Woody Species

false indigo bush

Amorpha fruticosa L.

Alternate Common Names

false indigo, bastard indigo, river locust, wild indigo, indigo bush, desert false indigo

Scientific Synonyms

Amorpha angustifolia (Pursh) Boynt., *Amorpha bushii* Rydb., *Amorpha croceolanata* P.W. Watson, *Amorpha curtissii* Rydb., *Amorpha dewinkeleri* Small, *Amorpha occidentalis* Abrams, *Amorpha tennesseensis* Shuttlw. ex Kunze, *Amorpha virgata* Small

Functional Group

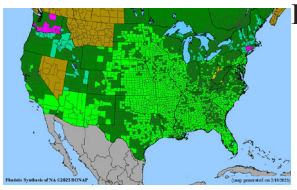
woody species, shrubs

Family

legume or pea family (Fabaceae (Leguminosae))

Description

- **Life cycle/growth form:** Fast-growing, long-lived perennial shrub, spreads by self seeding and suckering, flowers on second-year wood.
- **Height:** 3-12 ft
- **Leaves and stem:** Leaves 4-8 in long, pinnately compound with 11-25 oblong leaflets, alternate arrangement; multi-stemmed shrubs with smooth, gray, woody stems, forming thickets of spreading, cane-like stems that begin sparsely branching at about 3-4 ft in height.
- **Flower:** Irregular, with one slightly enlarged petal (unlike the typical legume flower), deep purple corolla 1/3 in long, with bright orange stamens that stick out prominently; flowers tightly packed in spikelike racemes 3-6 in long (each looking like a tapered bottle brush).
- **Fruit/seed head:** ¼ in long, tough, leathery seed pods with prominent oil glands, each pod with one seed (sometimes two).
- **Pollination:** Insects, primarily bees.



Habitat and Range

Moist soil; partial to full sun; along river and stream banks, islands, ditches, wet prairies, and seeps. Wetland Indicator Status is Facultative Wetland (FACW) for the Midwest. Plants survive for many years in mesic soils without irrigation, but seed yield (and possibly viability) increases with irrigation.

Conservation Status

Global- G5, secure; Wyoming- S2, imperiled; West Virginia- S2/S3, imperiled to vulnerable (NatureServe); Listed as a noxious weed or invasive plant in Maine, Rhode Island, New Jersey, New Hampshire, Oregon, and Washington.

General Comments

The dark purple flower spikes with brilliant orange pollen-bearing stamens attract numerous species of native bees in great abundance, along with skippers, other butterflies, and moths. The foliage and pods, when crushed, have an unusual scent, reminiscent of cumin, citrus, and creosote. Aromatic compounds from this species have been investigated as medicines, natural insecticides and insect repellents. The foliage is eaten by larvae of silver-spotted skipper and southern dogface butterflies, larvae of amorpha borer beetles live within the stems and roots, and tiny bruchid beetles feed on the seeds. The long, weakly branched stems have been used in arrow-making and as a foundation for bedding materials by Native peoples. The functions this species provides in restoration include erosion control, streambank stabilization, wildlife cover, and windbreaks, and it shows potential for use in living snow fences.

Establishment for Seed Production (Appendix A)

Direct seeding:

We do not have experience with direct seeding this species for seed production. Widely spaced rows (6 ft or more) are recommended.

Greenhouse:

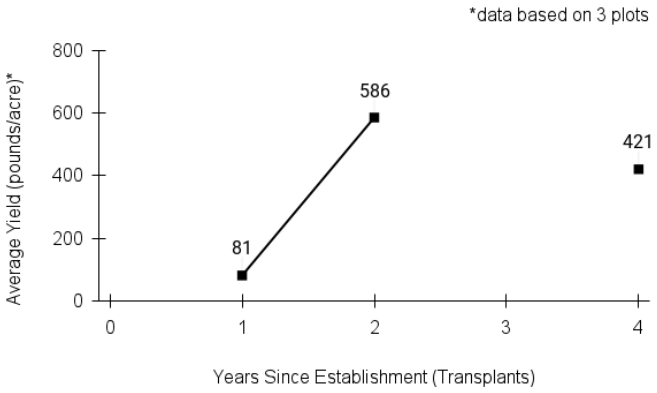
- **Seed pre-treatment:** Start seed pretreatment about 3-4 months before outplanting. Mechanical or chemical scarification is recommended as these seeds have physical dormancy, followed by 10-14 days cold/moist stratification (40°F).
- **Sowing:** Cover seed lightly (1/4 in depth) with potting mix; adding a layer of perlite or chick grit to the surface of the soil may help prevent damping off.
- **Transplanting:** Seedlings are ready for transplanting when roots have reached the bottom of the plug and are well-branched, creating a firm plug. Harden off outdoors, then transplant into plasticulture rows with drip irrigation, 2-3 plants per linear foot.

Stand Management

- **Weeds:** Plastic mulch controls weeds in year one. Shrubs grow vigorously and shade out most weeds.
- **Pests:** In very snowy winters, rabbits feed on bark and may girdle stems. Shrubs will resprout but flowering and seed set will be delayed for a year. Deer occasionally browse the tops of plants. Some native insects feed on foliage or within stems/roots, but not at densities that cause production issues. Bruchid beetles feed on developing seeds within pods and can reach significant densities. However, seed yield is still high in “good years” and when rows are irrigated.
- **Diseases:** An unidentified rust fungus causes leaves to appear distorted in some years.
- **Note:** Rows can be cut back to the ground in the dormant season if plants have become too lanky for efficient harvesting. Note that this shrub species does not flower or set seed on first year growth.

Seed Production (Appendix B)

- **First harvest:** Plants flower and set seed one year after transplanting.
- **Yield:** 80-580 pounds/acre (based on 3 plots)
- **Stand life:** More than 10 years (estimated) for these long-lived shrubs.
- **Flowering date:** June
- **Seed maturity/Harvest date:** October
- **Seed retention:** Low risk of shattering; pods remain on plants through late October.
- **Harvest date range at TPC (2018-2021):** Aug 30 - Oct 31
- **Recommended harvest method:** Strip pods from stalks by hand (wear sturdy gloves). We have not attempted to combine this species due to the woody stems. A more efficient approach might be to cut the fruiting stems onto tarps using a hedge trimmer, then run the material through a stationary combine.



Seed Cleaning Process (Appendix C)

Pass hand-collected pods through a coarse screen (1/4 to 1/2 inch hardware cloth) to remove sticks. Run through a brush machine with canvas beater bars. Seed pods have oil glands (visible under low magnification) and become very sticky when brushed. Spread oily material on a tarp and dry with a fan for a few days. Material may need to be brushed a second time after drying and before airscreening.

Seed Characteristics (Appendix D)

- **Seeds per ounce:** 3,700 (IA NRCS)
- **Seeds per pound:** 77,000 (Woody Plant Seed Manual)
- **1000 seed weight:** 7.76 g (Seed Information Database)
- **Description:** Glossy, light-brown seed resembles a small bean, 4 mm long and 1.5 mm wide, with a slightly hooked end.
- **Seed storage:** cool/dry (33-50° F, 30-50% RH) - seed retains viability for 3-5 years at room temperature (Woody Plant Seed Manual).
- **Typical seed test:**
  PLS: 90-94%
  Purity: 98%
  Germination: 31-92%
  Dormant: 0-65%
  (based on tests of one lot of commercial seed and one lot produced at the TPC)
- **Note:** Seed produced from unirrigated rows at the TPC had much lower viability (PLS: 16-23%, not included in the typical seed test above).

Released Germplasm

- **Source Identified material:** Natural Selections/Iowa Ecotype Zones 1, 2, 3
- **Selected germplasm:** Iowa Covey Germplasm, Illinois Covey Germplasm, Missouri Covey Germplasm
- **Tested germplasm:** Survivor Germplasm (ID)

References

Bonner, F. T., Karrfalt, R. P., & Nisley, R. G. (Eds.). (2008). *Woody plant seed manual.* RNGR - Reforestation, Nurseries, and Genetic Resources. https://rngr.net/publications/wpsm

Hilty, J. (2019). False indigo - *Amorpha fruticosa*. Illinois Wildflowers. https://www.illinoiswildflowers.info/trees/plants/false_indigo.htm

Kartesz, J.T., The Biota of North America Program (BONAP). 2023. North American Plant Atlas. (http://bonap.net/napa). Chapel Hill, N.C. [maps generated from Kartesz, J.T. 2023. Floristic Synthesis of North America, Version 1.0. Biota of North America Program (BONAP). (in press)]

Lady Bird Johnson Wildflower Center - The University of Texas at Austin. (2022). *Amorpha fruticosa*. Plant Database. https://www.wildflower.org/plants/result.php?id_plant=amfr

Moore, L. M. (2006). *Plant guide*: Desert false indigo - *Amorpha fruticosa L.* USDA-NRCS National Plant Data Center. https://plants.usda.gov/DocumentLibrary/plantguide/pdf/pg_amfr.pdf

NatureServe. 2024. NatureServe Network Biodiversity Location Data accessed through NatureServe Explorer [web application]. NatureServe, Arlington, Virginia. Available https://explorer.natureserve.org/. (Accessed: February 22, 2024).

Newcomb, L. (1977). Shrubs / leaves divided. In *Newcomb's wildflower guide* (pp. 106–107). Little, Brown and Company.

Runkel, S. T., & Roosa, D. M. (2009). Indigo bush. In *Wildflowers of the tallgrass prairie: The upper Midwest* (2nd ed., pp. 66–67). University of Iowa Press.

University of Georgia - Center for Invasive Species and Ecosystem Health. (n.d.). Indigobush (*Amorpha fruticosa*). EDDMapS. https://www.eddmaps.org/species/subject.cfm?sub=5086

USDA NRCS National Plant Data Team. (n.d.). *Amorpha fruticosa L.* USDA plants database. https://plants.usda.gov/home/plantProfile?symbol=AMFR

Species Updated: 12/18/2024

Notes