COLLEGE OF AGRICULTURAL, CONSUMER AND ENVIRONMENTAL SCIENCES

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Digital Plant Identification

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Detailed plant characteristics are needed to identify plants. A combination of high-quality pictures of a plant while vigorously growing along with a complete plant specimen for examination are preferred. COVID-19 travel and social interaction restrictions have limited mobility and increased dependence on sharing information in digital format. When a physical plant specimen cannot be collected, pictures of plants continue to be received by NMSU with requests for identification and subsequent management recommendations. Extension personnel enjoy using their plant knowledge and experience to identify unknown plants - regardless of specimen and photo quality. However, pictures frequently are taken without the level of plant detail required by plant identification keys like Flora Neomexicana III (Allred and DeWitt Ivey 2012). The following suggestions include helpful hints on taking pictures useful for plant identification.

- Search for a live and complete plant specimen to photograph, if possible.
- Set camera to the highest resolution with the largest file size.
- Multiple high-resolution pictures with the plant in clear focus are needed.
- A picture of the whole plant shows characteristics like plant structure and size.
- After taking a picture of a complete plant, move the camera closer to the plant and take the following pictures: 1) flower in bloom from top and side views; 2) reproductive structures (e.g., seeds, seedpods, cones, fruit; 3) upper and lower leaf surfaces; 4) connection points between leaves and stems; and 5) roots connected to the stem, if possible. The part of the plant being photographed should fill most of the picture.
- On touchscreen cameras like mobile phones, often it is necessary to hold the camera steady and touch the point on the screen displaying the specific part of the plant being photographed.
- Review pictures before leaving the site where the plant is located so that pictures can be retaken as necessary.
- To ensure pictures clearly display the level of detail needed for plant identification, ask the following questions: A) for pictures of flowers, “Are the flower petals in clear focus and easy to count?” B) for leaf and stem pictures, “Are the minute hairs on the leaves when present, in clear focus?”
- Email the pictures as attachments rather than imbedded in emails or texted. Attached pictures are easier to magnify on computer screens when examining minute details.

- Ensure that the original file size of the picture is maintained during the emailing process. Check that the software used to email the pictures does not reduce file size from that of the original picture. Here is a link to a brief article by the New York Times about how to send high-resolution pictures (https://www.nytimes.com/2018/01/16/technology/personaltech/high-resolution-photos-email.html).
- Picture file sizes should be in the megabyte (MB) range, which means that multiple emails will be required to send several original size pictures. The maximum size of an email sent within the NMSU email system is 30 MB. If the email is not delivered or "bounced back", you will need to send more emails with fewer attached pictures per email.
- Information about the setting or environment where the plant grows is important. This information also includes facts about how the plant is used.
- Common ways of describing where a plant grows and how the plant is used include: pasture, rangeland, intensively-managed agricultural crop (e.g. alfalfa, pecans), garden, landscaped, roadway, gravel pit, grazed, non-grazed, dryland, irrigated land, wetland, submerged plants, heavy soil (e.g., clay), light soil (e.g., sand), gypsum soil, alkali soil, arroyo, mesa, playa, cliff, and other facts that make the setting desirable for the plant. Include all descriptive words that apply in the email.

Figures:

Whole plant

Flowers - top view, photo scale background

Unopened flowers - side view of seed head

Reproductive structures - fleshy cones

Leaves - showing structure and margins/edges, photo scale background

Leaves –backside and hairs

Point where leaves connect with stems

Stem - patterns and textures

Stems connected to roots

Happy photo shoots!