overview of all invasive species profiles and ornamentals, as well as others in natural ... Provides an Invasive Species Profiles List, which is an overview of all invasive species profiles included on our Web site with primary common and scientific names. The listing can be sorted by common name (alphabetically ascending or descending order) and can be searched by name. If you prefer to view our profiles by species type and habitat, see our main Species Profiles page. Verticillium wilt is fungal disease affecting over 350 host plants found throughout the world. It's caused by the soil-dwelling Verticillium dahliae and Verticillium albo-atrum. This fungus grows into plant roots and stems, depriving plants of necessary nutrients for proper growth and clogging plants' water transport systems. It's is most active in cooler weather but may also affect plants ... Missouri Botanical Garden. 4344 Shaw Blvd., St. Louis, MO 63110 (314) 577-5100 hours and admission Butterfly House. Faust Park, 15193 Olive Blvd. Chesterfield, MO 63017 24/11/2021 · Pigweed (Amaranthus spp.) grows in rich soil with high levels of readily available nitrogen. Photo: Red root pigweed (Amaranthus spp.) grows in rich soil and is an indicator of high levels of readily available nitrogen. phosphorus. Like dandelions, purslane is edible and offers health benefits. Provides an Invasive Species Profiles List, which is an overview of all invasive species profiles included on our Web site with primary common and scientific names. The listing can be searched by name. If you prefer to view our profiles by species type and habitat, see our main Species Profiles page. Missouri Botanical Garden. 4344 Shaw Blvd., St. Louis, MO 63110 (314) 577-5100 hours and admission Butterfly House. Faust Park, 15193 Olive Blvd., St. Louis, MO 63110 (314) 577-5100 hours and admission Butterfly House. Faust Park, 15193 Olive Blvd., St. Louis, MO 63017 LIMA E SILVA, Luis Fellipe; SOUZA, Douglas C.; XAVIER, João B. et al. Avaliação nutricional de caruru (Amaranthus spp). Revista Agrarian. Vol 12. 45 ed; 411-417, 2019; Revisão clínica: Tatiana Zanin. Nutricionista. Formada pela Universidade Católica de Santos em 2001, com registro profissional no CRN-3 nº 15097. 01/06/2012 · Redroot pigweed - Amaranthus retroflexus Redstem filaree - Erodium cicutarium Shepherd's purse - Capsella bursa-pastoris ... Wild grapes- Vitis spp. Wild mustard - Sinapis arvensis Wild Parsnip - Pastinaca sativa Yellow nutsedge - Cyperus esculentus ... Amaranthus is a cosmopolitan genus of annual or short-lived perennial plants collectively known as amaranth. Some amaranth species are cultivated as leaf vegetables, pseudocereals, and ornamental plants. Most of the Amaranthus species are summer annual weeds and are commonly referred to as pigweeds. Catkin-like cymes of densely packed flowers grow in summer or autumn. 15/10/2021 · Flea beetles feed on a variety of plants, including weeds such as pigweed (Amaranthus spp.). Vegetable plants are especially prone to damage from flea beetles; examples include: Broccoli (Brassica oleracea var. italica) Cabbage ... 24/11/2021 · Pigweed (Amaranthus retroflexus). Credit: AnRo0002 / Wikimedia Commons. Purslane (Portulaca oleracea) prefers rich soil and is an indicator of high phosphorus. Like dandelions, purslane is edible and offers health benefits. 13/08/2022 · Scientific Name Common Name(s) Species Most Often Affected Parts Poisonous Primary Poison(s) Aconite, Wolfsbane: humans, cattle, goats Missouri Botanical Garden. 4344 Shaw Blvd., St. Louis, MO 63110 (314) 577-5100 hours and admission Butterfly House. Faust Park, 15193 Olive Blvd. Chesterfield, MO 63017 Briony (Bryony, spp.) aka wild hops, wild vine, wood vine, gout root, mad root, snake grape Masculine. Mars. Fire. Image Magick, Money placed near briony root will increase, as long as it is left there. Hang in houses to protect against bad weather. Amaryllis (Many, including: Belladonna lily, Saint Joseph lily, Cape Belladonna, Naked Lady) | Scientific Names: Amaryllis spp. | Family: Amaryllis spp. | Family: Amaryllis callery and Eurasian watermilfoil - Myriophyllum spicatum Bull thistle or Spear thistle - Cirsium vulgare Canada Thistle - Cirsium arvense Musk Thistle or Nodding Thistle - Carduus nutans Johnsongrass - Sorghum halepense Mile-a-Minute - Persicaria perfoliata Multiflora Rose - Rosa multiflora Purple Loosestrife - Exotic Lythrum species, including Lythrum ... Callery pear - Pyrus calleryana Eurasian watermilfoil -Myriophyllum spicatum Bull thistle or Spear thistle - Cirsium vulgare Canada Thistle - Cirsium arvense Musk Thistle or Nodding Thistle - Carduus nutans Johnsongrass - Sorghum halepense Mile-a-Minute - Persicaria perfoliata Multiflora Rose - Rosa multiflora Purple Loosestrife - Exotic Lythrum species, including Lythrum ...



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