

PLANT CONTAINER UNLOADING TOOLS FOR NURSERY WORKERS

Problem:

Setting plants onto the ground from a trailer by bare hand can cause injuries to hands and back.



- Worker must repeatedly reach, grip, carry, and stoop.
- Reaching and forward stooping contributes to lower-back problems.
- Finger-pinch gripping can lead to tendinitis in hands.

One Solution:

Use handles to unload, lower, carry and place containers.



- Tool handle allows a full-hand "power grip" rather than a pinch grip.
- Decreases forward bending angle and amount of time spent in stooped posture.
- Reduces lifting strain.
- Can improve worker productivity.

Tips for Use of Tool:

It is advisable to use two tools and carry two plants, to balance side-bending forces upon the back. Do not carry containers that weigh more than twenty-two pounds each, to help avoid exceeding suggested lifting limits that may indeed be lower than a total of forty-four pounds plus the tools.

**University of California Agricultural Ergonomics Research Center
TIP SHEET 006 Nursery Container Unloading Tool**

HOW DOES THE UNLOADING TOOL WORK?

The tool has two parts: a) the curved hand-grip extension and b) the container coupling. It is made of aluminum and steel and works best with 5-gallon containers that have an external lip and are located on a trailer. From a standing position, the worker holds the tool by the bottom of the curved grip and reaches toward a container on a trailer. Then the worker slides the coupling point (8) under the container's lip, pulls the container and, by lightly reducing grip force, allows the tool and container to slide through a gloved hand down almost to the ground.

The tool can also be used for ground-to-ground spacing work. If the plants are tall or thorny, an interchangeable back-grip (Tip Sheet 001NT) is recommended.

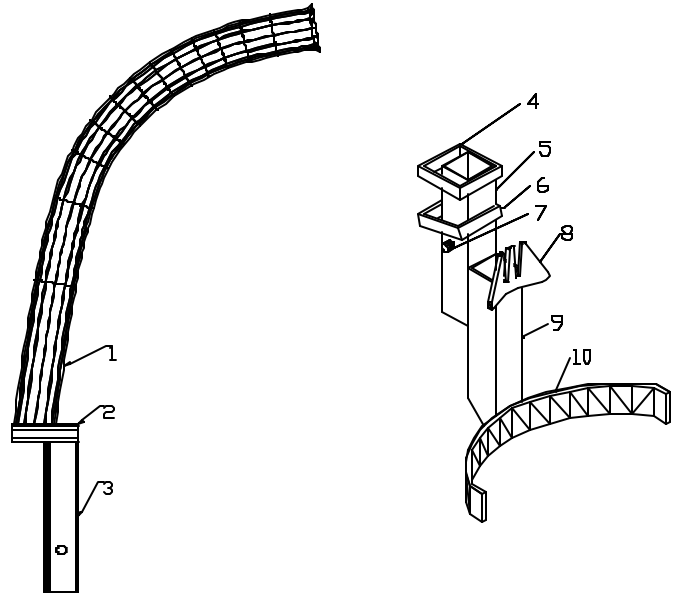
HOW MUCH DIFFERENCE DOES USE OF THE TOOL MAKE?

The tool shown here was designed for use in outdoor nurseries specializing in ornamental and bedding plants. At California nurseries where it was tested it reduced workers' forward bending angle by as much as 47%. The time spent working at a forward bent angle of more than 20 degrees was reduced by nearly one quarter. Hand gripping force required was reduced by more than half. Workers reported significantly less work-related pain using them, and those who had the most severe symptoms at the start reported the most improvement.

The use of the handle, in recommended applications of unloading and ground-to-ground movement, resulted in the same or slightly improved productivity.

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HOW TO MAKE UNLOADING TOOLS



Materials List & Construction Information:

- | # | Description |
|-----|--|
| 1. | 1.125" x 0.058" wall x 16"-long aluminum tube; bent carefully in 1"-pipe conduit bender with stabilizing rods inserted into both ends; ground and welded to Part 2 at 14°; top end flared; top end should be as or more horizontal than shown; approximate the curve shown; consider approaching a local machine shop that might have a computerized bender. |
| 2. | 1" x 1/2" x 0.125" wall x 2"-long aluminum rectangular tube; welded to Part 3. |
| 3. | 1" x 1" x 0.125" x 4"-long aluminum angle; 9/32" hole drilled on centerline of 1"-side of angle and 1.25" from bottom. |
| 4. | 1.5" x 1.5" x 0.094" x 0.375"-long steel sq. tube; welded along top joint. |
| 5. | 1" x 1" x 0.065" x 5"-long steel sq. tube; 0.25" hole drilled 2.5" from end & 0.375" from edge; welded to Part 9 w/ 2" overlap. |
| 6. | 1.5" x 1.5" x 0.094" x 0.375"-long steel sq. tube; remains loose on tube. |
| 7. | 0.25" D x 1"-long steel round; inserted into Part 5 and welded flush on the non-visible side in pictorial above. |
| 8. | 1.5" x 0.125" steel flat bar cut at about 45° with approximate top and bottom lengths of 2.5" and 1.0", respectively; notched generally as shown in pictorial above (notches are for container lips that have reinforcement ribs that may interfere with the coupling of the "point" and the container); ends bent slightly forward after welding; welded to Part 9 with 0.5" overlap. |
| 9. | 1" x 1" x 0.065" steel sq. tube; cut at 45°; 4.5" on long side. |
| 10. | 1" x 0.125" x 9.5" long steel flat bar; 0.5" end-bends pointing forward; approx. 7.25" overall width after rolling; welded at bottom of Part 9. |

Note: Steel may be substituted for aluminum for cost or fabrication reasons, but steel will increase the tool's weight from its the current 1.6 pounds.