

FLO RATECH

New Crop Report

presents:





The image is a collage of six photographs showing the plant Machaeranthera gracilis. The photos are arranged in a 2x3 grid. The top row shows a close-up of a yellow flower on the left, a close-up of a white seed head in the center, and a close-up of a yellow flower on the right. The bottom row shows a close-up of a yellow flower on the left, a close-up of a yellow flower in the center, and a close-up of a yellow flower on the right. The background of all photos is a dry, sandy ground with sparse green foliage.

Machaeranthera gracilis

Slender Goldenweed

Taxonomy

Machaeranthera gracilis (Nutt.) Shinnars

Translated: sword-like anthers; graceful.

A.k.a.:

Dieteria gracilis

Haplopappus gracilis

Haplopappus ravenii

Sideranthus gracilis

And newly named *Xanthisma gracile*

☎ WITHIN ASTERACEAE

GEOGRAPHIC DISTRIBUTION

- ◆ Native to CA, NV, UT, AZ, CO, NM, TX, ME, NY according to USDA NRCS
- ◆ No reports of naturalizing

Climactic Conditions⁵:

Sandy or rocky places to 5000'

Habitats:

- ◆ creosote bush scrub,
- ◆ joshua tree woodland,
- ◆ east Mojave Desert



Taxonomic Description⁷

- ◆ Annual with erect stems, 3.25cm, leafy, branched at or above base, **bristly throughout**.
- ◆ Leaves: 1-3cm long, 3-7mm wide; lower oblanceolate, elliptic, or oblong in outline, 1-2 pinnately lobed; upper linear, reduced, lobes and teeth bristle-tipped.
- ◆ Inflorescence: heads radiate, solitary or in cymes; involucre 6-7mm, 7-12mm wide, hemispheric; phyllaries (bracts) in rows of 4-6, linear-lanceolate, bristle-tipped, hairy. Flowering time often from April-June.
- ◆ Ray flower: 16-18; ligules 7-12mm, yellow.
- ◆ Disk flower: 44-65; corollas 4.5-5.5mm, yellow.

Taxonomic Description cont.

- ♦ *Machaeranthera* spp. tend to have several short rhizomes arising from the caudex (woody base of a perennial).¹
- ♦ Rhizomes may or may not function in vegetative reproduction.¹
- ♦ Biseasonal (germinates in winter, but flowers and sets seed in summer).²
- ♦ Seed set greatly varied from season to season and shows significant responses to microhabitat differentiation.²

Use by indigenous people

- ◆ The Ramah Navaho used *M. gracilis*³:
- ◆ In a cold infusion used as lotion for pimples, boils and sores.
- ◆ In a cold, compound infusion of plant used as an eyewash.
- ◆ In a decoction of the plant taken for internal injury.
- ◆ As snuff to cause sneezing, clearing of a congested nose.
- ◆ Dried seeds for food.

Propagation

- ◆ Propagation by rhizome may be possible, but only seed is readily available.
- ◆ Seed is small (1000 seeds=0.318g)⁴
- ◆ My seed had a pappus (like a dandelion seed, for wind dissemination)
- ◆ Rocky Mtn. Nat. Park reports germination success using a 65-70F day/55F night greenhouse providing 70F from a heat pad under tent with misters set 8AM-8PM, with 10sec/15min watering intervals. One week after germ. mist without tent. Fafard Germinating mix was used. Manually sown on 36pk seed flat, 2-3 seeds/slot. Germination in 3 days was uneven.⁶



*A specimen that radiates like the sun,
With flowers surrounding like rays,
A effect reminiscent of each inflorence.*



Ideal Phenotype

- ◆ Very geometric with flowers opening to be completely spread open together to emphasize the radiating, sun-like effect.
- ◆ Very bristled foliage in open habit.
- ◆ Fragrant
- ◆ Cut flowers with longevity and holding color, that rivals sunflowers because the exposed stem adds rather than detracts from designs.
- ◆ Persisting ornamental phyllaries & flowerhead.



Market Niche

- ♦ The yellow or gold of the flower would fit well into the Easter holiday.
- ♦ Can deliver a *burst* of spring color when the winter is dragging-on after mid February.
- ♦ The seed naturally germinates in January under cold 15-24C temperatures.
- ♦ Lifecycle can vary between 6-10 weeks or as long as 7-8 months depending upon watering frequency and amount & temperature.¹¹
- ♦ A desert race should be used because its modified photosynthetic system allows it to flower approximately 25 days prior to the foothills race when grown under glasshouse conditions.⁸
- ♦ It is a small ruderal herb⁹, making it good in disturbed environments like annual beds and xeroscapes, rock gardens.
- ♦ The high salt levels of deserts where this plant grows makes it a candidate for sandy, salty, warm roadsides.
- ♦ Will compete with Easter-time daisies, because this desert plant won't wilt and droop like daisies.
- ♦ Bored of violet, pansies and bulb-flowers boring foliage, lacking any structural interest?
- ♦ A new day for Easter flowers is the yellow sun at the pinnacle of the strong upright stems of Slender Goldenweed.

Market Niche

- ◆ This could be a major crop:
- ◆ Because of its very quick life cycle,
- ◆ Because it could be sold in before spring in cold areas and then be planted out for early flowering in the home and garden.
- ◆ if the flowers all look their best at the same time on the same plant and across the populations sown by seed,
- ◆ If the structural beauty appeals to the consumer.

- ◆ Initial crop limitations/problems:
- ◆ Germination requirements need to be determined along with % viable.
- ◆ Great quantities of seed need to be produced every year for seed producers to supply the customer base, but in the wild abundance varies greatly from year to year¹⁰ suggesting that this may limit early bulking.
- ◆ Risk of becoming invasive is limited by its narrow habitat of deserts and mesic foothills, its small volume of seed produced and the fact that it doesn't readily germinate. Still some further work is necessary.

- ◆ The crop must be made known to growers and consumers before it's release, which could be very quick considering the standard breeding can be advanced quickly with its short life-cycle

Anticipated Cultural Requirements

- ♦ Winter Hardiness not exactly applicable because of the annual nature of the plant.
- ♦ Heat and drought tolerance.
- ♦ Temp. 65-70 degrees F day/55 degrees F night greenhouse, if heat costs are not prohibitive ideal day temp is 77 degrees F.⁶
- ♦ Container size: 196 cell trays for germination transplanted into 6, 8 or 12" azalea pots, so that the spreading stems reach beyond the pot lip by sale.
- ♦ Light: maximum irradiance, provided by natural sunlight was 575 plus or minus 100 uE/m².
- ♦ Relative humidity: fluxuated between 10-30% and 30-45% respectively in the two greenhouses.

Anticipated Cultural Requirements

- ♦ Media: germinating mix (sand-clay in wild)
- ♦ Nutrition: grower should test, but be careful to apply low levels of nutrients in irrigation water rather than a granular fertilizer that might stress a desert/ mesic plant not used to receiving as much irrigation as greenhouse production would provide.
- ♦ PGRs: may be necessary if high intensity light isn't provided to keep plant stature low, but little canopy competition in natural environment hasn't selected for tall plants.
- ♦ No known disease susceptibility or insect problems.

Production Schedule

◆ Plug stages:

- ◆ allow 55 degrees F nights throughout and EC of less than 0.5mmhos/cm from a 2:1 dilution.
- ◆ Gaps filled in by using sunflower production schedule, appropriate because *Helianthus annuus* shares the same SW environment as *Machaeranthera gracilis* and they are found together in Tuscon, AZ¹²

1. 3-7 d; seed lightly covered, under mist, 77 degrees F.
2. 3-11 d, medium moisture (like sunflower); 65-70 degrees F.
3. 8-14 d; 65 degrees F, 100-150ppm N once per week; consider PGRs and concentrations.
4. 2-6 d; fertilize as needed.

Do not hold plugs; transplant into final azalea container, grow on for 19-33 days to flower.

Genetic Improvement

There is a need for more predictable days until flowering that could be achieved through traditional breeding efforts.

Additional traditional breeding to achieve the ideal crop phenotype with improved fragrance, even flowering, and suitability for cut flower arrangements.

Sources

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