

Projecting Production Costs: Are Some Species Cost Prohibitive and New Container Propagation Protocols for Lupine, Agoseris, Astragalus

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Propagation Protocol

Astragalus utahensis



- **Ecotype:** 27 sources collected from Utah and Nevada at elevations between 4060 ft. and 7400 ft.
- **Stock Type:** 7.5 cu.in. QPlug, (International Horticultural Technologies, LLC. Hollister CA. www.ihort.com)
- **Time to Grow:**
- **Propagule Collection:**
- **Propagule Processing/Propagule Characteristics:**
- **Pre-Planting Propagule Treatments:**
- **Establishment Phase:**
- **Guidelines for Outplanting / Performance on Typical Sites:**



Seed Characteristics

Astragalus utahensis

- Flowering – photoperiod dependant
- Seed Set – pollinator dependant.
- Ovules: 22-31(30)
- Seeds/ lb: 128,000
- Field longevity – 3+ years
 - 1st year no production





Wells, Nevada

2 year old plants



Nephi, Utah
1st season

Potential Seed Production for *Astragalus utahensis*

- Common Garden Production – Wells, NV. 2006
 - Non irrigated, 1.5 ft x 1.5 ft spacing, 12 biotypes
 - 30 pods/ plant (90), 4.26 seeds/pod (11)
- Native Site Production - 2 Utah Locations, 2005
 - Non-irrigated, native density – quite variable
 - 29 pods/plant (87.5%, 18.75 - 42)
 - 8.8 seeds/pod (86%, 6.6 - 11.8)

Seed Production

1 Acre 2' Rows x 1' plants

Common Garden Yield

- 30 pods X 4.26 seeds
- 22 lbs: @ \$ 40 =
\$880

Native Site Yield

- 29 pods x 8.8 seeds
- 43 lbs: @ 40 = \$1720

Native High Yield

- 42 pods x 11.8 seeds
- 84 lbs: @ 40 = \$3,360

Best Yield

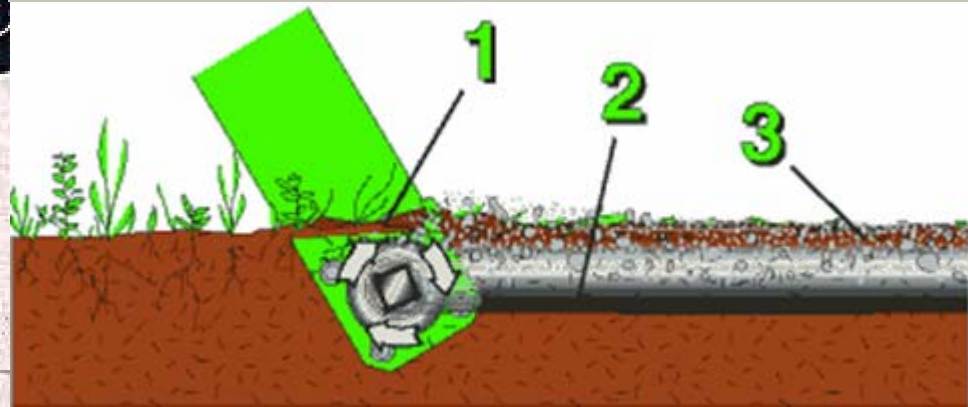
- 90 pods x 30 seeds
- 456 lbs @40 =
\$18,200

Deal Breakers

- Harvest
 - Hand harvesting – 21,632 plant / acre
 - 1lb of seed requires 250-500 plants
 - 22 hrs/lb
 - @\$12/ hr, \$260 lb for wildland collection

Potential Solutions

- Alternative A
 - Rod Weeder type Bean Harvester, Furrow and Combine





Issues:

Plant Survival Rate

Sufficient Biomass to Furrow and Collect with the Combine

Shatter



Potential Solutions

- Alternative B
 - Weed barrier, wind breaks and vacuum collector



Costs

- Alternative B
- Weed barrier - \$6,000 per acre
 - 8-12 year life expectancy, \$2,000 a cycle
 - Covered 25-40 year life
- Plugs - \$0.25 each - \$5,408 per acre
- Vacuum Harvester - \$2,000

Drawbacks:

Lots of capital at risk – Not likely to break even until year 6.

Unknown plant longevity under weed barrier.

Increased costs require increased seed yield. Selection

Propagation Protocols



- Agoseris
 - heterophylla
 - aurantiaca
 - grandiflora
 - glauca



- Traits
 - 1-3 scapes
 - Solitary heads
 - Wind dispersed
 - Self fertile
 - Will flower for several months given supplemental water



Hindrances to Commercial Production

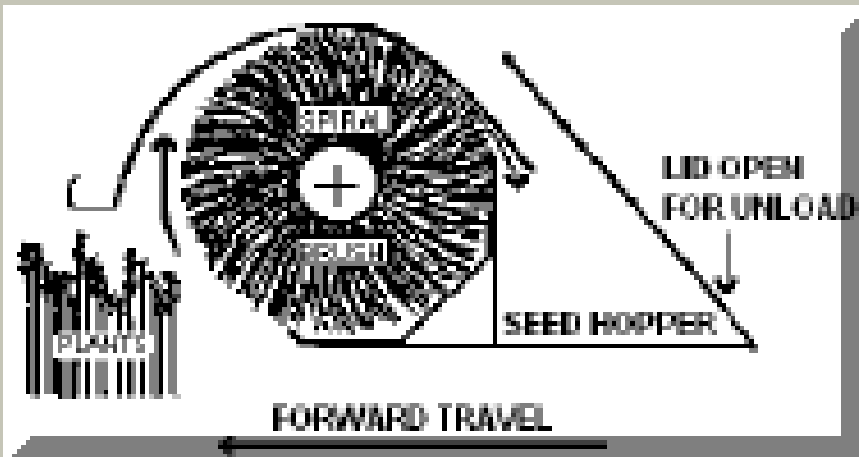
Seed Yield, Seed Weight, Seed Shatter, Harvesting Equipment

- **Harvest**
 - **Single Harvest**
 - 1 acre 1 x .5 spacing
 - 14-64 lbs
 - **Multiple harvests**
 - 3 heads per plant
 - 43-192 lbs



Potential Solutions

- Custom fabrication
 - Vacuum suction attached to a housed picker wheel.
- Flail Vac



Deal Breakers

- Neither piece of harvesting equipment is readily available – already owned.
- Requires subsurface drip irrigation system
- Under intense cultivation plants may function as annuals

Are we likely to see Agoseris seed in the commercial market

- Maybe for the grower who has:
 - Access to a flail vac
 - A good designer and welder
 - Experience with subsurface drip irrigation
 - Equipment
 - A good relationship with a local entomologist
 - A very weed free field

The Greenhouse Option



Rosemary Production Escondido, Ca.



Propagation Protocols

Lupines



arbustus, argenteus, polyphyllus,
sericeus, caudatus



Seed Characteristics

- High moisture content
 - Seed yield is 4-7% of green weight
 - Dry in shade, loose 5% weight per day





Seed Characteristics

- Shatter



Flowering Characteristics

- Uniform Seed Set
 - *Lupinus arbustus*, *polyphyllus*
 - Mechanical Harvest
- Non-uniform Seed Set
 - *Lupinus argenteus*, *caudatus*, *sericeus*
 - Hand harvest



Harvesting Machinery







The Wildland Lupine Price

- Commercial Price - \$50/lb
 - Purchase price - \$25/ lb
 - Drying, cleaning, marketing
- Wildland Collector - \$25/lb
 - Permit – \$5 - \$7 lb.
 - Collect 20-25 lbs / hr
 - Mileage

Phlox longifolia



Benson Farms





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