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The following manual will be used by Garden Coordinators in the training of students and staff for the use of the UC Davis resident gardens. This manual will also be a reference for basic safety and maintenance procedures for the resident gardens.

For addition safety questions, issues and/or concerns, please contact:

**Joel Biederer**  
*Safety Coordinator*  
Student Housing / UC DAVIS  
Office: 530-752-7098  
Cell: 530-681-0365  
Fax: 530-752-4345  
[jmbiederer@ucdavis.edu](mailto:jmbiederer@ucdavis.edu)
GARDEN AND GARDEN TOOL SAFETY

Gardening injuries can be prevented by following safe work practices. If you do not understand how to do something ask for help. No chemicals will be used on these raised gardens.

- Know your physical capabilities when working over raised garden beds. Stretching to far over and edge can cause you to fall. Know how to use the tools you will be using.
- Prior to work make sure you have all the protective clothing need for your work. A good set of gloves and eye protection will help prevent accidents. Gloves should fit correctly. Do not dig with your bare hands. Wear good solid closed toe shoes, not sandals to work in.
- You have to be careful in the hot weather not to get over heated. Drink plenty of water. Wear a hat with a brim to give you shade. Other considerations would be to wear long pants, long sleeve shirts and sunglasses if needed. And last but not least a sunscreen to help protect you from sunburn. Take frequent breaks in a shady area so you do not overheat yourself.
- Prior to use always make sure to inspect your tools for damage. You might look for cracks or splintered handles. Always make sure your tools are clean, sharp and in good condition. If you find a problem with your tools do not use them until they are repaired. Avoid using garden tools above shoulder height. Make sure the tool you are using is the correct one for the job you are doing. A square nosed shovel is used for lifting and moving loose material. A round blade shovel is used for digging and a garden spade for turning soil, transplanting and edging. A fan shaped rake is used for leaves and garden debris. Level headed rakes and used for grading and smoothing surfaces. Do not carry any tools in your pockets.
- Be aware of those working around you and look out for their safety also.
- Repetitive motion injuries occur when doing repetitive tasks without taking breaks or changing the chore you are doing.
- Stand with your back straight when working with long handled tools such as shovels, rakes and hoes. Protect you back by lifting with your legs not your back; this will reduce the chance of hurting your back.
- Horseplay is not permitted in the garden area.
- When finished with the area you are working on make sure you clean up the area before leaving; clean and properly store you tools.
- Personal Hygiene and sanitation is necessary when dealing with soils or composts that may be contaminated.

Any surface or implement that comes in contact with fresh produce could be a source of contamination with pathogens.
Tools should be cleaned after each use. Doing so keeps diseases, fungi, insect eggs, and weed seeds from being unwittingly spread around the garden. Cleaning also extends the life of a tool by removing moisture-laden, rust enhancing soil from steel surfaces. For tools with a keen edge, a good cleaning keeps rust from eating the edge away.

Spades, rakes, hoes, trowels, and any other tools that come into contact with soil should be hosed off with water after each use. With the garden hose nozzle adjusted for maximum pressure, average garden soil washes away easily. To remove heavy clay soil, some scrubbing with a hard bristle brush also may be necessary. After washing any tool, dry it with a cotton rag before putting it away. To reduce the potential for accidental transferring bacterial or parasitic organisms form feces or fecally contaminated soils, it is mandatory to isolate any tools used to collect/remove feces and fecally contaminated soils until the tools are properly cleaned and sanitized. Disinfecting tools can be done with a bleach and water mixture which will be stored with the tools.

Even after washing and drying, steel tool heads are still susceptible to rust when exposed to oxygen. In fact, as a general rule, the better the grade of steel used, the more vulnerable it is to rusting.

Before taking any kind of wire brush to a tool, always wear the proper Personal Protective equipment such as safety glasses and gloves. The rust particles or the wire bristles can fly off at high speeds and in unpredictable directions.

Sharpening tools is a slightly more complicated procedure than removing rust. The sharpening of tools will be completed by Student Housing Maintenance staff when required. Tools will be inspected by Joel Biederer of Student Housing on quarterly basis. Some tools like shovels, hoes, and trowels are best sharpened with a hand file, while other tools like pruning shears and knives call for a honing stone. Depending on how dull an edge is, some tools may require a session with a high-speed grinding stone.

It’s important to store your clean and sharpened tools properly.
GARDEN SLIPS, TRIPS AND FALLS

Prevention of falls in the garden workplace.

A fall occurs when you lose your balance and footing. One of the most common causes of falls is tripping over an uneven or wet walk surface. Bending over to far is also a hazard. Fortunately, these fall hazards are preventable. The following checklist can help stop a fall before it happens.

- Be sure the pathway is clear before you walk.
- Avoid excessive bending, twisting, and leaning backward.
- Do not leave garden tools laying in walkway.
- Pick up objects co-workers may have left on the floor.
- Do not over reach into a garden bed.
- Report uneven walkways.
- Never carry anything that obscures your vision.
- Wear stable shoes with non-slip soles.

If you find yourself heading for a fall, remember - **roll, don't reach**. By letting your body crumple and roll, you are more likely to absorb the impact and momentum of a fall without injury. Reaching an arm or leg out to break your fall may result in a broken limb instead.
BACK/LIFTING AND REPETITIVE MOTION INJURY

Planning
Proper lifting technique is critical to back safety, but perhaps more important is proper planning. Before you lift that box, or tool, or piece of equipment, take a moment to consider your action: How heavy is it?, where are you going with it?, what route will you follow? Do you need help moving it?

Think about where the item will be placed once you’ve lifted it - will it be overhead? Under an overhang? In a narrow spot? Try to allow yourself as much room as possible to set the load down. You can always shift it slightly later.

Check your path from place to place - remove tripping hazards. The shortest way isn’t always the fastest, or the safest.

Balance
As in life in general, moderation and balance are important considerations in care and maintenance of your back. You need the correct proportions of strength, flexibility, and overall quality of life to eliminate or minimize back injuries.

You need to exercise, eat right, and stretch as often as possible to help prevent injuries, and to recover more quickly if injured. In addition, a reduction in stress levels can help to relieve the muscle tension that can contribute to injuries. Remember that most back injuries can be attributed to one of these five causes: posture, body mechanics, stress, loss of flexibility and poor conditioning.

Repetitive Motion Injury
Also consider that not all back injuries are a result of sudden trauma - most are of a cumulative type, where a repeated minor injury has flared up, or continued use of a heavy tool in the same position has caused pain, or a great deal of time is spent in the same position. Bending over the raised garden beds can cause muscle strain. Repetitive motion injuries are easily avoided by taking frequent breaks and varying your type of work.

Technique
- Stand Close to the Load
- Grip Firmly
- Bring the Load Close to your Body
- Lift Head and Shoulders First, and With Your Back Straight, Use the Strength of Your Legs to Slowly and Smoothly Push Up
- Make Sure That You Can See Over the Load
- DON’T TWIST YOUR BODY. Torque Action Can Be Especially Dangerous. Move Your Feet First to Change Direction
- Bend Your Knees to Lower the Load
- Keep Your Fingers from Under the Load
- Lower Slowly and Smoothly
- When in Doubt, ASK FOR HELP!

Conclusion
Your back is the foundation and the structure upon which the rest of your body relies for balance and support. Used improperly, or unsafely, your back can suffer injuries that can literally change the way you live.

Acknowledgements: Construction Safety Specialists, Hartford Conn.
GARDENING ERGONOMICS

Ergonomic gardening tools are tools that are designed specifically to be comfortable and not make your hands sore after you are done using them. You must choose a tool that fits you and the job you are doing. Sometimes you can try different tools and positions to stop an ache that occurs. This is a huge benefit to gardeners because it means that you will be able to spend lots more time out in your garden without getting tired or sore. If your body starts to hurt stop doing what you are doing. Always work slowly and steady taking frequent breaks; all you need is a five minute break to make you feel better.

The higher the percentage of a person's strength that is required to perform a given task, the greater the risk of hurting yourself. There are a variety of factors that influence the amount of force that person can generate such as gender, age, and the type of gloves [yes - gloves! - if they fit too loose or are too thick, they can affect your grasp]. Using tools that are designed with ergonomic principles can go a long way toward reducing the likelihood of injury.

GOOD

Grip strength is at its maximum when the wrist is in a relaxed or "neutral" position like this.

BAD

Testing has shown that people lose up to 25% of their grip strength when their wrist is bent. The bent posture shown here, called an ulnar deviation, is the most potentially dangerous. The tendons responsible for flexing the fingers are easily irritated by exertions made while in this posture.

GOOD

Oversized "Molded" grips like this, are easy to grasp and hold, reducing hand fatigue because the wrist remains in a neutral position during use.

BAD

"Form-fitting" grooves, like this, only fit one size hand perfectly. People with larger hands will find that their fingers overlap the ridges, causing pain, soreness, and calluses. Those with smaller hands will have to spread their fingers to match the grooves. Strength testing has shown that this spreading of the fingers significantly reduces grip strength, requiring more pressure to maintain control of the tool.

GOOD

Stand up straight. If you have to bend, try to do so at the knees, not at the waist. If you can’t squat, find a way to sit. Add adjustable handles to long-handled tools so you don’t have to bend as much.

BAD

Stooping [bending over at the waist], rather than squatting.

Resources:  [www.handhelpers.com](http://www.handhelpers.com) - UC Davis ANR Environmental Health and Safety
HEAT STRESS SAFETY INFORMATION

When working in the garden and the heat increases, every effort must be made to prevent heat stress or stroke. Whether it is at home or here at work we need to take the time to be aware of some basic heat safety tips.

We need to be aware of what our bodies are telling us. Too often we receive information telling us that our body is having a difficult time and we don’t listen; until there is a body breakdown.

Heat stress injuries can include, heat rash, heat cramps, heat syncope (fainting), heat exhaustion and heat stroke.

Some signs that there is a problem might include any of the following: skin will feel cool and moist; confusion; weak pulse; heavy speech; weakness; fatigue; headache; and cramps.

To help prevent these problems you should:

- Get used to the heat in short periods, to acclimate to it.
- Wear a hat to shade yourself.
- Dress in lightweight, light colored clothing.
- Drink lots of water, even if you don’t feel thirsty. (A quart an hour).
- Take frequent breaks, preferably in the shade.
- Try to schedule work for early morning or late afternoon
- Do not drink alcohol or take cold medications.

If any symptom persists you should get medical attention.

Heat stroke is more severe than Heat Stress. Get medical attention immediately.

Signs of Heat stroke are:

- Mental confusion
- Loss of consciousness
- Convulsions
- Nausea
- Body temperature highly elevated
- Loss of coordination
- Cramps and hot dry skin

Be aware of those working around you and if any of the above symptoms occur have the person sit in the shade, give them water to drink and get medical help. Report it to your supervisor immediately.
INSECT BITES IN THE GARDEN ENVIRONMENT

Insect bites mostly look like little red bumps on your skin that are often itchy. They are the result of an injection of a foreign substance into your skin. The introduction of this foreign substance may trigger an allergic reaction, depending on the sensitivity of the person to that substance.

This foreign substance can come from either a venomous or a non-venomous insect. A venomous insect bites or attacks the person as a defense mechanism, injecting toxic venom into the person's skin to keep him away. Insects such as bees, hornets, and fire ants are classified as venomous insects. Non-venomous insects, on the other hand, feed themselves by injecting anti-coagulant saliva into your skin. These insects are mosquitoes, ticks, biting flies, and some spiders.

Mosquito bites usually are visible on a person's uncovered areas, such as hands, arms, legs, ankle, and the neck. They are easy to spot, as they swell easily. Flea bites mostly are visible in the ankle area and lower leg. They don't appear instantly but can become increasingly itchy after long hours. A spider bite literally is visible because you can see the bite mark in the middle of a visible swelling lump on the affected area of the skin. The skin's reaction also varies depending on the kind of spider.

The most common effect when the skin gets irritated from an insect bite is itching. This can be treated with any Benadryl lotion. It helps lessen the swelling and eventually reduces irritation. Another effect is stinging, which can be remedied just by placing a cold wet towel on the affected area of the skin. Others may have a serious allergic reaction to an insect bite. Face swelling, difficulty in breathing, fever, and even shock are the serious effects insect bites can cause.

If the swelling and stinging still persist, you may be having an acute allergic reaction to the bite and will need to see a doctor immediately.

Article Source: http://EzineArticles.com/?expert=Damian_Sofsian
PREVENT PLANT POISONING
- Know what plants are poisonous.
- Identify the plants in your home, garden and neighborhood. Take clippings to a plant specialist for identification and write down their names. Keep the list handy. Know if they are poisonous.
- Consult a plant specialist or call the Poison Center for suggestions about plants to avoid and plants to give as gifts.
- Do not make teas or home remedies from plants. Strengths of teas vary and it is easy to mistake a poisonous plant for one that is not poisonous. Many poisons are not destroyed by cooking.

What to do for a plant poisoning
- Remove any remaining plant parts from the mouth.
- If the victim is choking and cannot breathe, call 9-1-1.
- Otherwise, call the Poison Control Center.
- If you are advised to go to an emergency room for treatment, take the plant or a part of the plant with you. Do not take a single leaf or a single berry.
- If you are advised to go to a nursery to get the plant identified, keep in mind that plants are usually not very quickly digested, so there is time to get a correct identification. The correct name can result in the proper treatment to prevent symptoms from occurring if the plant was poisonous. If the plant was not dangerous, knowing the name can prevent needless treatment and worry.

Toxic Plants

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<th>TOXIC PART</th>
<th>SYMPTOMS</th>
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<td>Horseradish</td>
<td>Leaves</td>
<td></td>
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<tr>
<td>Potatoes</td>
<td>All green parts</td>
<td></td>
</tr>
<tr>
<td>Rhubarb</td>
<td>Leaf blade</td>
<td>Fatal. Large amounts of raw or cooked leaves can cause convulsions, coma, followed rapidly by death.</td>
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<tr>
<td>Tomato</td>
<td>Green parts (fried green edible)</td>
<td>cardiac depression</td>
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