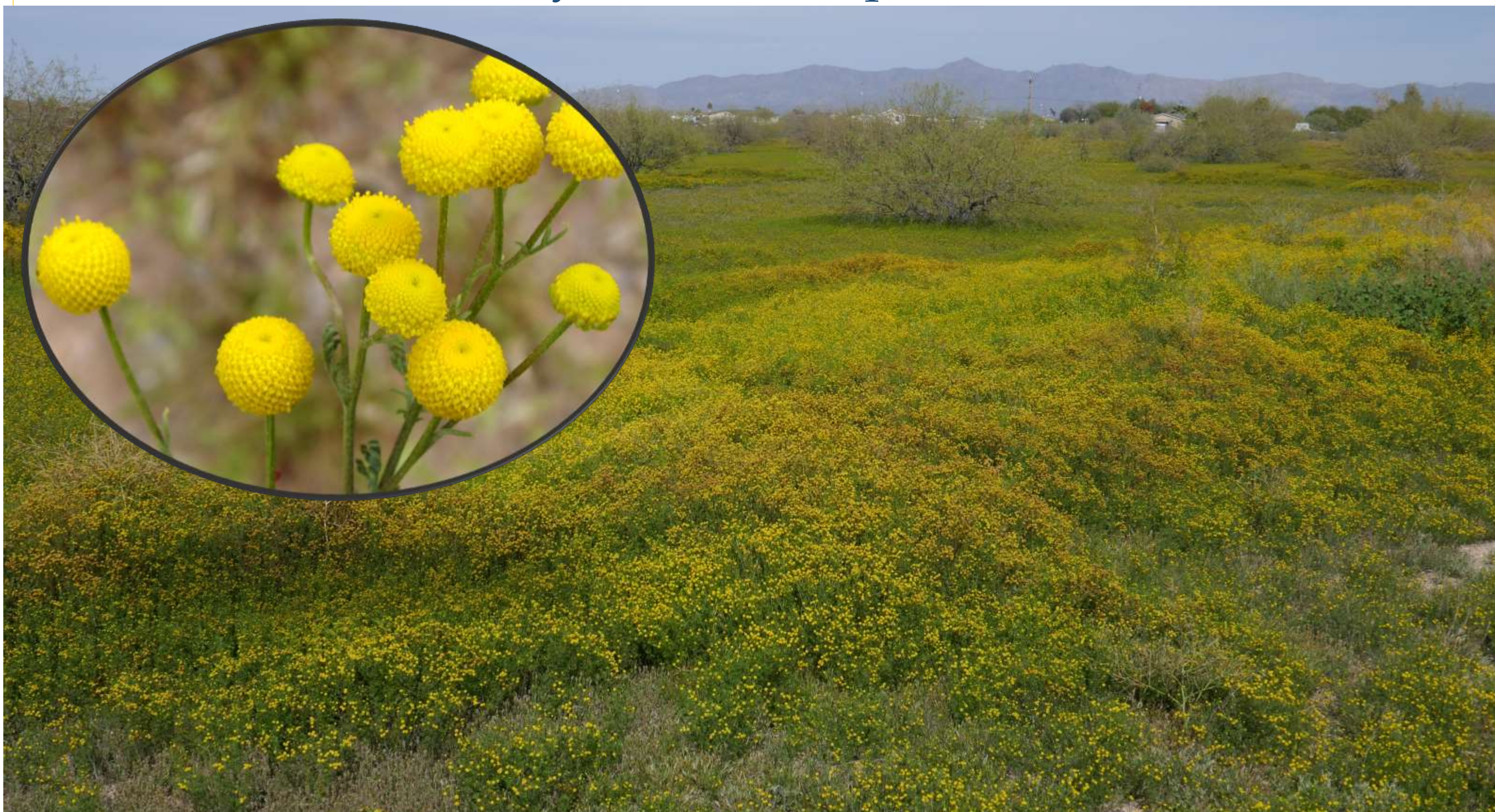


GERMINATION TRIALS TEST STINKNET RANGE SUITABILITY

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Summary

Stinknet (*Oncosiphon pilulifer*) is a cool season growing annual forb recently listed as an Arizona Class B Noxious Weed. Stinknet competes with Arizona's native vegetation. It is unpalatable to wildlife and livestock, and it causes allergies in some people. Dried stinknet fuels wildfire and supports a fire regime in the Sonoran Desert, an ecosystem not adapted to fire.



Stinknet infestation north of Tonopah, Maricopa County, Arizona. Stinknet flower heads (inset).

Introduction

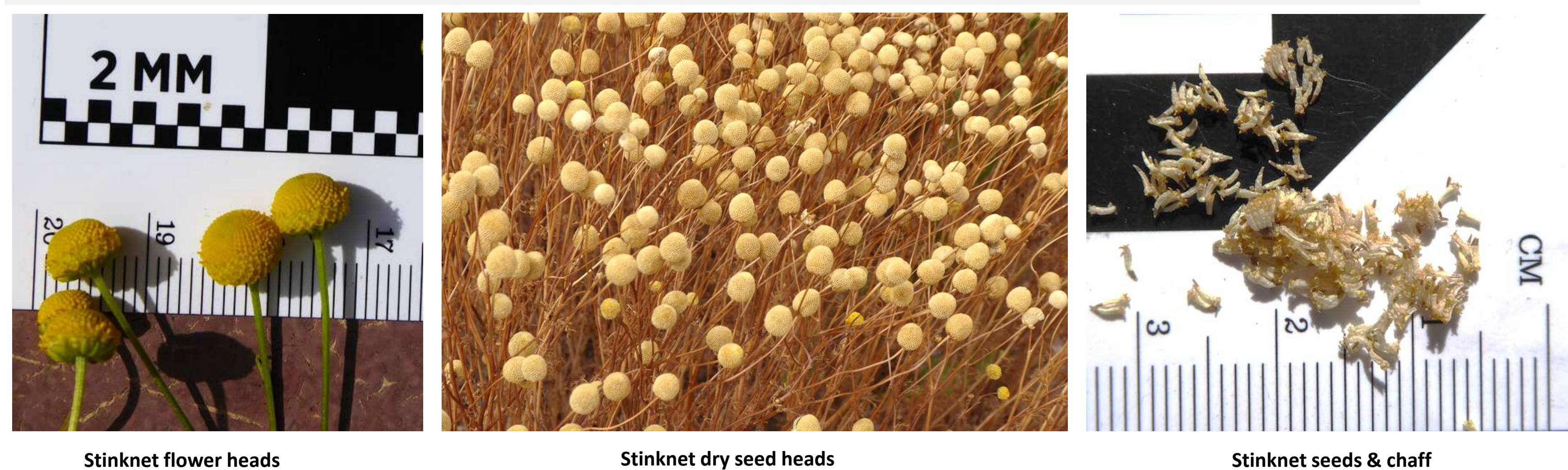
First documented in the United States in Riverside County, California in 1981, stinknet has proliferated in California. Stinknet was documented in Maricopa County, Arizona in 1997. It has quickly spread in both urban and wild areas. It continues to advance its spread into adjacent counties in Arizona, and also into Nevada and Mexico. The potential for stinknet to move into higher and cooler elevations in Arizona has been tested.



Control planters located in Phoenix, Arizona

Methods

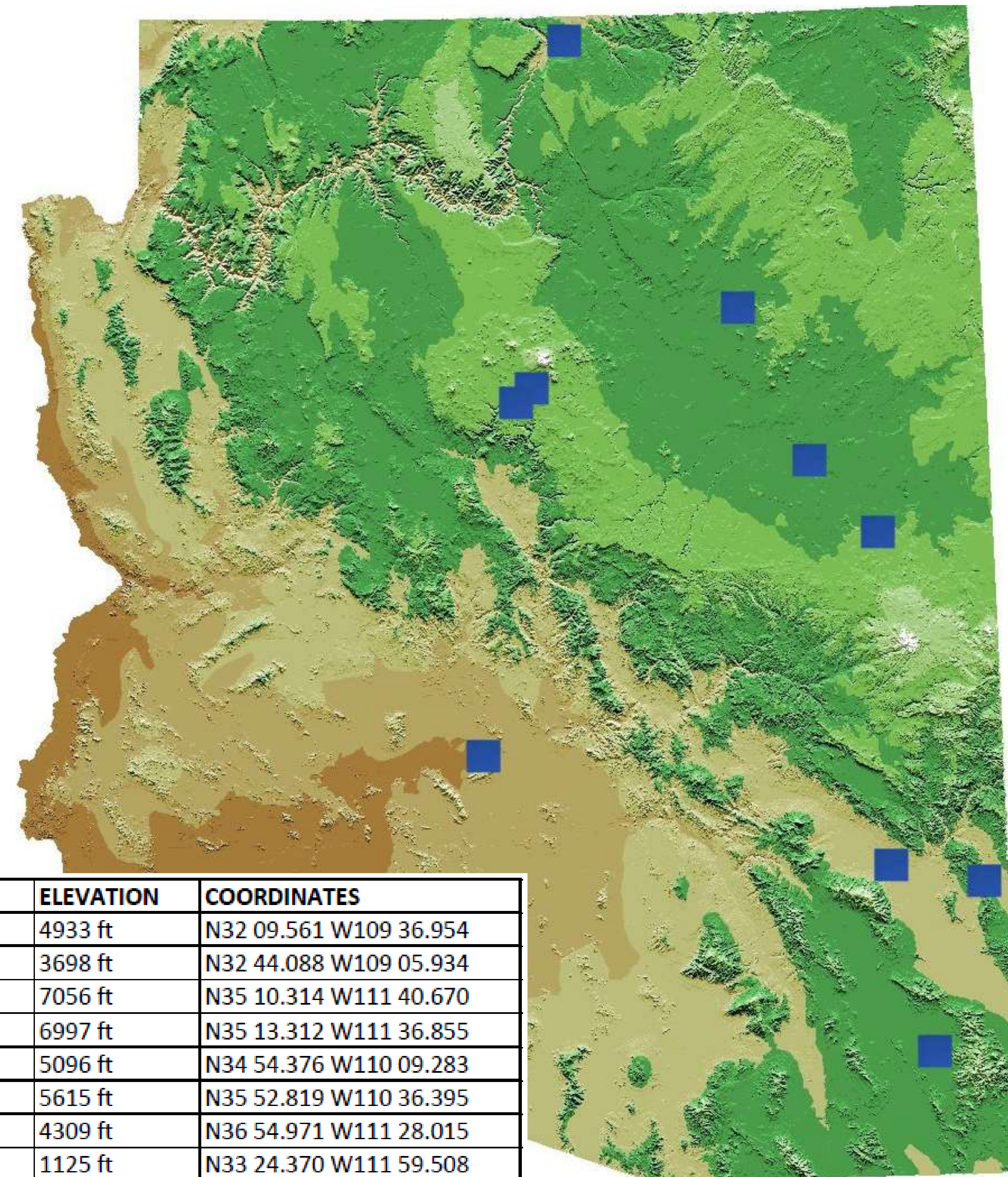
Test planters were seeded with stinknet seed and placed at nine Cooperative Extension sites around Arizona. Control planters were placed in Phoenix, AZ, where stinknet is rampant. The test planters were placed in northern and eastern Arizona locations with climates cooler than Phoenix and other stinknet-invaded regions. Planters were designed to contain stinknet plants and seeds and prevent their escape into the surroundings, while also designed to expose the growing space inside the planter to the ambient environmental conditions at the site. Approximately 0.04 grams of stinknet seed (plus chaff) was sprinkled into each planter and watered in as each planter was established. Planters received little or no irrigation afterward. Planters were monitored for stinknet germination and growth. Concurrently, stinknet seed viability was examined under controlled germination conditions indoors in petri dishes under LED lighting.



Stinknet flower heads

Stinknet dry seed heads

Stinknet seeds & chaff



LOCATION	ELEVATION	COORDINATES
Dos Cabezas	4933 ft	N32 09.561 W109 36.954
Duncan	3698 ft	N32 44.088 W109 05.934
Flagstaff, site 1	7056 ft	N35 10.314 W111 40.670
Flagstaff, site 2	6997 ft	N35 13.312 W111 36.855
Holbrook	5096 ft	N34 54.376 W110 09.283
Kykotsmovi	5615 ft	N35 52.819 W110 36.395
Page	4309 ft	N36 54.971 W111 28.015
Phoenix (control)	1125 ft	N33 24.370 W111 59.508
Safford	2959 ft	N32 48.889 W109 40.853
St. Johns	5763 ft	N34 30.726 W109 22.687

Stinknet test planter locations

Results

Test planters were established in the winter of 2023. During and after the winter and spring of 2023 no stinknet germination was observed in the test planters. Germination was only observed in the control planters in Phoenix.

An unusually wet winter and spring in 2023 facilitated widespread stinknet germination in desert locations in and around Phoenix, and also in the control planters.

Stinknet seedlings in the control planters did not grow to maturity, they died with drying conditions in April of 2023 with warming and dry weather at the Phoenix site.

Controlled germination of the same seed supply used to seed the planters showed 42% germination. Stinknet seed frozen at -4°F for 48 hours showed 76% germination under controlled germination conditions.

Stinknet seedlings frozen at -4°F for 6 hours were killed.

Discussion

The failure of stinknet germination in cooler Arizona locations is a welcome indication that the weed may be limited in its ability to spread in Arizona.

Stinknet seed is tiny at less than 0.5 mm in length. Seedlings are correspondingly small, and sensitive to drying out. Late-germinating stinknet seed may be killed in dry warm conditions, as was the fate of seedlings in the control planters. Arizona characteristically enters a drying weather pattern in April and May, at the time temperatures at higher-elevation sites in Arizona are reaching the mild temperatures at which stinknet germinates. Stinknet seedlings are potentially vulnerable to hard freeze events at higher and cooler locations.

Acknowledgements

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References

- Chamberland, M. 2020. Stinknet: a Weed advancing in Southern Arizona. <https://extension.arizona.edu/sites/extension.arizona.edu/files/pubs/az1827-2020.pdf>
- Douglas, A. and D. Nicholson. 2019. Biology and Management of Matricaria (*Oncosiphon piluliferum*). <https://grdc.com.au/resources-and-publications/grdc-update-papers/tab-content/grdc-update-papers/2019/02/biology-and-management-of-matricaria-oncosiphon-piluliferum>
- Hedrick, P. and C. McDonald. 2020. Stinknet, A New Invasive, Non-native Plant in the Southwestern United States. Desert Plants 36:1.