

# Nursery Tools For Work Efficiency

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# The Healthy Farmers, Healthy Profits Project

Our goal: Find and promote work efficiency tools that maintain health and safety and increase profits for nursery growers in the upper Midwest.

Funded by a grant from the Centers for Disease Control's National Institute of Occupational Safety and Health (NIOSH).



# Today's topics:

1. Health problems we're concerned about.
2. Eight tools that save labor and are easier on the body.
3. Where to get more info on tools for growers.





# Target Health Problems

Cumulative injury, i.e. back pain, knee pain, and repetitive stress on hands, wrists and joints.

Traumatic injury such as crushed fingers or being pinned between tractor and wagon.



# **Eight tools that improve the speed, efficiency and safety of specific nursery tasks**

1. Field stool
2. Pot filling machine
3. Container stabilization methods



## **Eight tools, continued**

- 4. No-climb tarping systems
- 5. Electronic pruners
- 6. One person hitch
- 7. Long handled diamond hoe
- 8. Tree guard zipper





# Problem #1: stooping, kneeling or crawling to weed containers

- Hurts back and knees.
- Strains hamstrings and torso.
- Workers in unacceptable postures 56%-77% of the time.
- Workers are exposed to risk of injury.



# One solution: strap-on field stool

- Sit, kneel, lean, and change positions.
- Waist strap leaves hands free to work.
- Less strain on body.
- 40-66% less time spent in unacceptable postures.
- Cost: \$31-\$38.





## Problem #2: overstrain injury from scooping soil to fill pots

- Can affect fingers, hands, wrists, arms, shoulders, neck.
- Injuries slow to heal.
- Pain can be chronic.
- Pain causes lower productivity and time off work.
- Manually filling pots is slow.



# One solution: a pot filling machine

- Faster. If 20,000 pots filled/yr, save 250 labor hours. If 50-80,000 pots filled/yr, save 600-1000 hrs.
- Profitable. Recoup \$16K investment in 1.6 years if 50,000 pots filled @ \$15/hr.
- Prevent risk of overuse injuries.



# Types of pot filling machines



JAVO Unimax



Calzavara CO7 Nursery Potter



Pack Mfg 1/2 yard  
Batch Mixer w/ Potting Table



Demtec DT mini

## Problem #3: stooping to right containers

- Prolonged stooping hurts back & knees.
- Gripping causes hand and finger fatigue.
- Branches and stems can break.





# A solution: container stabilization systems

- Growers spend 50 hrs per year righting containers; 50 x \$15 (est. labor cost) = \$750/yr.
- Choose stakes, connectors, plastic inserts, plastic or wire baskets.



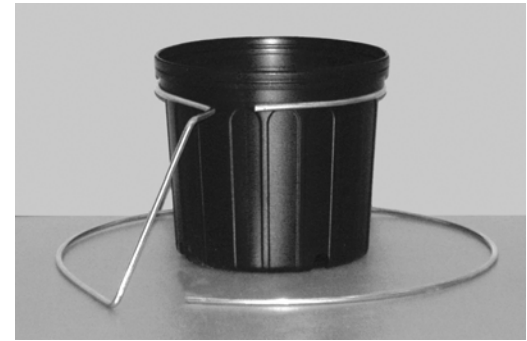
# Some container stabilization systems



Stakes



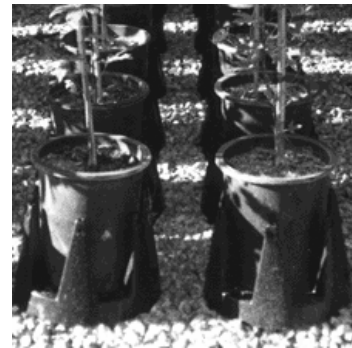
Connectors



Wire baskets



Plastic insert system



Plastic tree stabilizers

## **Problem #4: climbing a load to tarp a truck**

- Hurts knees and ankles and jumping to ground risks injury.
- Workers lifted on skid loaders risk falling.
- Crawling around plants breaks branches.
- Climbing slows you down.





# One solution: no climb tarp draping systems

- Faster.
- Some systems need only one worker.
- Better product quality.
- Different systems:  
Pole-hook (~\$50),  
Fixed roller (~\$300),  
Skid steer hook (~\$650),  
4 flagpole system (~\$2120)





# Some no-climb tarping systems



Pole hook



Fixed roller



Skid steer hook



Flagpole system

## **Problem #5: repeatedly squeezing and gripping to prune by hand**

- Strains hands, arms, and fingers.
- Large cuts require strong grip and force.
- Ragged cuts cause disease.
- Risks carpal tunnel syndrome, which costs time off work and ~\$10,000 surgery.



# One solution: electronic pruners

- Faster, can cut pruning time by 20%.
- Safer than pneumatic: blade responds to squeeze on trigger.
- Prevent hand and arm pain.
- Cost: ~\$1500. Worth investment if used 75 hours per year.



# **Problem #6: crushed between tractor and wagon while hitching**

- Very dangerous activity, workers risk serious injury.
- Skilled driver needed.
- Slow.
- Either two people needed or driver climbs down to hitch.





# One solution: a one-person hitch

- 90% faster.
- No special driving skill needed.
- Only one worker.
- No risk of crushed fingers or workers.
- Cost: \$800 for 1 tractor & 3 wagons.
- Payback in 5 yrs if 600 hitches/yr.



# **Problem #7: stooping and exerting unnecessary effort to hoe**

- Hurts back, shoulders, arms, wrists and neck.
- Chop hoes require more effort.
- No changes in posture to alleviate strain.
- Workers are exposed to risk of injury.



# One solution: a long handled diamond hoe

- Easy push/pull motion.
- T-handle lets worker change positions.
- Worker stands straighter (by 53%).
- Less effort needed.
- Fast and precise.
- Cost: \$35-\$40.





# Problem #8: installing corrugated plastic tree guards

- Gripping and spreading guards hurts fingers and hands.
- Stooping hurts back.
- Slow process.
- Stiff plastic edge can scar trees.





# One solution: a tree guard zipper

- Lightweight tool spreads open guard.
- 27%-37% faster.
- Stand straight.
- Less strain on hands.
- 24%-59% less time spent in unacceptable postures.
- Cost: \$45-\$50.



# These tools save time and reduce injury risk for nursery growers:

- Field stool
- Pot filling machine
- Container stabilization methods
- No-climb tarping systems
- Electronic pruners
- One person hitch
- Long handled diamond hoe
- Tree guard zipper



# Where to get more information



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