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Nipomo Lupine Seed Status Report 2022
July 2022
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CDFW Research Permit 2081(a)_21-025_RP

This report is a summary of the Cheadle Center's remaining seed including the seed produced during the 2021/2022 season. The Cheadle Center has been working on the propagation and seed bulking of *Lupinus nipomensis* since 2012. This report focuses on the remaining seed in store from the past three growing seasons, 2020, 2021, and 2022.

Sand for the growing was collected by Wayne Chapman and Lindsey Roddick on October 20 2021, near the Philips Conoco site at or near 35.042863, -120.589544 and brought back to the CCBER nursery where it was mixed with perlite at a ratio of 50% by volume and filled in 2 gallon pots (TEKU MCI 26). Seed collected from the previous 2020 and 2021 seasons were selected for this effort. Seed were scarified with light pressure and a finger, pressed against 400 grit sand paper and dragged for approximately 5-10 cm per seed. These were then rinsed briefly (30 seconds) in 3% H₂O₂ followed by being immediately rinsed in RO water, and placed immediately in a petri dish in groups of 10 seeds with approximately 1.5cc RO water. These were placed in a dark box, which itself was placed in a refrigerator for 12 hours and alternated daily into a room-temperature pantry for 12 hours, respectively. Curiously, despite same storage conditions, the seed from 2020 displayed a notably lower germination rate. Once seed began to show a radicle emerging, they were transported several times per week to be sown in the sandy growing medium, and planted about .6 cm deep and watered in.

All plants were occasionally fed (1-2 X per month) a mixture of hydrolyzed fish powder (Down to Earth brand, solution grade, 12-1-1) and liquid kelp (Growmore brand Seaweed Extract 0.10-0-0.44) at a rate of 4 tbsp/gal each, combined, at a rate of approximately 30 cc per pot every few weeks and watered as needed depending on the weather.

Caterpillar predation was notably heavier than in any previous year since the propagation of this plant began, prompting several treatments with BT (*Bacillus thuringiensis*) an organic caterpillar bacterial control for the first time. Numerous plants were lost to heavy caterpillar

predation, and repeated treatments were necessary (**Figure 1**).



Figure 1. *Lupinus nipomensis* heavily predated by caterpillar

After weekly treatments of *Bscillus thurigiensis*, several dead caterpillars were visible **Figure 2**.



Figure 2. Large dead caterpillar after treatment with BT.

Seed was collected numerous times per day or week as time allowed, however less hands were available for this time sensitive task (Figure 3).

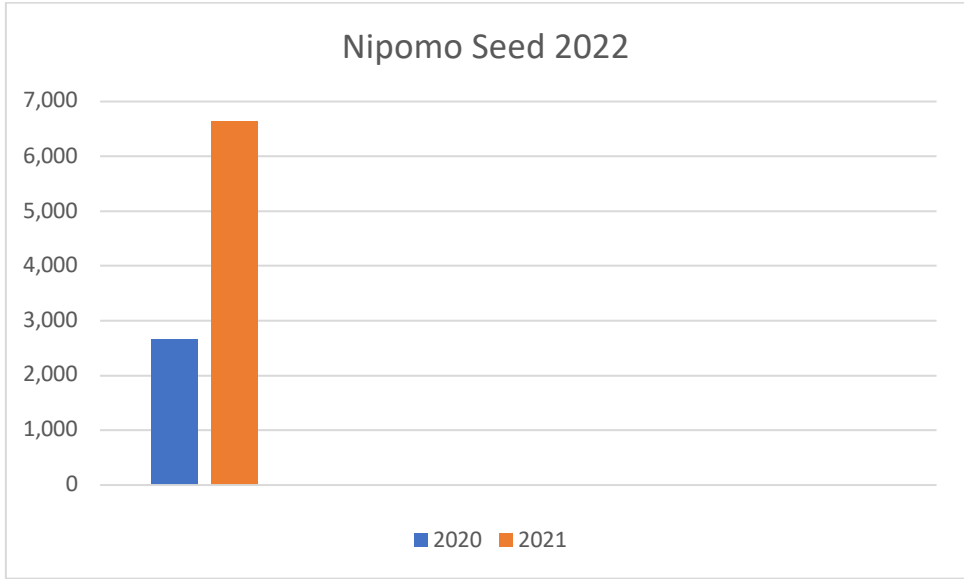


Figure 3. *Lupinus nipomensis* plants during seed collection

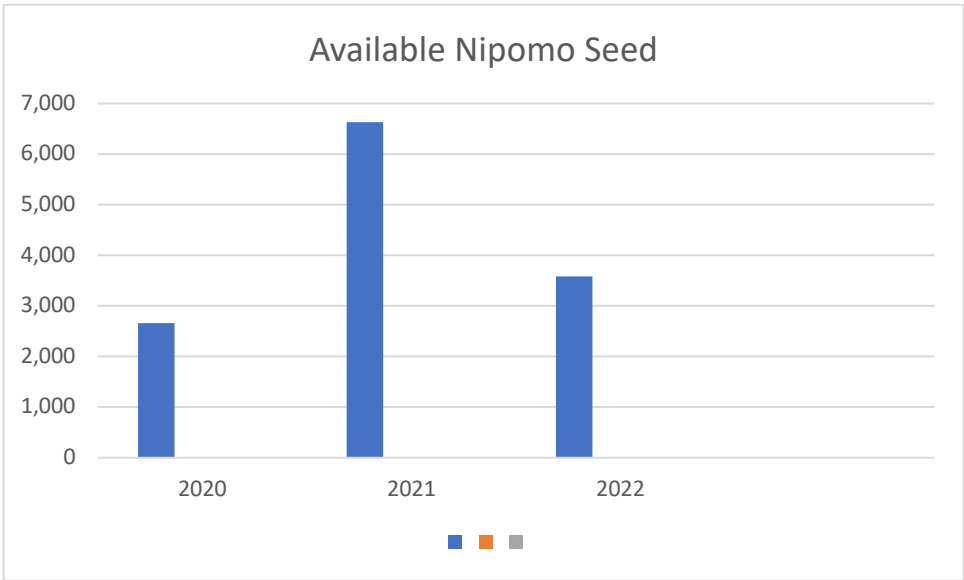
Since the fruits pods of *Lupinus nipomensis* mature at a steady rate once fully developed, seed collection must be done numerous times per day, every day, to avoid missing ripening fruits and seed being lost. Since this was occurring due to less available seed collectors, some pods were prematurely harvested when beginning to turn yellow in anticipation that they would after ripen in the collection bag. This has been a normal technique in our collecting of the species' seed, but was pushed somewhat farther in some instances when warm weather was anticipated and no seed collection would be possible, for fear of losing more seed. Fully viable seeds are usually glossy, mottled, dark brown, and plump, while typical non-viable seed are often matte, yellow, and compressed.

It did appear that a percentage of these seeds were not fully mature after drying out, making the distinguishment of viable and non-viable or undeveloped seeds more difficult.

Seed were finished being collected and counted in June. Although plants were healthy and displayed no disease, the heavy caterpillar predation made for a lower seed count. In all, **3,580** viable seed and 551 non-viable were collected from the 2022 season.



Remaining counts of seed for the past years are as follows: 2020- **2665 seeds**, 2021- **6,636 seeds**, and 2022- **3580**



The total seed count remaining in hand is **12,881**. Approximately 150 seeds have also been collected from BLEA from the wild during the spring of 2022 and retained for seed bulking at the CCBER nursery for 2023.