

***ISOCOMA ACRADENIA* (GREENE) GREENE**  
**VAR. *ACRADENIA***

**COMMON NAME: ALKALI GOLDENBUSH**  
**FAMILY: ASTERACEAE**  
**GROWTH FORM: SHRUB**



### PLANTING

During January 2003, seeds were hand-sown onto mounded planting beds, and a thin layer of soil was then raked over them. The seeds germinated readily without any form of pre-treatment. The first seed harvest from the plants was made during October 2003. The Tranquillity area has a semi-arid climate with low mean annual precipitation. However, the 2002-03 growing season was a favorable year for shrub establishment at the nursery. Total precipitation received during the 2002-03 hydrologic year (1 August 2002 through 31 July 2003), 17.6 cm, was 80.2% of the 30-year mean<sup>1</sup>, and precipitation received during April and May of 2003 was at least 25% above average (California Irrigation Management Information System, Station #105). We provided the plants with supplemental water during their first year of growth, via flood irrigation, but did not water them in following years.

### PHENOLOGY

We have observed *I. acradenia* seedlings growing at the nursery at several times throughout the year; the species does not seem to require a high level of soil moisture for germination. In a year with ample winter precipitation, we observed the species flowering during June. In a year with below average precipitation, plants did not begin flowering until mid-August. We have observed the species in flower through the beginning of October. When growing in the

<sup>1</sup> The annual and monthly means were calculated using 30 years of precipitation data (1976-2006) from four weather stations (Cooperative Station ID #'s 43083, 45118, 45119, 45120) located in the western San Joaquin Valley.

San Joaquin Valley, the species seems to flower for a period of two to three months. Seeds begin to mature during mid-September, but the peak time for seed collection seems to be during late October through November. However, we have collected seed during December in some years. During winter, the plants go dormant and drop their foliage. We have observed new foliage displayed during March.

### SEED HARVESTING

Seeds are ready for collection when they are 'fluffy' in appearance (due to an attached pappus), and are easily released from the receptacle. To collect seeds, we would: 1) shake or hand strip them into a collecting bag; 2) vacuum them from plants using a shop vacuum and gas-powered generator; or 3) clip seed heads from plants. Windy days during autumn can cause seed dispersal. If a significant quantity of seed has been dispersed from the plants just before a seed collection visit, we have vacuumed seed off the ground from the base of the plants. This method is not ideal because of potential for contamination with seeds of other species or deterioration in seed quality. But if the seed appears to have fallen recently and has not become damp or mixed with soil and plant litter, a seed collection of reasonable quality can be made. Because the species has a long seed collection window, seed collection on multiple dates is ideal, in order to capture both early and late maturing seeds. Harvested plant material is transported to a warehouse and allowed to air dry, before seed processing.

### SEED PROCESSING METHODS

When seed has been shaken, stripped, or vacuumed from plants, very little seed cleaning is required. Some stems and floral structures such as the involucre may be present, but it would be easier to remove them by hand rather than using mechanized seed cleaning equipment.

When seeds have been vacuumed from the ground, soil particles will fall to the bottom of the vacuum receptacle, and the lightweight seeds will remain at the surface. Therefore, very little seed cleaning is required with this collection method.

When entire seed heads have been collected, we would gently rub the harvested plant material over a screen or sieve to release seeds from the receptacle. However, a screen or sieve is not very effective for separating seeds from chaff. The presence of an attached pappus that is wider in diameter than the seed will cause the seed to lodge in a screen, rather than passing through. If a screen is selected to accommodate the diameter of the pappus, the perforations in the screen will be so large that a significant amount of chaff will pass through the screen along with the seed.

An air separator (also known as a winnower) can be used to separate lightweight seeds from a heavier chaff fraction. This process is known as "reverse winnowing" and works well for wind-dispersed seeds of the family Asteraceae.

### CULTIVATION OVERVIEW

Numerous *I. acradenia* individuals have been established in the nursery since 2003, and they have reliably produced seed each year. Seed production was minimal during the 2006-07 growing season due to low rainfall. In dry years,

the mature plants do not perish but they produce less foliage and fewer flowers. Therefore, during a dry winter or spring, seed production would likely be enhanced by supplemental watering. The species does not seem to be susceptible to wildlife herbivory. Through seed dispersal, the species frequently became established in areas of the nursery where it was not planted.

**PREPARED BY**

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**PHOTOS**

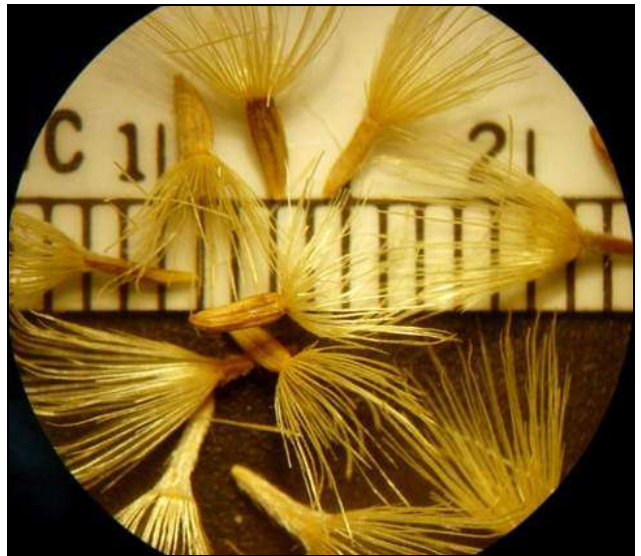


In the foreground, *I. acradenia* in cultivation at the native plant nursery. *Atriplex polycarpa* and *Allenrolfea occidentalis* are growing in the background.





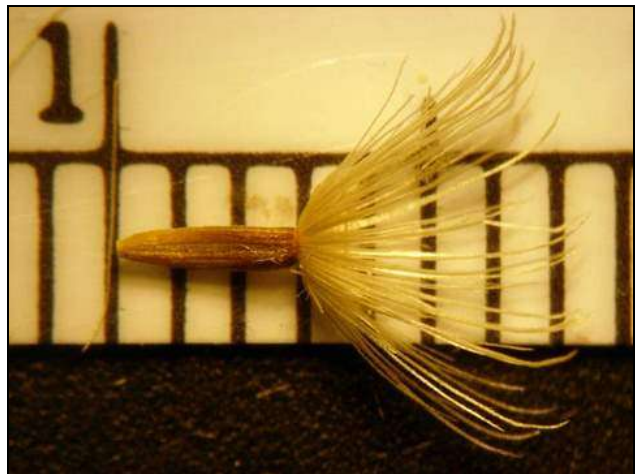
*I. acradenia* seeds are 'fluffy' in appearance due to an attached pappus.



*I. acradenia* seeds. Scale shown is millimeters.



An *I. acradenia* individual at the native plant nursery during December 2008, still bearing seed late in the season.



*I. acradenia* seed. Scale shown is millimeters.