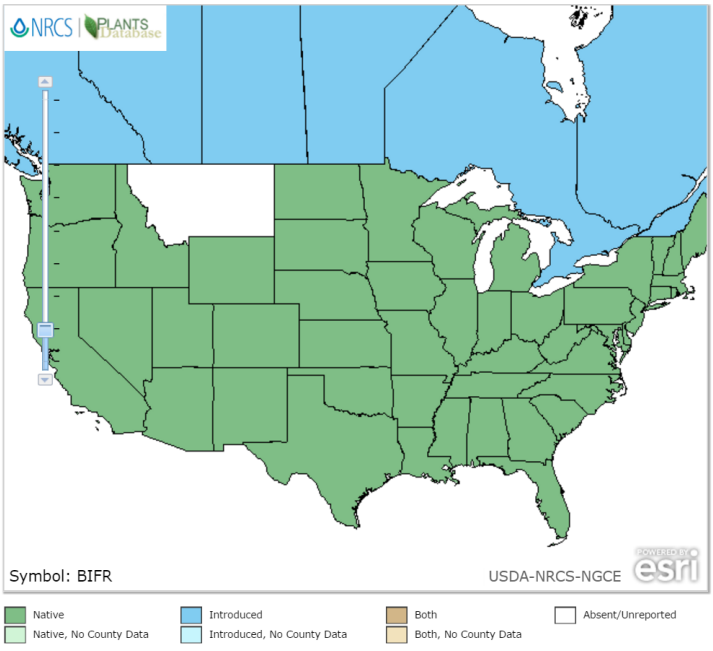
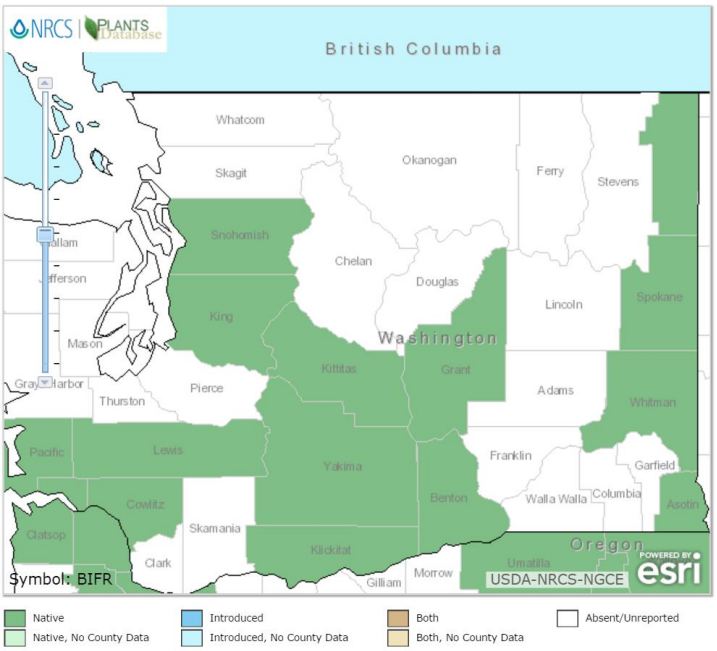
Plant Propagation Protocol for *Bidens frondosa*
ESRM 412 – Native Plant Production
Spring, 2016
Protocol URL: https://courses.washington.edu/esrm412/protocols/*BIFR.pdf*
Source: USDA PLANTS Database, 2016





TAXONOMY	
Plant Family	
Scientific Name	Asteraceae
Common Name	Sunflower Family
Species Scientific Name	
Scientific Name	*Bidens frondosa* L.
Varieties	N/A
Sub-species	N/A
Cultivar	N/A
Common Synonym(s)	*Bidens frondosa* L. var. *anomala* Porter ex Fernald *Bidens frondosa* L. var. *caudata* Sherff *Bidens frondosa* L. var. *pallida* Wiegand *Bidens frondosa* L. var. *stenodonta* Fernald & H. St. John
Common Name(s)	Devil's beggar-tick, Spanish needles, Common beggars-tick
Species Code	BIFR

GENERAL INFORMATION	
Geographical range	See maps above for distribution.
Ecological distribution	Moist, disturbed soils. Eastern deciduous forests, agricultural fields, riparian and wet meadow areas.
Climate and elevation range	Various climates across the lower 48; prefers low elevations.[3]
Local habitat and abundance	Open meadows, lakeshores, and open pockets in deciduous forests.[3]
Plant strategy type / successional stage	Early succesion from soil disturbance. Weedy colonizer that uses zoochorous seed dispersal by anchoring ooks to fur / clothing of animals that pass by.[3]
Plant characteristics	Annual herbaceous forb.
PROPAGATION DETAILS: **Reproductive biological characteristics potentially contributed to invasiveness in an alien invasive plant *Bidens frondosa*. *Plant Species Biology, 31*(2), 107-116.[5]**	
Ecotype	Open wet meadows, disturbed soils. Study conducted on wasteland soils in China
Propagation Goal	Plants
Propagation Method	Flat, achene seeds
Product Type	Seed propagules
Stock Type	
Time to Grow	Spring through summer
Target Specifications	Plants reach a maximum height of around 4 feet.
Propagule Collection Instructions	Propagules to be collected in fall through winter. Harvest dried heads then comb them to separate propagules from flower head stems.
Propagule Processing/Propagule Characteristics	195,300 seed / lb[1] High seed abundance Medium seedling vigor[1] 84% accumulated germination rate after 20 days[5] Brown, central achenes have deeper dormancy[5] Black, peripheral achenes germinate faster.[5]
Pre-Planting Propagule Treatments	Seeds should be stored in a cool, dry environment until ready for planting. Soak seeds for 24 hours before planting to ensure ample moisture.
Growing Area Preparation / Annual Practices for Perennial Crops	Soil beds for seed collection are a more economically-viable option than propagation from containers. *B. frondosa* is adapted to coarse and medium-textured soils such as compost or loamy-clay. Plants exhibit medium anaerobic tolerance. Maximum root depth: 8’’ 5.2-7.2 pH
Establishment Phase Details	Prepare a seed bed by tilling to expose soil. Sow seed at shallow depth (⅛ inches) by raking after seeds are

	broadcast seeded. Seeds
Length of Establishment Phase	less than 20 days
Active Growth Phase	Germination typically from April through June for Pacific Northwest. Temperatures >46F for germination and growth. Germination is variable since some seeds (central achenes) exhibit deeper dormancy[5] Bloom time typically in July/August (yellow flowers)[6]
Length of Active Growth Phase	Seeds mature and dry within 30 days of flowering. As temperatures fall below 46F, the plant discontinues growing and dies. Most growth is determinate, in such that the plant produces one larger crop of seeds rather than a continual flowering stage. Once seeds have dried, peripheral achenes readily germinate when soil temperatures reach above 50F. Central achenes will germinate more slowly due to its tendency for deeper dormancy. Nursery managers may observe two germination pulses due to the different achene characteristics and therefore should anticipate uneven growth stages when considering repotting tasks.
Hardening Phase	No hardening phase; annual.
Length of Hardening Phase	N/A
Harvesting, Storage and Shipping	Propagation of seedlings may not be an economically-feasible option because the plants are short-lived annuals. Therefore, the most economically-feasible option for this plant is the harvest of seed which may then be dispersed on restoration sites.
Length of Storage	Undetermined maximum length of storage before seeds lose viability.
Guidelines for Outplanting / Performance on Typical Sites	Plants are not recommended for outplanting. 1-3 ft typical, 4ft max. height.[6]
Other Comments	*B. frondosa* L. is considered to be aggressive due to its early establishment and large volume of viable seeds produced. The plant is regarded as a species of least concern. Although the plant is common, it may serve several functions in wetlands and therefore some site analysis may be needed to determine if any adverse effects of seed collection may occur. Avoid harvesting more than 10% of the seeds from a given location to ensure a stable seed bank for a site.
INFORMATION SOURCES	
References	See below
Other Sources Consulted	See below
Protocol Author	David Hagopian
Date Protocol Created or Updated	05/22/16

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