"NEWS FLASH"

FIRST POPPIES OF 2018 SEASON FOUND

By
Michael Powell
With
Marsha Neill

POW!!!POW!!!POW!!! Celebratory fireworks went off when a few poppy cotyledons, see Figure 1, were found on the Poppy Reserve 18 Jan '18; my first visit to the Reserve following the 8-9 Jan rainstorm during which the Reserve's maintenance yard received 1.69 inches of rainfall.
Besides the poppy dicotyledons, a few still unidentified cots, and the various grasses monocotyledons, dicotyledons for the expected co-members of the poppy's vegetative community were also readily found; filaree dicots being the most numerous and fiddleneck dicots being the second most numerous, Figures 2 & 3. In addition, pygmy-leaved lupine dicotyledons, Figure 4, were also easily found but certainly not as numerous as the filaree and fiddlenecks. Even one blue dick monocotyledon was found, Figure 5.

Even though Marsha and I found only 4 poppy cotyledons in one of the one meter square monitoring plots, I don't believe that the limited numbers are a good predictor for the potential quality of spring poppy displays for several reasons; of course, the Reserve needs to soon receive a few more inches of total rainfall before there will be any kind of a wildflower season. With only ten days between the start of the rainstorm and our Reserve visit, we were lucky to find any of the hard to see poppy cotyledons. The poppy seed germination process is noticeably slower than seed germination for many other plant species; i.e. filaree and fiddlenecks. Where poppy cotyledons don't start to emerge from the soil for seven to ten days following water being added to the soil, filaree and fiddleneck cotyledons can be found emerged within two or three days following a rainstorm. Looking closely at the photographs of the filaree and fiddleneck dicotyledons, Figures 2 & 3, you can see signs of their advanced development. Two of the three filaree seedlings seen in Figure 2's photograph already have their first true leaf growing from the center between the cotyledon and I believe the small stub at the center of the fiddleneck cotyledon is the beginning growth of its first true leaf. Our plan is to re-inventory the same monitoring plot in the next few days to document any further poppy cotyledon emergence.

Before discussing more reasons I am not too concerned about the limited number of poppy cotyledons found in the monitoring plot, I'll briefly describe cotyledons. Seeds and their germination are worthy of being part of a longer article so I'll limit my comments here. Seeds themselves consist of a number of different distinct structures that are kept in a biological inactive state because they are dehydrated. The seed's cotyledons are one of these distinct structures. Seed germination occurs when the seed is exposed to adequate moisture to rehydrate its structures. This rehydration initiates a number of different chemical reactions that drive both cell enlargement and cell division creating new cells which can then enlarge. Seed germination proceeds in a number of different stages. The first stage initiates the growth of the plant's root system so it can absorb the plant's needed moisture and minerals. Once the beginning of the root system is established, the second stage is the growth of the seed's cotyledons and their eventual emergence from the soil. I liken the cotyledons to the seed's energy battery because its various starches, proteins and fats provide the energy to drive the chemical reactions without having to rely on photosynthesis. The final stage of seed germination is the beginning growth of the plant's true leaves which absorbs the energy in sunlight to power the continued plant growth and maturation.

A second reason I'm not too worried about the limited numbers of found poppy cotyledons is that this plot normally doesn't have many poppy plants growing in it anyway. Last year was an exception when record numbers of poppy cotyledons were surprisingly found in this plot but, even then, most of the poppy seedlings died before the growing plants started to bloom.

There is even a third reason why I am not that concerned. Based on our fifteen years of field observations, the researchers have noticed two consistent trends. The first trend is about poppy seed germination rates. Following rainstorms that deposit less than approximately 0.6 inches of rainfall, we almost never find any poppy cotyledons indicating that there is not enough soil moisture to trigger seed germination. As the rainfall amount increases, the amount of poppy seed germination also increases, for awhile. For strong rainstorms depositing two or more inches of rainfall, the amount of observed poppy seed germination decreases with increasing rainfalls. That means that there is an optimum rainfall amount that results in the maximum number of poppy seed germination. Although the optimum rainfall amount is not closely pinned down yet, we believe it is somewhere between one and one and a half inches. If we are correct, the 1.69 inches of recorded rainfall from the 8 Jan storm likely resulted in slightly reduced amounts of seed germination but all is not lost because of the second observed trend concerning the Reserve's rainfall patterns. For most storms, the western side of the Reserve receives more rainfall than the eastern side; some areas actually receive more rainfall than that recorded in the maintenance yard. This local rainfall pattern data comes from readings of a number of rain gauges that the researchers have located throughout the Reserve to supplement the official, maintenance yard rain gauge. The inventoried monitoring plot is located in an area that typically receives more rainfall than the maintenance yard so it is possible that the poppy seeds in the monitoring plot were exposed to even more rainfall than the recorded 1.69 inches resulting in less poppy seed germination than expected. The good news is that the areas along the Lightning Bolt and Antelope Loop trails likely received less rainfall during the 8 January rainstorm and we could expect more poppy seed germination in those areas. We have observed this pattern in past seasons where the east ridge areas have had some of the best poppy displays.

The bad news is that there were problems with our installed rain gauges so, therefore, we are unable to confirm local rainfall amounts. In the fall of 2016, we decided to replace our rain gauges because they were starting to show wear and tear after being exposed to the extreme climate of the high desert for many years. Unfortunately, we discovered after the January storm that all of the new rain gauges had failed and were leaking after being in the field for only one year. We are currently in the process of replacing the rain gauges with a different style of rain gauges. Hopefully, they can all be installed before the next rainstorm.

I'm going to attempt to prepare and post "News Flashes" for individual visits to the Reserve to report the major findings but won't promise to cover each and every Reserve visit. It would be valuable to receive feedback if these postings are enjoyed. My email address is: mfpowell@verizon.net

FIGURE 1: DISTINCTIVE DOUBLE FORKED POPPY DICOTYLEDON

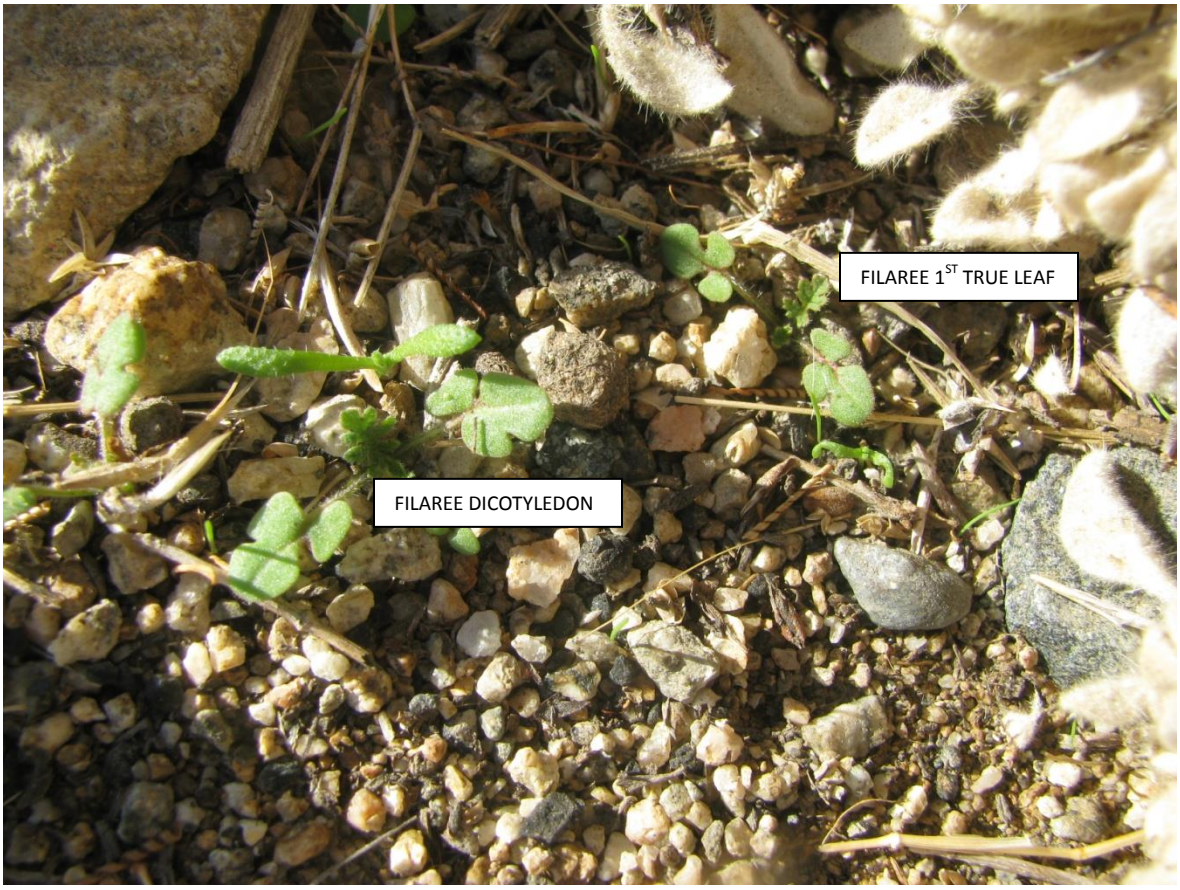

FIGURE 2: PAIRED THREE LOBBED FILAREE DICOTYLEDON

FIGURE 3: SPIKEY FIDDLENECK DICOTYLEDON

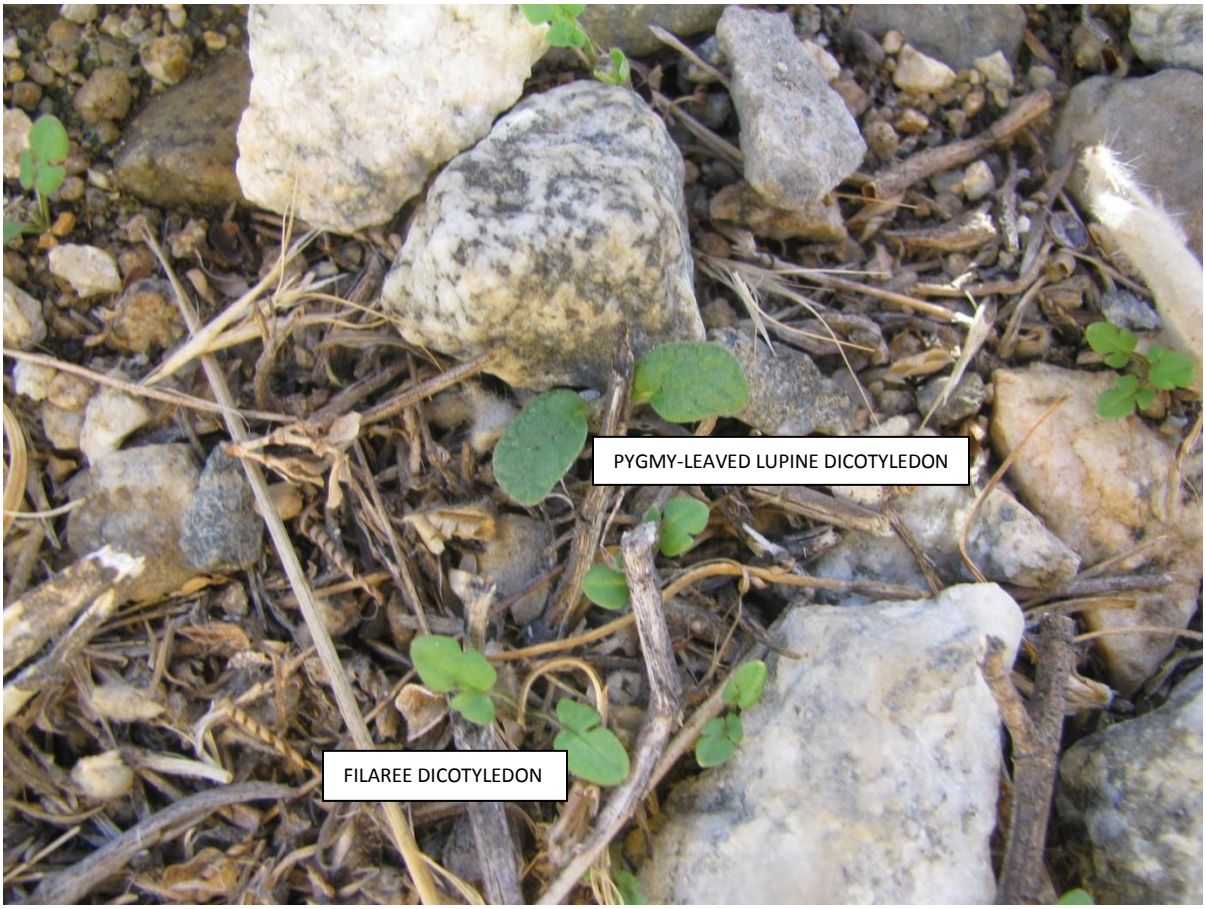

FIGURE 4: KIDNEY SHAPED PYGMY-LEAVED LUPINE DICOTYLEDON

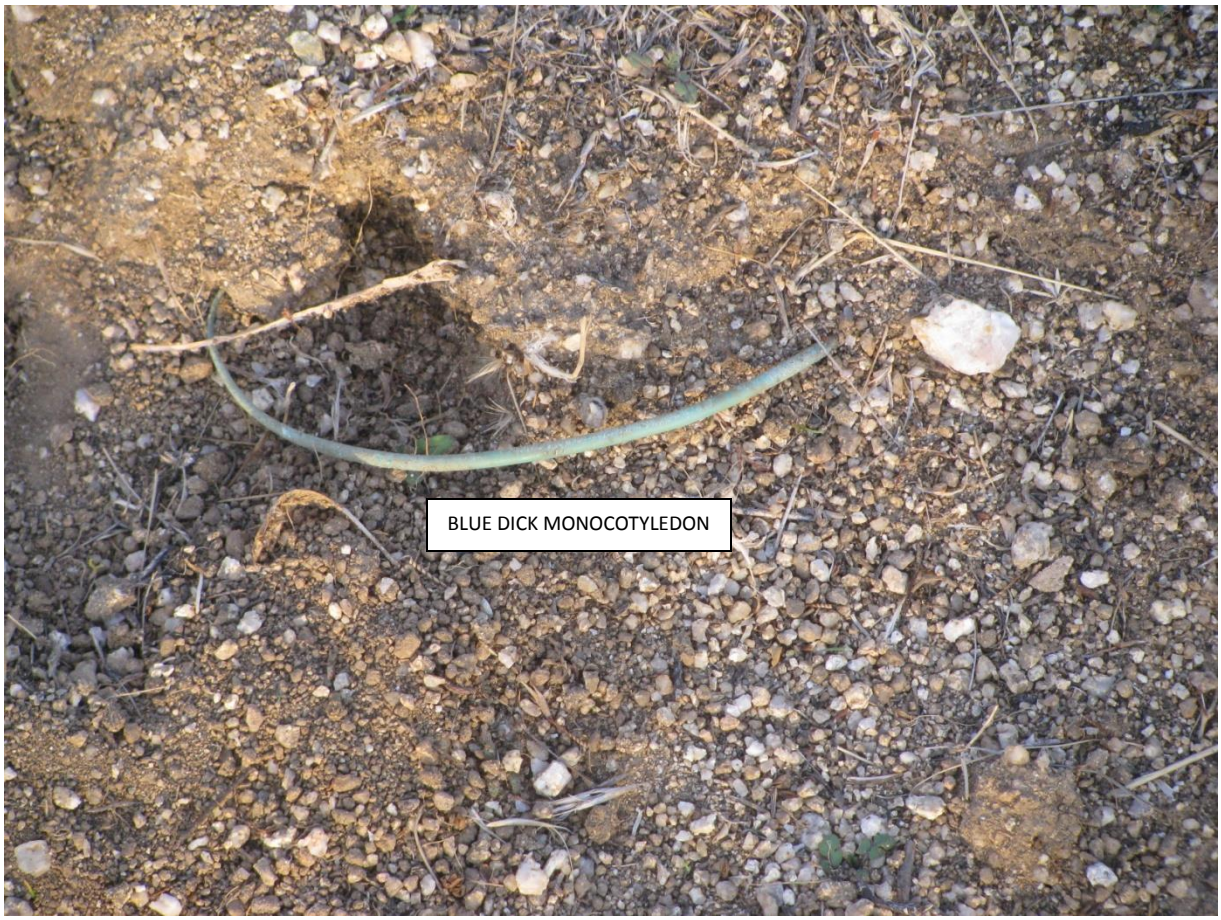

FIGURE 5: BLUE DICK MONOCOTYLEDON