A Taxonomic Field Herbarium

Tod B. Williams and Richard E. Francis

Portable herbariums provide valuable reference for field identification of plants. Several methods of making field herbariums have been suggested. However, the intent of this paper is to improve specimen mounting sheets and add taxonomic characteristics. Neal (1963) described a procedure to construct field-going pocket herbariums using self-laminating plastic sheets. Benefits were to reduce training time and plant identification errors by temporary personnel.

Field herbariums can be developed for specific locations, key species, or research needs. Burleson (1975) suggested a technique for mounting green succulent plants in the field which eliminated the need for drying and pressing specimens. The method used plastic mounting sheets which preclude detailed specimen study, and the inclusion of taxonomic characters was implied, but not mentioned directly.

Fletcher suggested notebook style herbariums that utilize standard plant mounting techniques[1]. Pressed specimens are mounted on 8½ × 11 in. sheets of botany paper, labeled, and placed in a standard size 3-ring binder. Sheets of clear, nonadhering acetate are placed over the mounts for protection; with this style, all plant parts are visible and readily available for identification. The disadvantages are: (1) large notebook herbariums are cumbersome for field use, (2) the mounts become fragile with age, and (3) the acetate provides only partial protection from wind and rain. A variation of this style is to reduce the size of the mount and place specimens in a smaller notebook.

Another type of field herbarium uses clear, self-adhering acetate sheets to completely seal the plant specimens.

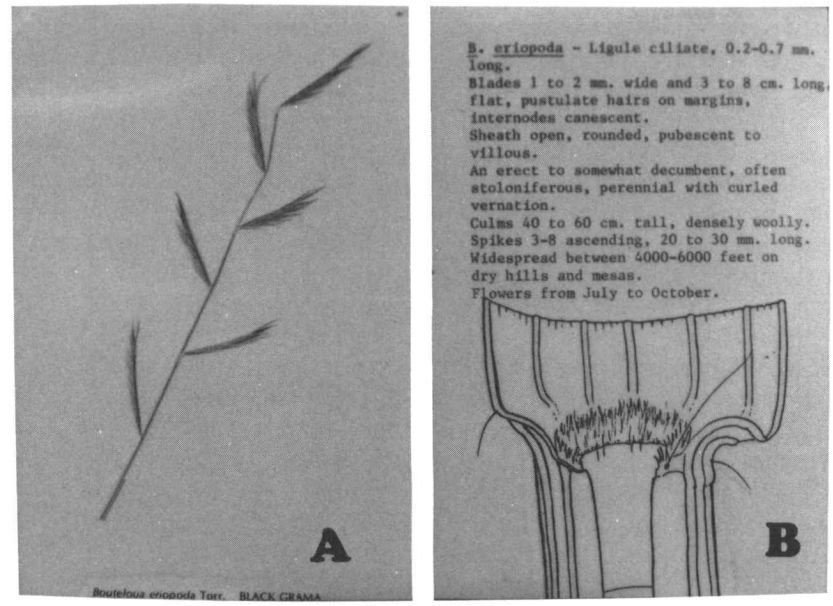

Fig. 1. *An example of a mounted plant specimen for used in a field herbarium. The mount is 4 × 6 in. The specimen is shown on the front of the mount (A); vegetative and floral characteristics are listed on the back of the mount. (B).*

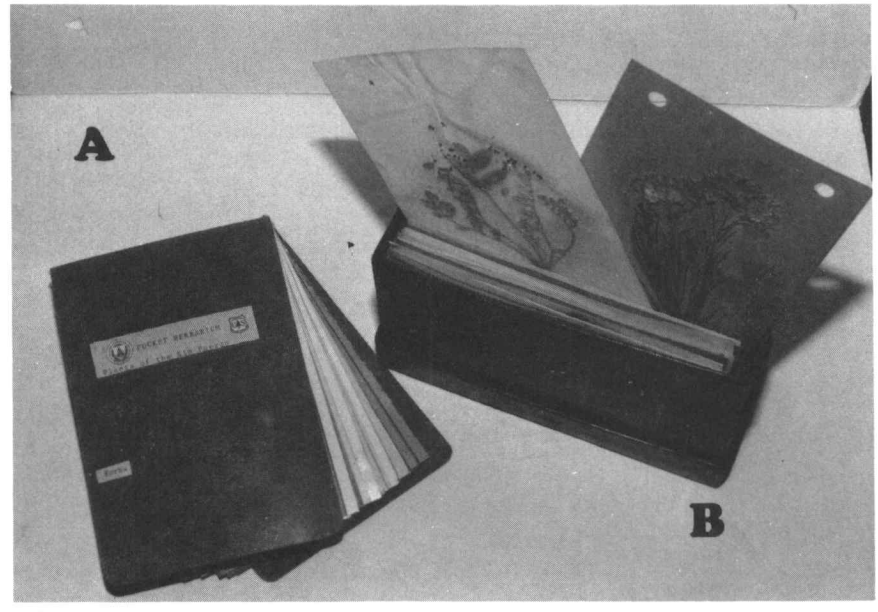

Fig. 2. *Plant specimen mounts can either be bound together in a binder (A), or boxed (B) separately and grouped by lifeform arranged alphabetically by genus-species.*

This provides a rugged, weather resistant mount which retains its shape and color for several years. The mounts are prepared by placing the self-adhering acetate on a flat surface, adhesive side up. A plant specimen and label are pressed face down on the acetate. Then, an acetate backing sheet is applied, and the amount is trimmed to the desired size. Mounts

Authors are range research technician and range scientist, respectively, USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Forestry Sciences Laboratory, Albuquerque, N.M. Station headquarters is in Fort Collins, in cooperation with Colorado State University. Williams is now range conservationist, Custer National Forest, Ashland, Montana.

[1]Reggie Fletcher, regional botanist, USDA Forest Service, Southwest Region, Albuquerque, N.M., personal communication, 1986.

can be punched and secured in a small binder with screw-type aluminum binding posts. A drawback is that sealing the specimen may obscure vegetative and floral characteristics needed for identification. The mounts also have a fogged appearance from the acetate adhesive.

Design and Application

A field herbarium which provides and maintains field mobility, specimen clarity, taxonomic verification, color, and a weather-proof mount can be constructed from self-adhering acetate cut to 4 × 6 in. sheets. The sheets are placed on a flat surface with the adhesive side up and the plant specimen and label are placed face down on the acetate. A piece of white botany paper is placed on the adhesive side to eliminate the fogged appearance of the acetate backing and improve visibility of the plant characteristics. Accurate identification can be enhanced by listing vegetative and floral characteristics on the back of the botany paper (Fig. 1). Characteristics needed for identification should include ligule diagrams for grasses or leaf characteristics for shrubs. Auricle, ligule, collar, and sheath characters are vital for vegetative or grazed grasses.

To weatherize the mounts, an additional 4 × 6 in. piece of self-adhering acetate can be applied over the botany paper. This provides a completely sealed mount which can be punched and placed in a pocket-sized binder for field use. An alternative to securing the specimens in binders is to store the mounts in small boxes, grouped by lifeform, in alphabetic order by genus (Fig. 2). In addition to taxonomic floras, several publications include vegetative descriptions and line-drawings which can be used as references for specific locations.

Self-adhering acetate sheets are available from most office suppliers in a variety of sizes. One 4 × 6 in. sheet of acetate and one 3 × 4 in. piece of botany paper is enough material for one mount, and costs about $1. Total time of assembly averages 30 minutes, depending on the number of identification characteristics included. Plant specimens can be collected and pressed before or at the time of seasonal vegetation sampling.

The field herbarium described has been used for several years by field crews with minimum botanical training. During this time, plant identification errors were reduced, less time was used keying plants, and the mounts retained their color and field durability. Field herbaria are useful for training field crews to maintain consistent plant identification from year to year by highlighting the most important characters of key species.

Literature Cited

Burleson, Wayne H. 1975. A method of mounting plant specimens in the field. Journal of Range Manage. 28:240-241.

Neal, Donald L. 1963. A pocket herbarium for range men. Journal of Range Manage. 16:145-146.

Low Risk versus High Risk Range Improvements

A.S. Law

Out of many possible plans, selection of the most appropriate range improvement is of critical importance to any project. Determination of the best alternative lies in what criteria are considered important. Cost and effectiveness are the two most widespread concerns. However, using more than one criterion for evaluation can be cumbersome. A more expensive treatment may be more effective, but will it be sufficiently more effective to justify the additional cost? How much of an area treated with a less effective practice will have to be re-treated, and at what cost? This article discusses a method of combining cost and effectiveness for evaluation of improvement treatments.

Range improvement practices are often selected on the basis of which treatment is expected to return a given level of net benefits at the least cost. Net benefits are the expected return of a treatment minus the expected cost. The expected cost of a treatment is the total of the initial and re-treatment costs.

Initial costs are relatively easy to calculate, but re-treatment costs will depend on a number of factors, such as the likelihood that a treatment will fail to reach and maintain the stated minimum level of benefits with only the initial treatment.

There are three factors involved in calculating which treatment is the most economical: Expected Results, Cost of Treatment, and Probability of Success. Combination of these three factors produces what may be called the Expected Final Cost of a treatment. The Expected Final Cost of each treatment can be used to compare cost effectivness.

High Risk Versus Low Risk Treatments

The factor which makes this method of analysis different from standard benefit/cost analysis is Probability of Success. What is Probability of Success? How does a high risk treatment differ from a low risk treatment?

Probability is defined as the chance that an event will or

A.S. Law is currently a graduate student in the Department of Range Science at Colorado State University.