

Production of Native Seed of Known Genetic Origin at Hedgerow Farms

Pat Reynolds
Hedgerow Farms Inc.
March 16, 2021



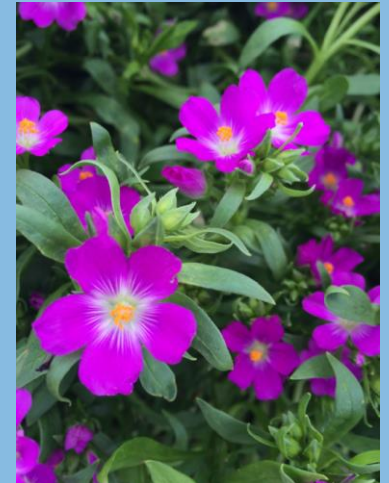


Hedgerow Farms

- Started in 1980's by John Anderson
- 350+ acres in production
- 100+ acres in restoration
- 120+ species of grasses, sedges, rushes and forbs
- Native plug nursery
- Native certified straw

Collecting Wildland Seed

- Locate sites
- Permits
- Correct species identification
- Contract seed collectors
- Seed provided for contract grows



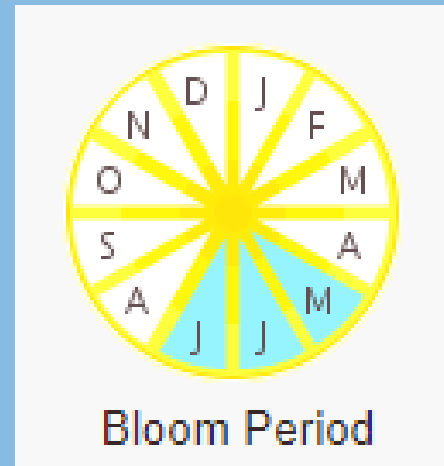
Collection Site Documentation

- Location coordinates
- Elevation
- Soils
- Associated vegetation
- Aspect and exposure
- Access/permission



Seed Collection Time Windows

- Cool season grasses
 - needle grasses, wildryes, melics, etc.
 - Spring and early summer
- Warm season grasses
 - deer grass, three awns, alkali Sacaton, salt grass
 - Late summer and fall
- Native wildflowers
 - Varies with species and locations
- Calflora lists flowering periods of native species



Field Placement

- Complicated endeavor
- Cross-contamination
 - Distance
 - Prevailing winds
 - Barriers (hedgerows)
 - Crop history
 - Time
- Grasses/forbs
- Selfing vs crossing sp.
- Cal. Crop Improve. Ass.
- Field size considerations
- Weed history



Planting Native Ecotypes

- Most species planted in fall via seed drill
- Plug planting when stock seed is limited
- Spring planting possible with wildflowers and plugs



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Weed Control



Determining Seed Maturity/ Harvest Windrows

- Many considerations
- Harvest too early seed is not viable
- Harvest too late and seed will have shattered



Harvesting Techniques

- Mechanical strippers
 - Tractor mounted strippers (Flailvac)
- Cutting whole plants or culms and allowing to dry or cure
 - Swather



Swathing and
windrowing
Festuca
(*Vulpia*)
microstachys



Combining
Elymus multisetus



Hand harvesting milkweed



Milkweed pods revealing seeds



Hand harvesting milkweed

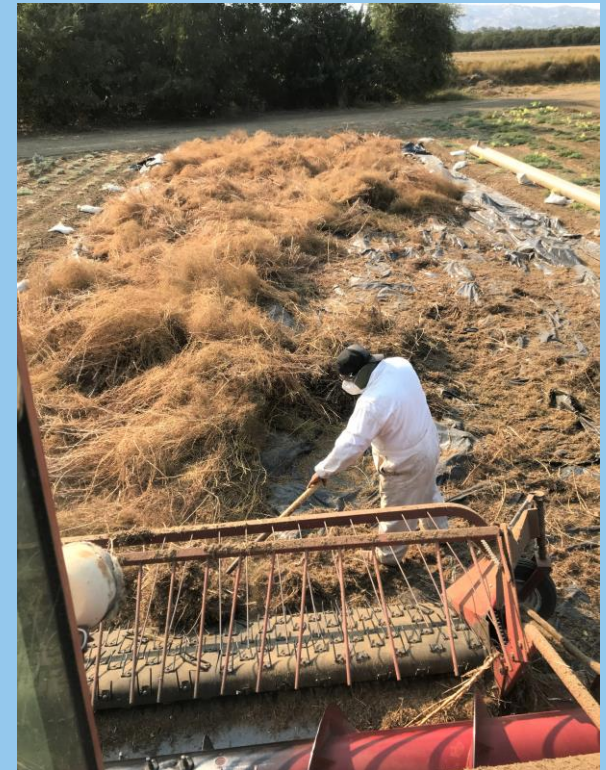


Milkweed pods revealing seeds



Sickle Bar Harvest for Tar Plants

- Resins clogged swather - sickle bar mower work around



Curing and drying




- Dried on tarps until dry (less than 10% moisture)
- If a large amount of seed, turn on a regular basis for even and rapid drying



Seed Cleaning



- Purity, Other Crop, Weed Seed, Germination

		MD Seed Analysis Inc 123 N. Salinas St. Santa Barbara, CA 93103 Laboratory Report Of Analysis			
		Account No. 57	Date Received 08/23/18	Date Completed 09/21/18	Lab Number 18-5261
Hedgerow Farms 21905 County Road 88 Winters, CA 95694		Information Provided by Sender Product VNS Kind Achillea millefolium Genus/Species Achillea millefolium Lot Number ACHMIL C9242 Common Name : Yarrow Ecotype : Marin Co.			
Purity Analysis Component in 0.4517 grams Achillea millefolium Weed seed Crop seed Inert matter		Viability Analysis Germ Date Germ Dormant Hard Viable			
Purity 78.19% 0.10% 0.01% 21.70%		09/21/18 85 -N- -N- 85			
Other Crop Seeds in 4 grams Fescue, small Vulpia microstachys		Noxious Weed Seeds in 4 grams For: All States Bedstraw, narrow-leaved Galium angustifolium		# per lb 113 Not nox in CA 3289	
Weed Seeds in 4 grams Witchgrass Panicum capillare		Other Determinations Inert matter: Plant material, dead insects. Live Seed / lb = 2,393,935 PLS = 66.46%			
# per lb 113					
Remarks Actual seeds found: 29 Bedstraw, narrow-leaved (Galium angustifolium) seeds in the noxious portion. Purity Analysis includes a Bulk Examination and Noxious Weed Seed Examination for All States. Germination Test 14 Days					
Status: Completed					
Tests Requested: Germination, Purity. No other tests requested.					
<small>WARRANTY: We warrant that the purity and germination test results reported on this form have been carried out in accordance with AOSA rules unless otherwise specified. Test results reflect the condition of the submitted sample and may not reflect the condition of the seed lot from which the sample was taken. DISCLAIMER OF WARRANTIES: WE MAKE NO OTHER WARRANTIES OF ANY KIND, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.</small>					
Signature:  Donna Grubisic, RST, seal # 24 (805) 962-0739					

Seed Testing

Seed Storage

- Insulated storage warehouse
 - Breathable packaging
 - Away from:
 - Heat
 - Moisture
 - Rodents
 - Insects
- Shelf life varies by species
 - Hard seed usually longest
 - Grasses usually 3-6 years
- Testing within 8,12,15 or months



Native Seed Species and Ecotypes Commercial Availability

- Many species and ecotypes available at Hedgerow Farms

www.hedgerowfarms.com



Sortable Database by Species

Ecotypes/origins

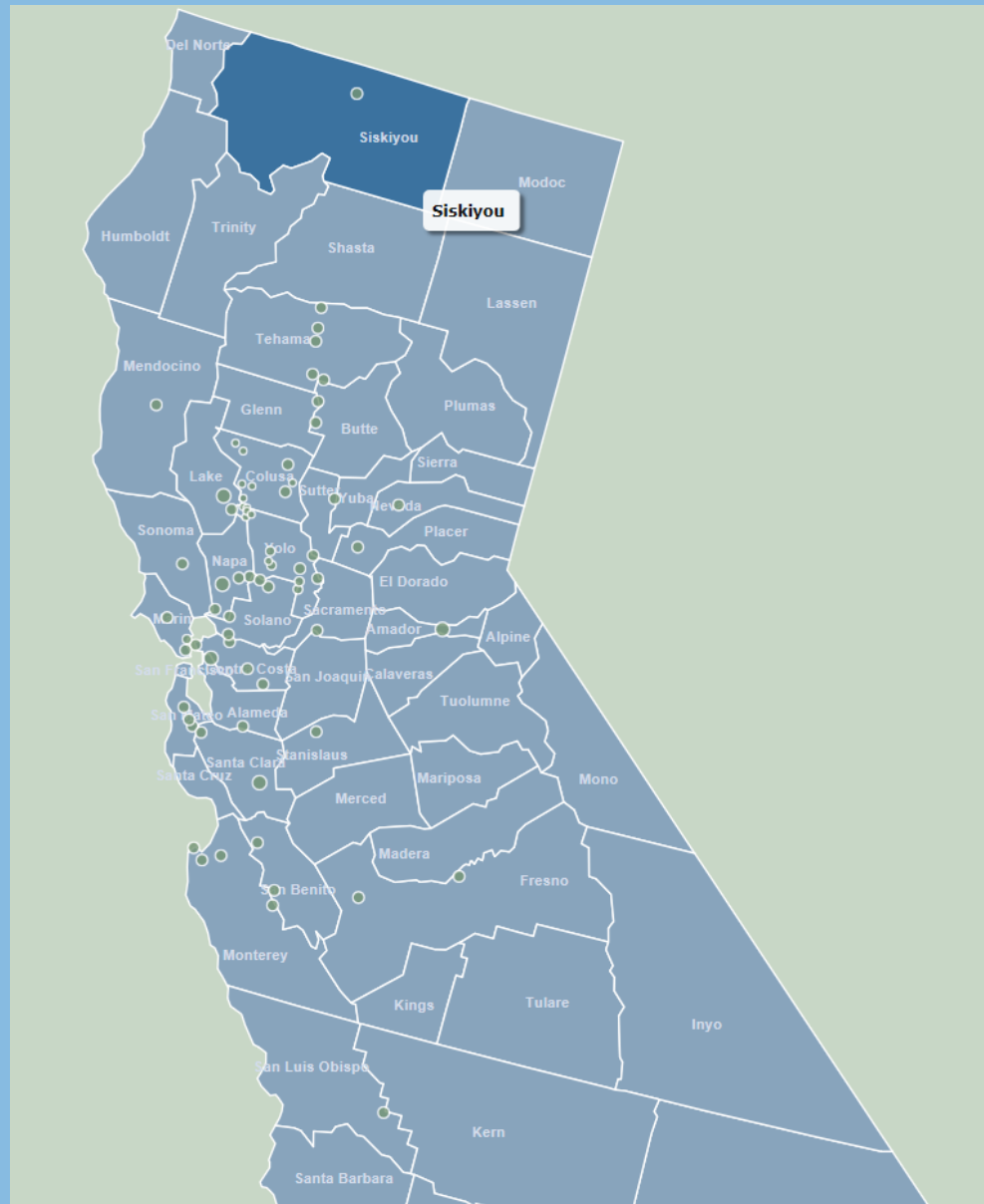
Botanical Name ↕	Common Name ↕	Ecotype/Origin ↕	General Seed Availability ↕	General Plug Availability ↕	Plant Type ↕	Life Cycle ↕
Stipa (Nassella) pulchra	purple needle grass	Butte County: Llano Seco Ranch	ask	ask	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Contra Costa County: Los Vaqueros Watershed	yes	ask	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Marin County: Bodega Bay	ask	ask	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Marin County: Nicasio	yes	ask	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Marin County: Oak Hill Park	ask	ask	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Napa County: Napa/Sonoma Marsh	yes	ask	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Sacramento County: Cosumnes River	yes	yes	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	San Benito County: Hwy 101	ask	ask	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	San Benito County: Pinnacles Nat. Park	yes	ask	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	San Mateo County: Crystal Springs Reserve	ask	ask	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Santa Clara County: Arastradero Preserve	yes	yes	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Solano County: Benicia	yes	ask	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Solano County: Jepson Prairie	ask	ask	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Tehama County: Inks Creek	yes	yes	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Nevada County: Grass Valley	ask	ask	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Tehama County: NW of Red Bluff, NRCS release	yes	ask	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Yolo County: Fiske Creek	yes	yes	Grass	perennial
Stipa (Nassella) pulchra	purple needle grass	Yolo County: Stone Ranch	yes	yes	Grass	perennial

Sortable Database by Origin

Species by County

Botanical Name	Common Name	Ecotype/Origin	General Seed Availability	General Plug Availability	Plant Type	Life Cycle
<i>Deschampsia danthonioides</i>	annual hairgrass	Yolo County: North of Winters	ask	ask	grass	annual
<i>Distichlis spicata</i>	salt grass	Yolo County: Road 102	no	yes	grass	perennial
<i>Elymus glaucus</i>	blue wildrye	Yolo County: "Anderson"	yes	yes	grass	perennial
<i>Elymus glaucus</i>	blue wildrye	Yolo County: Yolo Bypass	yes	yes	grass	perennial
<i>Elymus multisetus</i>	big squirreltail	Yolo County: Lynch Creek	ask	ask	grass	perennial
<i>Elymus trachycaulus</i>	slender wheatgrass	Yolo County: Willow Slough	yes	ask	grass	perennial
<i>Elymus (Leymus) triticoides</i>	creeping wildrye/ beardless wild rye	Yolo County: Yolo Bypass	yes	yes	grass	perennial
<i>Elymus (Leymus) triticoides</i>	creeping wildrye/ beardless wild rye	Yolo County: Yolo Bypass-Short Variety	no	ask	grass	perennial
<i>Festuca (Vulpia) microstachys</i>	small fescue/ three weeks fescue	Yolo County: Fiske Creek	yes	ask	grass	annual
<i>Hordeum brachyantherum</i>	meadow barley	Solano/Yolo County: Glide Ranch	yes	yes	grass	perennial
<i>Hordeum brachyantherum</i>	meadow barley	Yolo County: Yolo Bypass	yes	yes	grass	perennial
<i>Hordeum depressum</i>	alkali barley	Yolo County: Davis Grasslands	yes	ask	grass	annual
<i>Leersia oryzoides</i>	rice cutgrass	Yolo County: Putah Creek Watershed	no	ask	grass	perennial
<i>Melica californica</i>	California oniongrass	Yolo County: Fiske Creek	yes	yes	grass	perennial
<i>Poa secunda</i> ssp <i>secunda</i>	one sided blue grass	Yolo County: Upper Fiske Creek	yes	yes	grass	perennial
<i>Stipa (Nassella) lepida</i>	foothill needle grass	Yolo County: Stone Ranch	ask	yes	grass	perennial
<i>Stipa (Nassella) pulchra</i>	purple needle grass	Yolo County: Fiske Creek	yes	yes	grass	perennial

Ecotypes Map



Contract Growing / Seed Increases

- Stock seed tested
- Wildland stock seed provided
- Grow outs to maintain genetics
- Seed planted directly in field (best) or grown out in plugs and installed
- Planting, irrigation, fertilization, Weed control, cleaning, testing
- Minimum ½ acre best
- All seed produced is clients



Contract Growing / Seed Increases

- Frequent means of getting new species and ecotypes to market
- Can be used as a tool to mitigate impacts to special status plant species
- Hedgerow currently has more than 25 items under contract



Native Grass Straw

- Harvested from our fields
- Great for erosion control
- Noxious weed free
- Generally contains native grass seed



A vibrant landscape photograph showing a field of orange poppies in the foreground, a band of purple flowers in the middle ground, and a green field with trees in the background under a clear blue sky.

Thank you...

Questions?

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530-662-6847