

Introduction

Experienced planters often incur ergonomic injuries or wrist or elbow pain from repetitive use of a shovel that is not designed properly.

Critical Task Inventory

- Adjusting Grip Diameter
- Adjusting Grip Twist
- Adjusting Shaft Length
- Adjusting Blade Size or Shape
- Kick Plate Removal
- Light Weight Blades

Adjusting the Grip Diameter

Introduction

There are 4 types of shovel grips to choose from:

- Staff
- D Handle
- Oval D Handle
- Ergo D Handle

Hazard Assessment

Task Steps and Hazards	F	S	P	R
Adjusting the Grip Diameter				
• Ergonomic Injuries (S)	2	3	1	6

Controls

Staff Handles

Favored by some planters in BC, the staff handle is just a different approach to gripping your shovel. Although previously rumored to be less likely to cause injuries than D handles, this has been largely discounted as it was found to reduce some injuries, but promote others.

D Handles

D Handles are the traditional type of grip for treeplanting shovels. These grips often have a thin layer of padding to offer some protection to the planter when a rock or root is hit.

Adjusting the Grip Diameter

Controls (continued)

Oval D Handles

Oval D Handles were sighted as far back 1990 but they were never formally part of the treeplanting equipment industry. This design has been thoroughly researched by world class ergonomists who were looking for a superior alternative to the traditional D handle. It should be noted that their studies were not specifically related to treeplanting; rather, it was focused on general hand tool use.



Increasing your grip diameter could contribute to you getting "The Claw".

Ergo D Handles

Researched by a BC WCB ergonomist during 2002, the Ergo D represents the best possible hand position for the planting of thousands of trees each day—particularly when it is mounted with a slight twist.

Adjusting the Grip Twist

Introduction

Changing the diameter of the handle can place an added strain on your muscles if you grip the handle too tightly to pull the shovel out of the ground.

Hazard Assessment

Task Steps and Hazards	F	S	P	R
Adjusting the Grip Twist				
• Circulation Injuries (S)	2	3	1	6

Controls

- Only people with large hands should consider adding padding to their grip.
- If your grip diameter is larger than stock, you might want to pull the shovel out of the ground with your hand on a part of the shovel other than the grip – possibly on the blade socket.

Frequency of Exposure (F)	Severity of Loss (S)	Probability of Loss (P)	F + S + P = Risk Rating (R)
1 = Up to Weekly 2 = Up to Daily 3 = 1+ Times / Day	1=Class C – Minor, non-disabling, non-disruptive 2=Class B – Serious injury or disruptive loss 3=Class A – Major injury, permanent disability or loss	1=Limited chance adverse event will occur 2=Adverse event likely to occur 3=Adverse event likely to occur soon	7 to 9 = High Risk 5 to 6 = Medium Risk 3 to 4 = Low Risk
Type Of Hazard: H= Health (acute or chronic) S= Safety (people and equipment) Q= Quality P = Production E= Environment			

Adjusting Shaft Length

Introduction

Recent studies suggest that a slight twisting of the shovel handle relative to the blade can increase comfort and reduce the potential for an injury.

Ambidextrous planters will not be able to twist their grip and still plant with their "other" hand.

Hazard Assessment

Task Steps and Hazards	F	S	P	R
Adjusting Shaft Length				
<ul style="list-style-type: none"> Arm / Shoulder / Wrist Strain (S) 	2	3	1	6

Controls

Twist the Grip

- Try taking out the screws that hold the grip to the shaft. Now, holding your shovel as you would while planting, slightly rotate the grip until your wrist feels like it is in its most natural position.
- If you would like to make the switch to a twisted grip, simply re-insert the self-tapping screws in their new position.



Pictured: Shovel lying flat on table.

Adjusting Blade Size or Shape

Introduction

It is generally accepted that you should size your treeplanting shovel to match the distance from your hand to the ground.

Hazard Assessment

Task Steps and Hazards	F	S	P	R
Adjusting Blade Size or Shape				
<ul style="list-style-type: none"> Back Strains (S) 	2	3	1	6

Controls

Sizing a Shovel

- Stand with arms at side.
- Stand up shovel next to body.
- Target shovel height is for the handle to line up somewhere between the tip of your fingers and your palm.

Fiberglass shafts are easier to customize and they are more than two times stronger.

Shortening Fiberglass Shafts

- Measure how much length needs to be removed.
- Remove the grip.
- Remove the plug (with a flat screwdriver and/or gripping tool).
- Measure and mark amount to remove.
- Cut shaft with hand saw (hack saws work best).
- Reinstall plug and grip.

Shortening Wood Shafts

Wood shafts are not easy to shorten. It is suggested that you either take it to a wood shop or replace the shaft with a fiberglass shaft. Please note: fiberglass shafts are not compatible with all blades.

Lengthening Shafts

- Buy a replacement handle.
- Fiberglass is recommended due to the added strength and ease of customization.

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Adjusting Blade Size or Shape

Controls (continued)

Really Short Shovels

Really short shovels can be great in the right planting conditions but they can be disastrous in others. It is not recommended that you shorten a shovel beyond the sizing guidelines unless the really short shovel will be an extra tool for use on special occasions.



Benefits of Really Short Shovels

When planting elevated microsites you can keep your hand on the grip without ever having to remove it when bending to plant a tree, or removing from the shovel from the ground. This can create a significant efficiency and it reduces the back strain associated with twisting your body.

Hazards of Really Short Shovels

When planting non-elevated microsites, when you put the shovel into the ground you have to be much more bent over. This has two potential draw-backs:

- Additional bending over, 1000-4000 times a day, really adds up and it can take an incredible toll on your legs and back.
- If you don't bend over enough when putting your shovel into the ground, you can hyperextend your arm. Once again, if you do that a couple of times a day, a few days in a row, your elbow is going to get injured.

Precautions

Use really short shovels only when planting elevated microsites.

Kick Plate Removal

Introduction

Some planters find that removing the kick plate(s) can reduce the frequency of "root hang-ups" and "finger catches" when planting.

Hazard Assessment

Task Steps and Hazards	F	S	P	R
Kick Plate Removal				
• RSI (S)	2	3	1	6

Controls

- Even if only one kick plate is removed, your usual kicking foot will have to become your only kicking foot/leg leading to repetitive strain injuries.
- Removing one or more kick plates can reduce the weight of the shovel and can eliminate your ability to use the kick plates when the ground gets tough.

Precautions

If your kick plates are bothering you, try grinding them down a bit and not completely removing them. This way you still have them both when you need them.

Light Weight Blades

Introduction

Light weight treeplanting shovels (often cut down drain spades) have less overall weight than traditional treeplanting shovels. Although this may initially appear appealing, recent studies suggest that light blades may lead to injuries when planting typical types of ground.

Hazard Assessment

Task Steps and Hazards	F	S	P	R
Light Weight Blades				
• Muscle Pulls and Strains (S)	2	3	1	6

Controls

- Never use light weight shovels in anything other than very soft ground without rocks or roots.
- Use your feet to assist with putting the shovel into the ground if any resistance is met.
- To avoid premature muscle fatigue, use the weight of your shovel to plant. Not the strength of your arm.
- Loosen up on the shovel grip just before it hits the ground.
- Customize the height and grip of your shovel.

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Light Weight Blades

Controls (continued)

Buried hazards

The other key hazard associated with using light shovels is the threat of hitting a buried rock or root. When you have to exert force to put your shovel in the ground, you have a far stronger contact with the shovel. Now, when you hit a rock or a root, you're going to feel it – big time. Your body just can't take that amount of abuse. Remember, you're planting thousands of trees a day, perhaps over 10,000 or 15,000 trees per 5 day shift.

Proper Equipment Set-Up

Choosing equipment that is customized for your height can make all of the difference to your day of treeplanting.

Hazard Assessment

Task Steps and Hazards	F	S	P	R
Proper Equipment Set-Up				
• Personal Injury (S)	3	3	1	7

Controls

Shovel Height

Shovels that are too tall or too short for the user, and the ground conditions, can contribute to ergonomic injuries. See the *Treeplanting Shovel Sizing and Customization Hazard Assessment and Training Briefing* for guidelines and precautions.

Shovel Weight

Preliminary studies suggest that planters who use light weight shovels may be more pre-disposed to injury. A certain degree of shovel weight is important:

- Use the weight of your shovel to help get it in the ground. The less effort that you exert with your arms to create the necessary downward force the better.
- Shovel weight is directly correlated to the amount of shock you feel when you hit a buried rock or root. Light weight shovels transmit a much stronger jolt.

Precautions

- Avoid using a light weight shovel for anything other than the softest of ground conditions.
- Minimize arm effort by using your feet to help push the shovel in the ground.

- Be aware of changing ground conditions that could make a light shovel hazardous to use.

Shovel Grip

Shape

New handles are available for planting shovels that place the wrist in a more "Ergonomically correct" position. New planters and planters with a history of ergonomic injuries are encouraged to use these designs.



Twist

Any planter can benefit from improved tool ergonomics by slightly twisting their grip relative to the blade. This, however, makes the shovel suitable for either left-handed or right-handed use – not both.

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