

A New Seed Trap Design

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We describe a new seed trap design. Constructed of readily available materials, the trap is easy to carry into the field and assemble, retains seeds of most temperate forest tree species, and is sturdy enough to withstand several years of use. Tree Planters' Notes 48(1/2): 35-37: 1997.

Forest management activities generate a variety of reasons to collect tree seeds. For example, establishment of operational seedling plantations requires a large and reliable seed supply from which to produce planting stock. In this context, vast numbers of seeds are often collected from a single area (for example, from a seed orchard). Such seed harvesting has become relatively efficient and is sometimes mechanized. In contrast, certain other activities need only relatively small amounts of forest tree seeds. Examples include the evaluation of annual seed production and genetic quality of individuals being considered for inclusion in breeding programs, establishment of seedling seed orchards, assessment of the effects of timber harvesting on genetic diversity, and measurement of the nutritional value to wildlife of seed rain quantity and quality. Each such project may require a relatively small number of seeds from only 1 tree or just a few trees in each of several stands, but in many cases the maternal parent of each seed must be known. Because maternal parents are usually uncertain when picking up seeds from the ground, pole pruners, shotguns, and rifles are often used to harvest seeds from individual mother trees.

Unfortunately, direct collection by firearms and/or pole pruners is impractical when seeds are too high in the canopy and/or are difficult to see, as is the case in many temperate hardwoods. For such species, passive collection by traps—for example, Williams (1990); Phillips and others (1995)—can provide sufficient seed of known maternal parentage. Here we present the design of a seed trap that we have been using to investigate the effects of timber harvesting on white oak-*Quercus alba* L.—genetic diversity. This trap requires less assembly time and is easier to carry into the field than traditional traps. It also performs favorably in terms of longevity, retains a wide range of seed sizes, and is aesthetically unobtrusive.

The components of this trap are readily available at most hardware stores. One trap requires:

- ▶ 4 metal U-posts with hooks, each 4 ft (122 cm) long
- ▶ 1 section of plastic poultry fencing, with 3/4-in (1.9-cm) openings (5 x 4 ft; Tenex Corporation, Baltimore, MD)
- ▶ 1 section of fiberglass mesh window screening (5 x 4 ft)
- ▶ 1 piece of security fencing with 2-in (5-cm) openings (5 x 4 ft; Tenex Corporation) and 14 zip ties

On steep terrain the trap can be made level by substituting two 5-ft-long U-posts for the two 4-ft-long U-posts on the downhill side of the trap. The only assembly tools needed are an 8-lb (3.6-kg) sledgehammer, scissors, and a screwdriver or awl for opening the hooks on the U-posts.

Precutting the poultry fencing speeds up the installation process and decreases the amount of material that has to be carried by the field crew. Precutting begins by cutting ten 5-ft sections from a 4-ft-wide 50-foot-long (15.2-m-long) roll of plastic poultry fencing. Then an 8-in-long cut is made at each corner of the cut sections, parallel to the long ends and 8 inches from the edges, creating four 8 x 8-in flaps on each cut section (figure 1).

Field installation is rapid. A piece of pre-cut poultry fencing is placed on the ground at the desired site. Using the pre-cut slots as guides, 4 U-posts are pounded into the ground at the appropriate locations with the sledgehammer. Beginning at the top of the lowest U-post, 1 of the 8 x 8-in poultry fence flaps is wrapped around each U-post to form the 4 corners of an 8-in-deep "basket," so that the poultry fence engages the stakes' hooks. Each basket corner is secured to its stake with 2 zip ties, so that the top edges of the basket are level. Next, the fiberglass window mesh is laid over the basket and cut approximately 1 ft larger than the basket on all sides. A diagonal 10-in (25.4-cm) cut is made from each corner toward the center of the fiberglass mesh. The 2 resulting dog-ears at each corner of the window mesh are passed through the top sides of a corner of the poultry fencing basket, from the inside toward the outside of the basket, and tied behind the corner stake. This creates a "basket within a basket" (that is, fiber glass mesh on top of poultry fencing). Finally, a top is made from the security fencing by laying it over the basket so that the 4 stakes protrude through it. The security fencing is cut to be slightly larger than the basket on all

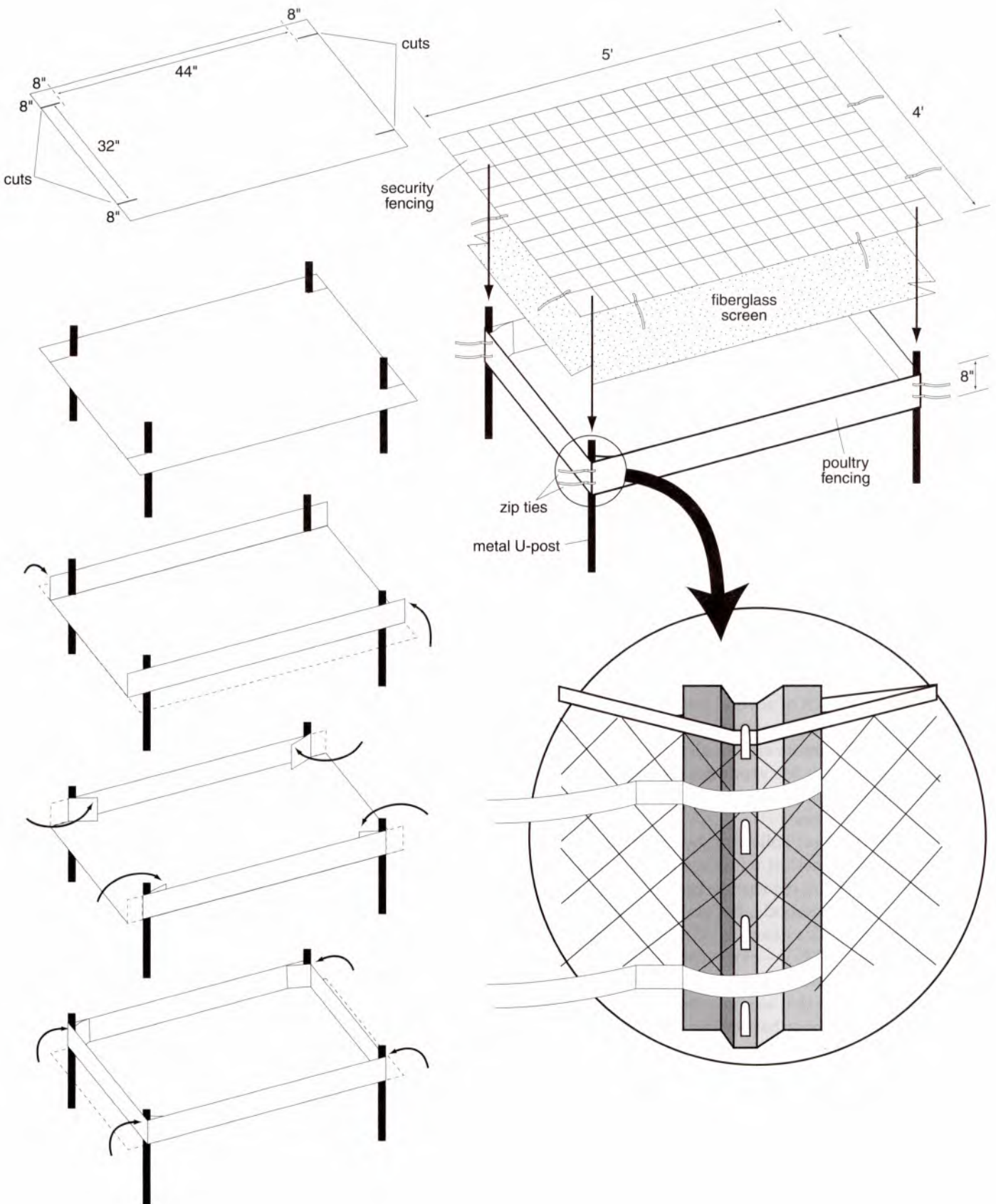


Figure 1—Exploded diagram of seed trap.

sides. Three edges of the security fencing are attached to the sides of the basket with 2 zip ties per edge. The overhanging fourth side of the security fencing is left unattached to allow easy access for seed removal, while still providing reasonable security from seed predators (figure 2).



Figure 2—Fully assembled seed trap.

Because the poultry fencing, fiber glass screen and security fence are all cut from 4-ft-wide rolls, the length of any trap (up to 50 ft) can be tailored to the specific needs of a particular project. We have found that the poultry fencing's 3/4-in openings can retain the majority of acorns of white oak, our current species of interest. A different type of fencing with a smaller mesh size may retain all acorns and make the fiberglass screen redundant, but for small-seeded species, the fiberglass screen is necessary.

A crew of 3 people can easily carry enough material to make 5 traps. Zip ties are used to bind stakes into

groups for easy transport into the field, and burlap bags serve to contain the pre-cut poultry fencing, a roll of security fencing, and a roll of fiberglass window screening. Scissors and zip ties are carried in field vests, and the sledge is carried by hand. With practice, one entire trap can be assembled by 3 people in less than 10 minutes.

At a cost of \$17.71 per trap for materials the installation cost appears high compared to other designs. However, the cost per year is low when averaged over the expected life span of the trap, especially when labor and repair costs are included. The poultry and security fencing materials have a usable life span of 5 to 7 years and can withstand temperatures ranging from -23 to $+49$ °C (Tenex, personal communication).

In their first year following installation, 3 of our 79 traps (3.8%) required maintenance or replacement. One trap was damaged by a coyote (confirmed by tooth marks in the plastic), and the others were damaged by falling limbs. Annual estimated repair costs are \$0.16/trap/year.

For aesthetic reasons, the U-posts, poultry fencing, security fencing, and zip ties can all be purchased in green to blend in with the understory. In areas of low visibility or low visitor levels, the plastic fencing can be purchased in bright orange for ease of location.

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