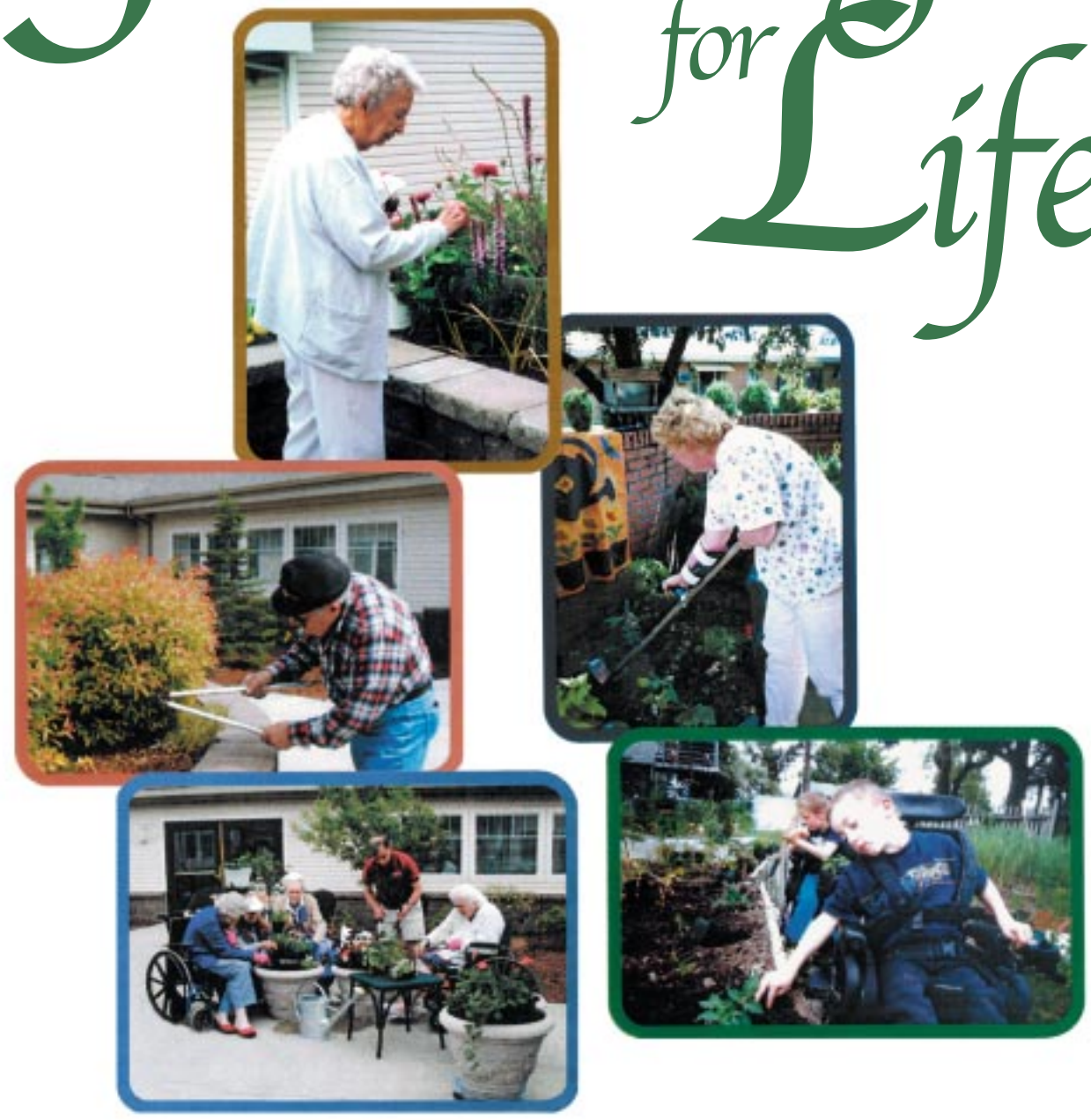
MISC0545

Gardening for Life



A Guide to Garden Adaptations

for Gardeners of All Ages and Abilities

Gardening for Life

A Guide to Garden Adaptations
for Gardeners of All Ages and Abilities

This booklet was produced by WSU Master Gardeners in Spokane County. Articles were contributed by members of the "Gardening for Life" committee: Becky Cresswell, Project Leader; Carol Schultz, and Christine Petrasso. Assistance was also provided by Kay Loibl, Karen Neubauer, Sister Eileen Neumann, Eberhard Schmidt, and Nancy Young.

The "Gardening for Life" committee can provide additional information on adaptive gardening in the form of workshops, presentations, and a portable adaptive tool display. Call (509) 477-2185 for more information.

You may order additional copies of this and other publications from the WSU Bulletin office, 1-800-723-1763, or online http://pubs.wsu.edu

Table of Contents

Introduction

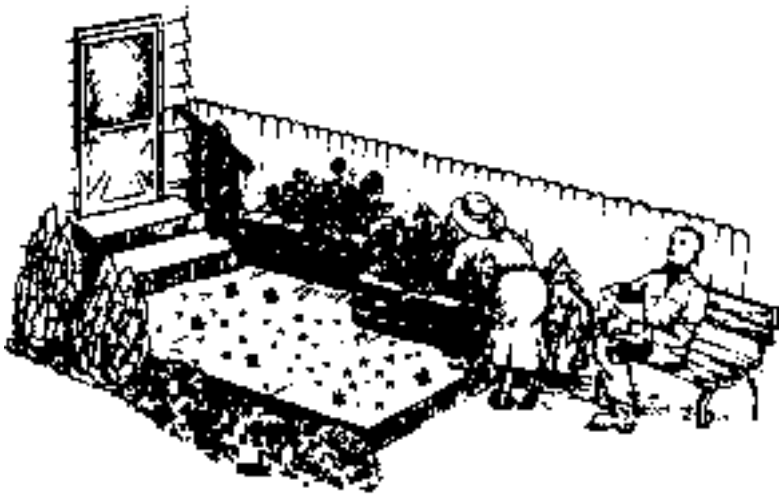
Most gardeners, novice and experienced alike, agree that gardening is good for the body, mind, and spirit.

We strengthen our bodies through gardening. We refresh our minds through the therapeutic benefits of connecting with nature and life. We renew our spirit through the quiet sanctuary of our gardens.

Along with the many pleasures and benefits come a myriad of physical tasks required to grow a successful garden. Completing garden tasks the traditional way is difficult for the gardener who is challenged by physical limitations. Some gardeners experience health conditions which cause decreased joint movement, muscle weakness, pain, or limited endurance. Others may live with vision or sensory limitations.

Identifying each gardener's individual needs and adapting his or her environment and gardening practices will assure that the capabilities of every gardener are maximized.

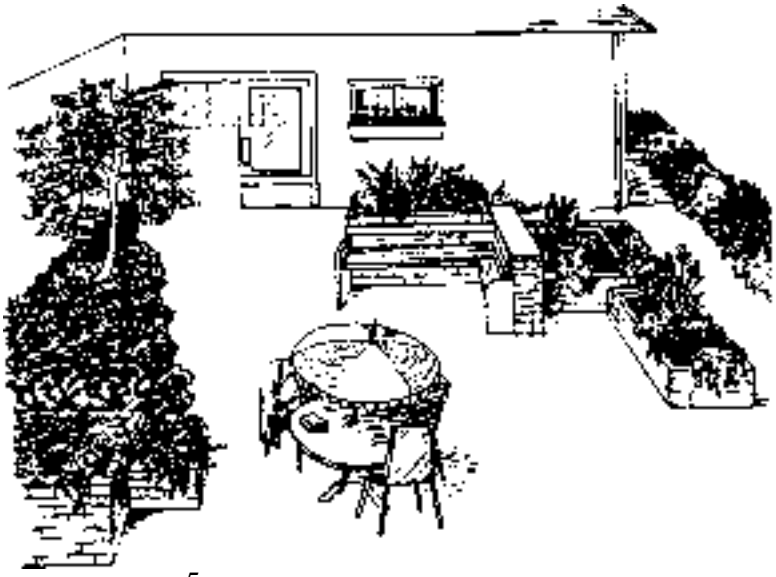
This booklet provides useful and practical information that will help gardeners of all ages and abilities learn healthy, life-long gardening practices. The information is designed to enable those with a love of gardening to continue throughout their lives.



Garden Design Considerations

General Design Tips

- Place garden beds near the house for quick accessibility.
- Place garden beds near a driveway to decrease the distance needed to bring supplies such as plants and soil to the garden area.
- Keep garden tools and containers within easy reach.
- Build tool shed doors at least 48 inches wide to accommodate wheelchairs.
- Provide pegboards and shelves at easy reach—measure from the floor to the top of the gardener's head for maximum height.
- Place garden beds close to an available water source.
- Use a large plastic trash container as a water source from which watering cans can be filled.
- Provide plenty of seating in the garden area.



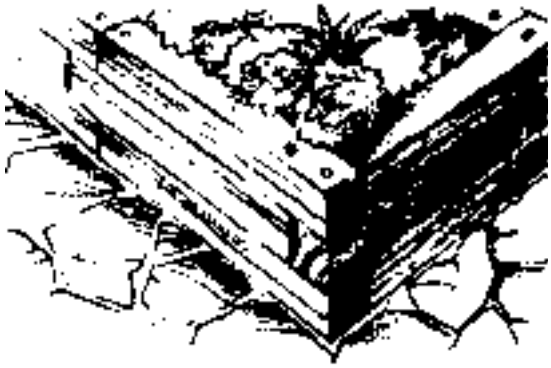
Raised Bed Gardening

Introduction by Christine M. Petrasso, WSU Master Gardener

Since I have twin boys in wheelchairs (because of cerebral palsy) who love to be "dirt diggers" and because of my own back problems, I really needed to build a raised bed of some sort. "Some sort" turned out to be a wheelchair accessible wood-sided raised bed 4 feet wide and 25 feet long. It's far from perfect, but it serves its purpose and the boys are great little beginning gardeners. This booklet is for them.

Building a raised bed isn't difficult, but it does take some degree of physical ability. Someone with severe physical limitations may need assistance. You also need to come up with a plan that includes, but is not limited to, the following factors:

1. The Person
2. The Place
3. The Plants
4. The Design

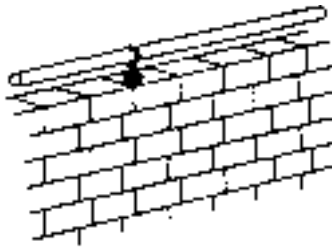


The Person

For the raised bed to be comfortable, functional, and accessible for the person with a disability, consider the following questions:

- Does he use a wheelchair?
- Does she primarily sit, but can walk for short periods of time?
- Is stumbling a consideration?

- Does the gardener use a walking aid such as a cane or walker?
- Will the person benefit from a grab bar?
- How far can the individual reach?
- Are the upper extremities, lower extremities, or both affected?
- Does the gardener have visual or other sensory limitations?

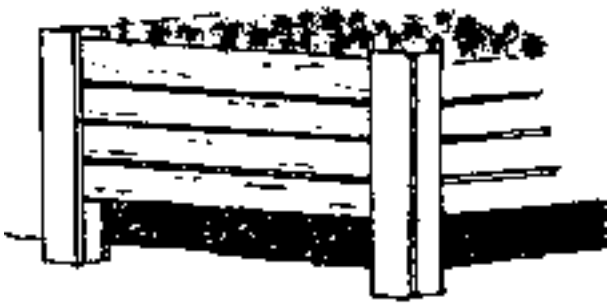


The answer to these questions will determine:

- The type, size, and location of bed
- The size and choice of material used for pathways
- The design of the bed
- Seating needs

Determine the height and width of the bed according to:

- The gardener's physical limitations
- The gardener's reach—bed width should allow the person to easily reach into the center of the planting area (48 inches is generally a comfortable width for a bed accessible from two sides).
- The approach
  a. For a face-on approach in a wheelchair, measure from the ground up to an inch above the knee for the height of the bottom of the planter. This allows plenty of legroom under the planter. If the bed is to be built on the ground, allow space underneath for feet and wheelchair footrests.



b. For a side-on approach, again consider the individual's physical abilities. Beds can be built to different heights in 6" increments.

- The type of plants grown—the gardener must be able to reach taller plants to tend them. (See Raised Bed Size Guide, page 80.)

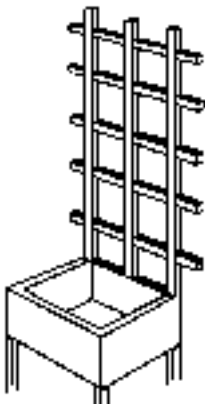
The Place

- Many plants, particularly vegetables, need at least 6 to 8 hours of sun a day.
- Protection from wind reduces water loss and plant breakage.
- For convenience, locate the bed as close as possible to a water source.
- Plan for hose storage, or consider installing a drip irrigation system or a sprinkler system, especially if the water source is at a distance.
- Provide easy access to and from the garden.
- Allow 4-foot wide pathways to provide clearance for wheelchairs, walkers, wheelbarrows, small carts, and tools.
- Plan for a nearby tool shed or storage building that will accommodate the gardener's limitations.
- Size—how much space is available, and how much garden can the individual manage easily?

The Plants

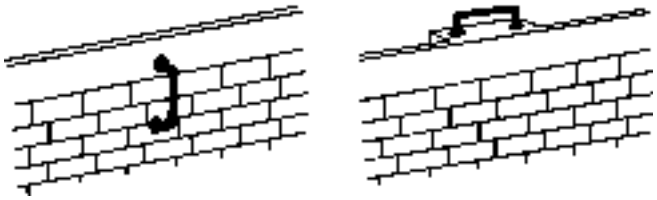
- Most plants grow well in raised beds as long as the preceding conditions have been met and there is adequate soil depth.
- Fit the size of the mature plants to the size of the raised bed.

- For limited vertical reach, grow dwarf or miniature varieties.
- For limited horizontal reach, grow vines and spreading bush-type plants.
- To grow tall plants, use trellises and stakes.



The Design

- Measure the site, the gardener, and any mobility devices to determine the height and overall size of the bed.
- If the bed is built directly onto the ground, slant the bottom of the bed inward to accommodate wheelchair footrests (i.e. 24" bed base to a 30" raised bed top).
- Add grip bars if the gardener has balance problems or tires easily. Provide accessible seating if balance or easy tiring is a concern.



- Padding for the knees is especially appreciated by those in a wheelchair.
- If the person takes medication that makes him/her sun-sensitive, place seating in the shade.

Building the Bed

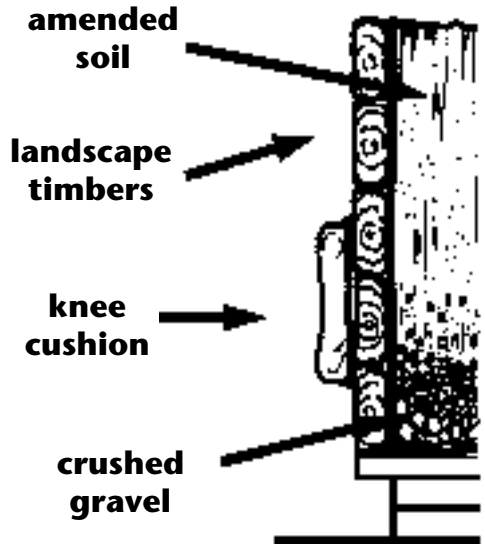
A raised bed can be built out of almost anything that hasn't been treated or used to store chemicals. This includes untreated but rot-resistant wood, brick, stone, clean garbage cans, 55-gallon drums (that have not been used to store oil or any other type of chemical),

wooden barrels, old bathtubs, or anything that accommodates the plants, space, and person. Raised bed kits can also be purchased from your local hardware/garden center store.

Choose the type of material used to build your sidewalls. If using wood, put the frame together with decking screws, which don't pull out as readily with the weight of the dirt. Stone, brick, or cement blocks should be cemented together and may be lined with plastic to reduce iron leaching from these materials.

After clearing away weeds, mark out pathways around the bed and construct the frame. If beds are 24 inches or more deep, the bottom third can be filled with rock or crushed gravel. This reduces the amount of soil needed to fill the bed.

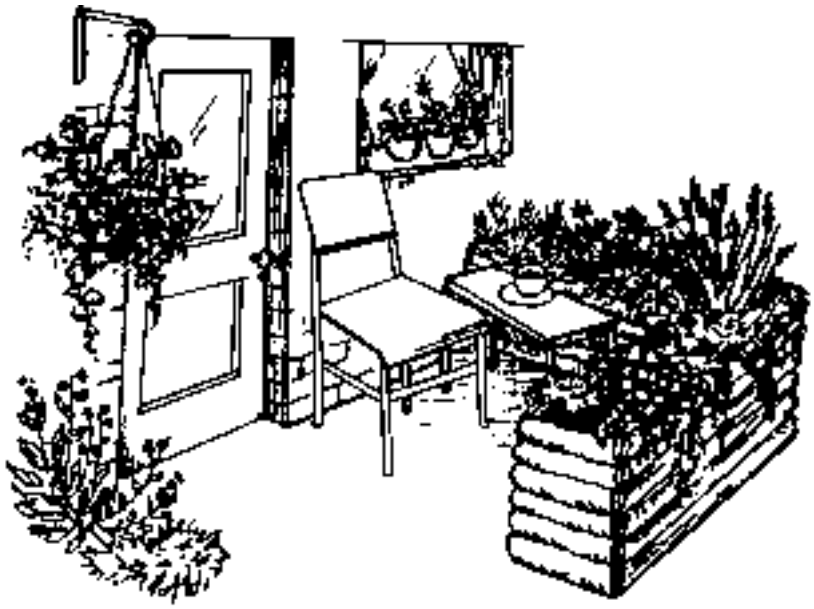
Cutaway View of Raised Bed



Fill the rest of the bed with amended topsoil. Good amendments from garden soil include compost, aged manure, peatmoss, or other organic matter. The "3-way" mix (soil, sand, and compost) sold by garden stores works well in raised beds. Fill at least 2 inches above the top of the sides to allow for settling.

Regardless of the soil mix used, the beds must drain freely, retain moisture, and be well-aerated and easy to work. Apply mulch after seedlings appear to help retain water and cut down on weed growth.

Whether growing vegetables, herbs, roses, annuals, perennials, or even shrubs or small trees, raised beds enable any gardener with limitations to adapt the garden to meet his or her needs. Even a small patio garden provides a space to enjoy the benefits and pleasures of gardening.



Garden Path and Ramp Construction

- Paths that will accommodate two wheelchairs should be a minimum of 7 feet wide.

- Pathways ending in a cul-de-sac or turnaround area should be at least 6 feet x 6 feet to accommodate wheelchairs.

- Ramps should not exceed a 5% gradient. For every foot of change in slope height, 20 feet of path is required.

- Keep surfaces of ramps nonskid by using textured concrete or roughened wood.

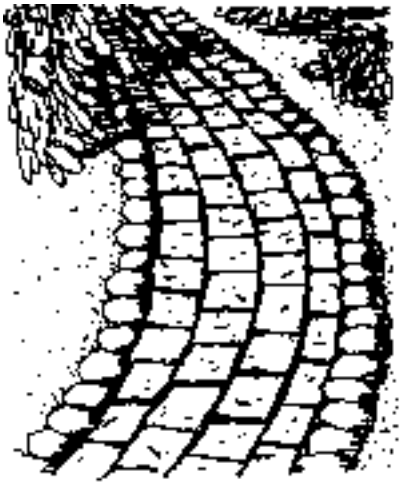
- Keep paths clean and free of standing water.

- Scrub surfaces periodically to remove buildup of algae and moss, which can make paths slippery.

- Install handrails where needed and provide adequate lighting.

- Avoid using grass and other soft materials for pathways. They are difficult for wheel chair wheels to roll on (see Hard-Surface Paving Options, page 81).

- Hard surfaces make negotiating paths easier for those with canes or walkers because tips cannot imbed into the path surface.



Container Gardening

Gardening in containers is ideal for the gardener who needs to sit or who has mobility limitations. It is also appropriate for the gardener who chooses to spend less time and energy on garden maintenance.

Tips for Gardeners With Limitations

- Within the individual's comfort range, place containers at varying heights to add interest in the garden area.

- For added safety, use containers stable enough to support the standing gardener, especially those who use assistive devices like walkers or canes. If the container is leaned upon it should not tip.

- If large containers are used, place them where you want them to remain before adding soil.

- Situate container plants away from walkways.

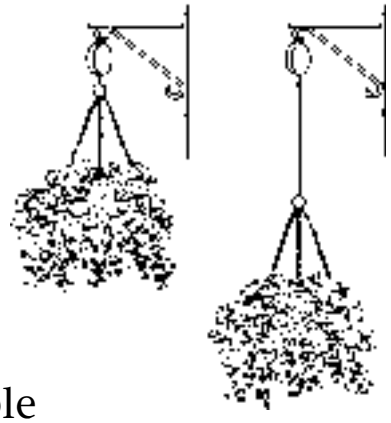
- Containers in bright colors add interest and are easier to see.

- Plant flowering annuals with similar cultural requirements in large containers to minimize maintenance.

- Gardeners who find sitting for long periods of time difficult may find hanging container plants ideal. The gardener is able to stand comfortably while completing gardening tasks.

- Use container caddies with wheels for easier movement.

- Hanging baskets suspended on a pulley system work well for wheelchair bound gardeners. The containers can easily be pulled down to a workable level.



- Planting bags are an easy way to grow plants. They are lightweight, portable, and can be suspended at a height comfortable for the seated or standing gardener.

General Tips for Container Gardening

Container

You may use nearly any container as long as it is deep enough to accommodate the root system of the plants you are using. Larger containers are better for vegetables. Wood, plastic, pulp, clay, metal, burlap, wire, and moss containers will all work. Whimsical containers can include such items as milk cans, old boots, coffee pots, pails, etc.

The containers must drain easily to prevent soil from becoming oversaturated. If the containers do not have holes, drill them yourself or use a plastic pot with drain holes inside the decorative container. In this situation, be careful not to overwater.

Soil

Always use potting soil in your containers. Do not use soil from your yard or garden. Purchase a bagged soil that contains organic material like peat or perlite or vermiculite (choose a product that does not contain asbestos). These amendments allow potting soil to retain moisture and maintain air space so roots grow quickly.

Water

Containers require more frequent watering than plants grown in the ground. This is especially true for hanging containers. Plan on watering at least once a day; more often during hot summer days.

Fertilizer

Plants obtain nutrients from the soil and water around their roots. In containers, nutrients need to be replaced during the growing season. You can use liquid, dry, or timed-release fertilizers.

Liquids: Liquid fertilizers are immediate, easy to mix and apply, and can be diluted to various concentrations to suit plant needs. You can use them once a month at full strength or every two weeks at half strength.

Dry Fertilizer: There are many to choose from. Follow the directions on the label. Water soil thoroughly both before and after applying dry fertilizers.

Timed-Release: Nutrients are released from the fertilizer a little at a time. Timed-release fertilizers such as Osmocote stay active for various lengths of time. Check label of product for best results.

Plant Suggestions

Plants for sunny locations: nasturtium, marigold, geranium, alyssum, lobelia, ivy, vinca, zinnia, aster, pansy, petunia, verbena, dusty miller.

Plants for shady locations: impatiens, begonias, lobelia, alyssum, ivy, vinca, pansy, coleus, fuchsia, browallia, dusty miller.

Vegetables: cherry tomatoes, lettuce, carrots, bush varieties of squash, onions, beets, peppers. Most herbs, with the exception of the very tall or large ones such as dill, do well in a container.

Vertical Gardening

Introduction by Kay Loibl, WSU Master Gardener

I would like to dedicate my love of gardening and my involvement in adaptive gardening to my mom and dad, Nina and Clair Lowder. They keep going, despite some physical challenges, in their golden years.

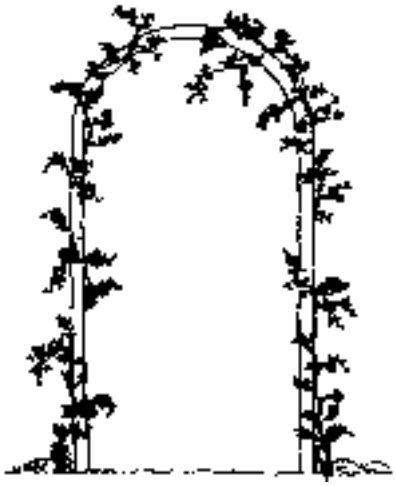
Fences, walls, arbors, and trellises can be used to support plants or to hang containers at an accessible working height. Vertical gardens also add growing area to small gardens with limited space.

- Plant vines and climbing plants on vertical surfaces to provide a wind barrier.

- Climbing plants can reduce glare or reflected heat from surfaces to make the garden environment comfortable.

- Vines grown on pergolas will provide shade in the garden area.

- Construct an arbor to span a pathway. Vegetables such as pole beans, cucumbers,

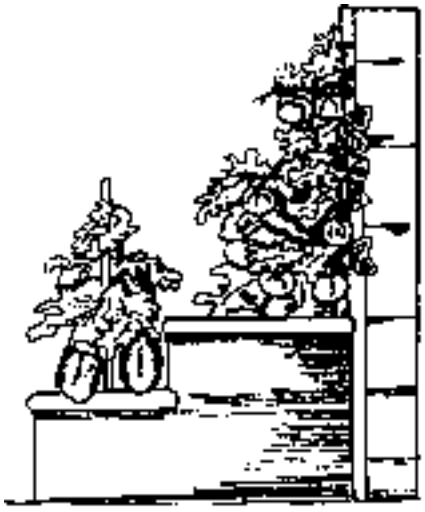


and snap peas can be planted on either side of the path and trained to grow up and over the arbor. Adjust the height of the arbor for harvesting from inside from a seated or standing position.

- Gardeners with limited mobility will enjoy learning to prune espalier fruit trees. They can be grown at an accessible level, which makes maintenance and harvesting easier.

- A sturdy shrub or small tree can be used as a trellis for flowering vines. Let the vines climb up through the branches.

- Use small trellises in containers to add extra, easy-to-reach growing space.



- Avoid using stakes that have pointed ends for trellises, which may be dangerous. Use rounded or circular supports to increase safety.

- Locate your vertical structures on the proper side of the garden to assure adequate sun for the specific plant.

- Place trellises on the downwind side of plants so prevailing winds will blow plants against their supports, not away.

Sensory Gardens and Plant Selection

Plants selected for a sensory garden stimulate the use of the five senses. This is especially important for the gardener who has impairment of one or more senses. Design an enjoyable garden area with plants that maximize the use of the other senses. Create spaces that provide interesting textural and visual displays, offer unique fragrances, and provide season-round interest.

Plants for Limited Vision

Bright colors in the garden are cheery and stimulating, while gardeners find subtle gradations in color more calming. Use plants with color contrast in foliage to add interest and beauty for the gardener with limited vision.

Annual	Scientific Name	Description
Coleus	*Coleus hybridus*	varying patterns—green, orange, red, pink on leaf
Marigold	*Tagetes hybrids*	bright yellow to orange flower
Zinnia	*Zinnia*	all colors, variegated petals, good cutting flower
Gazania	*Gazania rigens*	yellow to gold, brown centers, daisy-like, long bloom time
Garden Nasturtium	*Trapaeolum majus*	gold, yellow, pink to red blossoms, climbing or bush types
Sunflower		height 2–6 feet, light yellow, gold, brown

Perennial	**Scientific Name**	**Description**
Lamium	*Lamiaceae maculatum*	variegated foliage with pink or white flowers
Coral bells	*Heuchera* 	coral color, delicate blossoms, varying foliage
Hosta	*Hosta*	leaves green, blue, variegated
Purple Cone Flower	*Echinacea purpurea*	purple/pink flower
Maltese Cross	*Lynchnis*	bright red/orange flower
Oriental Poppy	*Papaver orientale*	many colors
Primrose 	*Primula polyantha*	spring flowering, many colors, fragrant

Shrub	**Scientific Name**	**Description**
Gold Flame Spirea	*Spirea x bumalda* "Goldflame"	flowers rosy red 
Garden Hydrangea	*Hydrangea macrophylla*	flowers pink, red, blue in large clusters
Dwarf Ninebark	*Physocarpus opulifolius intermedius* "Luteus"	yellow leaves in sun, yellow/green in shade
Red Twig Dogwood	*Cornus servicea*	bright red twigs give winter interest
Emerald 'n Gold Euonymous	*Euonymous fortunei* "Emerald 'n Gold"	broadleaf evergreen, gold edges on green leaves

Mt. Airy Fothergilla	*Fothergilla gardenii* "Mt. Airy"	leaves turn bright orange/red in fall
Tree	**Scientific Name**	**Description**
Japanese Maple	*Acer palmatum*	beautiful red fall color
Sunburst Honey Locust	*Gleditsia triacanthos inermis* "Sunburst"	bright yellow/green leaves in spring
Tri-color Beech	*Fagus sylvatica* "Roseo-Marginata"	green leaves marked white and edged pink
Vine	**Scientific Name**	**Description**
Climbing Roses	*Rosa*	many varieties—red, yellow, orange
Trumpet Creeper Vine	*Compsis radicans*	orange to orange/red flowers
Trumpet Honeysuckle	*Lonicera sempervirens*	showy orange yellow to scarlet trumpet flowers
Clematis	*Clematis jackmanii*	rich purple flowers

Plants for Fragrance

The sense of smell is the last of the senses to change as we age. Memories may be triggered by sniffing a fragrance experienced in childhood.

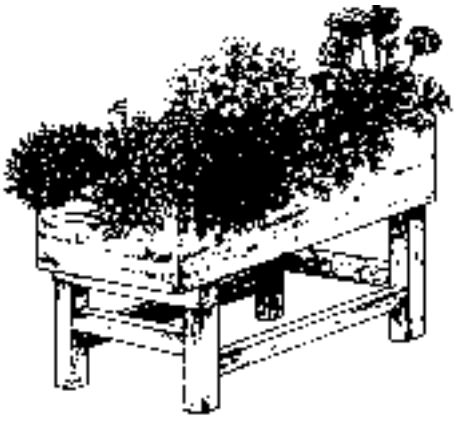
Place fragrant plants along pathways so they release their scents when brushed against. Some plants yield foliage or flower fragrance on a gentle breeze or by the heat of the sun.

Some plant scents can invigorate the gardener, such as lavender or rosemary. Others produce a tranquil mood from their heavy scent, like honeysuckle or wisteria.

Try some of these fragrant plants in your sensory garden.

Annual	**Scientific Name**	**Description**
Sweet Alyssum	*Lobularia maritima*	blue, white fragrant delicate flowers
Stock	*Matthiola incana*	many colors of flowers, spicy sweet smell
Heliotrope	*Heliotropium arborescens*	old fashioned, dark violet flowers with sweet delicate fragrance
Flowering Tobacco	*Nicotiana alata*	very fragrant flowers, open in evening

Perennial	**Scientific Name**	**Description**
Garden Phlox	*Phlox paniculata*	Lavender fragrant flowers
Lily-of-the-Valley	*Convallaria majalis*	very fragrant; be aware all parts are poisonous
Monarda	*Monarda didyma*	minty/basil-like fragrance
Lavender	*Lavender angustifolia*	distinctive fragrance
Lemon Balm	*Mellissa officinalis*	tangy lemon scent
Mint	*Mentha speciosa*	also orange, pineapple, and apple scent
Pinks	*Dianthus*	spicy fragrance
Sage	*Salvia officinalis*	fragrant
Sweet Woodruff	*Galium odoratum*	sweet hay-like scent
Scented Geranium	*Pelargonium*	many scents—lemon, rose, lime, and apple



Shrub	**Scientific Name**	**Description**
Peony 	*Paeonia*	white, pink to red flowers, fragrant
Butterfly Bush	*Buddleia davidii*	fragrant flowers, attracts butterflies
Daphne	*Daphne odorata*	fragrant flowers
Common Lilac	*Syringa vulgaris*	fragrant spring flowers
Rose	*Rosa* 	many types, colors, and fragrances
Sweet Mock Orange	*Philadelphus coronarius*	very fragrant late spring flowers
Common Witch Hazel	*Hamamelis virginiana*	spicy scent

Vine	**Scientific Name**	**Description**
Sweet Pea	*Lathyrus odoratus*	fragrant flowers
Moon Flower	*Ipomoea alba*	fragrant flowers
Trumpet Honeysuckle	*Lonicera sempervirens*	fragrant flowers
Wisteria 	*Wisteria sinenses*	fragrant flowers

Plants for Touch

A great part of the pleasure we receive from gardening comes from experiencing different textures on stems, leaves, and petals. The feel of fuzzy leaves, peeling bark, silky petals, and velvety stems add an exciting dimension for the gardener in the sensory garden.

Annual	**Scientific Name**	**Description**
Cockscomb	*Celosia cristata*	velvety, fan-shaped flower clusters
Rabbit Tail Grass	*Lagurus ovatus*	very soft, fuzzy flower spikes
Statice	*Limonium*	many colors, papery dry flowers
Strawflower	*Helichrysum bracteatum*	papery flowers, many colors, excellent dried flower
Globe Amaranth	*Amaranthus*	round red/pink papery flowers
Fountain Grass	*Pennisetum setaceum*	grass-like texture, fuzzy flower spikes
Perennial	**Scientific Name**	**Description**
Lamb's Ears	*Stachys byzantina*	very soft, velvety gray/ green foliage
Wooly Thyme	*Thymus pseudolanuginosus*	fragrant, wooly flat mat
Silver Artemesia	*Artemesia caucasica*	soft, gray/green mound

Perennial	**Scientific Name**	**Description**
"Autumn Joy" Sedum	*Sedum telephium*	succulent, thickly textured leaves
Gayfeather	*Liatris spicata*	feathery, purple flower spikes
Shrub	**Scientific Name**	**Description**
Staghorn Sumac	*Rhus typhina*	branches covered with velvety short brown hairs
Golden Nine Bark	*Physocarpus opulifolius* "Dart's Golden"	bark peels and flakes
Holly	*Ilex*	thick, leathery, green leaves with marginal spines
Tree	**Scientific Name**	**Description**
Paper Bark Maple	*Acer griseum*	papery, exfoliating bark
River Birch	*Betula nigra*	mature tree forms bark that flakes and peels, cinnamon brown color

Plants for Taste

Satisfying the taste buds is one of the best rewards of gardening! A variety of herbs, vegetables, and fruits offer many combinations of sweet, sour, bitter, and salty tastes. Try edible flowers for an added taste treat to salads. Plant a large strawberry pot in spring to bring fruit, fragrance, and color within easy reach in the sensory garden. *Don't plant edible plants where pesticides might be used!*

Edible Flowers	**Scientific Name**	**Description**
Nasturtium	*Trapaeolum majus*	edible, spicy taste
Violet and Pansy	*Viola*	edible
Marigold	*Tagetes hybrids*	edible

Herbs	**Scientific Name**	**Description**
Basil	*Ocimum basilicum*	culinary herb
Sage	*Salvia officinalis*	culinary herb
Thyme	*Thymus vulgaris*	culinary herb
Marjoram	*Origanum majorana*	culinary herb
Tarragon	*Artemisia dracunculus*	culinary herb
Parsley	*Petroselinum crispum*	culinary herb
Oregano	*Origanum hirtum*	culinary herb

Fruits	**Scientific Name**	**Description**
Melons	many varieties	sweet to taste
Strawberry		sweet to taste

Vegetables

Many kinds with varying tastes

Plants for Sound

The sounds of nature in the garden can create subtle moods. The graceful leaves of ornamental grasses rustling in a breeze, bees buzzing, and the sound of bird activities provide a sense of serenity and excitement.

Introduce other pleasant sounds with running water, wind chimes, fountains, and wind socks. The gardener will enjoy experimenting with these features to create unique sensory garden environments.

Plant	**Scientific Name**
Ornamental Grasses	many varieties

Wind moving through leaves produces soothing sounds

Quaking Aspen Tree	*Populus tremuloides*

Not recommended for home landscapes but good for rural area; leaves produce soft clicking sound with wind

Chinese Lantern Plant	*Physalis alkekengi*

Perennial, produces loose papery lantern-like fruit, moves with wind

Money plant	*Lunaria annua*

Old fashioned annual, produces translucent silvery circles that stay on flower stalks, flutter in wind

Garden Safety

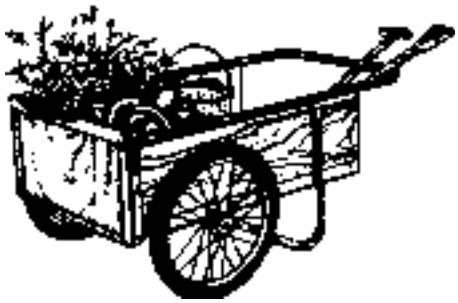
Physical Activity

Introduction by Cinde Johnson, Extension Coordinator

I'll never forget the part gardening played in my parents' lives. My dad discovered vegetable gardening after he retired. Luckily for him, the neighbors forgave him for having a truckload of chicken manure delivered, even though the "scent" filled the air for weeks afterwards! My mom gardened throughout her life, even when the only plants she could manage were begonias on her balcony and African violets in the living room. This booklet is in their memory.

Tips to Avoid Injury for the Ambulatory Gardener

- Avoid lifting objects that are awkward or too heavy.
- If it is necessary to lift an object, face the object and stand close to it before lifting.
- Bend both knees, keep the back straight, and squat down by the object to be lifted.
- Use the large leg muscles to help lift, not the back muscles.
- Use carts and wheelbarrows to move objects whenever possible.



- Lift objects smoothly, slowly, and without jerking.

- Do not twist at the waist—instead, shift feet when turning with an object.

- Avoid reaching overhead with both arms and looking upward, which can cause back strain.

- Avoid a long reach to pick up an object.

- Bend knees as you dig—this allows the large muscles in the legs to be put to work.

- Bend from the hips, not the waist, when hoeing, digging, or planting from a standing position.

- Use a low footstool to alternate resting of each leg when prolonged standing is necessary.

- Wear comfortable, protective shoes.

- When stepping down from a height of more than 8 inches, step down backwards, not forward, to avoid slipping.

- For gardeners with one-sided leg weakness, extend the strongest leg first when walking up slopes.

Tips to Avoid Injury for the Seated Gardener

- Seated gardeners should work at a height comfortable for their work area (see Raised Bed Gardening, page 6).

- Keep knees slightly higher than the hips to decrease stress on back.

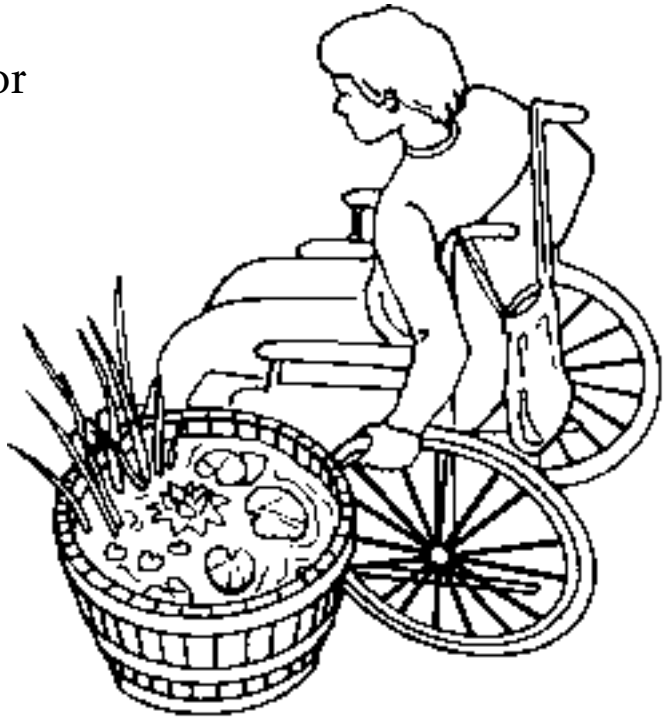
- Provide adequate foot rests for wheelchair users.

- Use lumbar cushions in chairs to provide support for the lower back.

- Arrange the work area to minimize excessive bending, reaching, and twisting at the waist.

- Use extended handle tools to avoid bending (see Adaptive Tools, page 43).

- Keep hoses on elevated reels for easier use.



Tips to Avoid Fatigue

- Provide sitting areas at regular intervals around the garden.
- Design garden beds at a convenient level to sit and work instead of bending to reach beds.
- Garden early in the day when temperatures are lower and you are fully rested.
- Avoid doing several heavy tasks in one day—prioritize tasks.
- Alternate a task with a rest period.
- Stretch muscles occasionally and change positions at regular intervals.
- Carry a portable phone, bell, or whistle to summon help if an injury occurs.

- Prior to gardening, warm up muscles with light stretching exercises to help avoid muscle strain (see Garden Warm-Up Exercises, page 37).

Tips to Avoid Over-Exposure

Introduction by Sister Eileen Neumann, WSU Master Gardener

This booklet is gratefully dedicated to those of us who find ways of gardening, in which we can still do what we love and find pleasure in at any time of our lives. To grow a garden or plant a flowerpot gives us a gift from the Almighty to share with anyone who passes our way. Gardening is one way we share in God's gift of creation.

- Take frequent rest periods in the shade to avoid over-heating.
- To prevent dehydration, keep a plastic fluid container near the rest area and drink at least 8 ounces of fluids (preferably water) every hour when gardening in warm temperatures.
- Use sunscreen and wear UV-protective sunglasses.
- Wear a sun hat with a wide brim to protect face and neck.
- Dress in light fabrics with long sleeves to avoid sunburn and protect fragile skin against abrasions.

- Gardeners on medications may be at higher risk for photosensitivity reactions when working in the sun—check with your doctor or pharmacist.

Garden Warm-Up Exercises

Warm-Up/Cool-Down Exercises

Before beginning gardening activities, perform five to ten minutes of slow, rhythmic stretching and low-intensity exercises. During this warm-up exercise time the heart rate, body temperature, and blood flow to the body's muscles will increase gradually. This will help prevent stiffness, soreness, and even injury. Gardeners with health concerns should consult a physician before starting a new exercise program.

Try the following exercises while sitting:

Neck

Roll your head gently from side to side. Look to the far right, then to the far left, again holding each position for five seconds.

Touch your chin to your chest and hold for five seconds. Tilt head backward to look at the sky and hold for 5 seconds.

Shoulders and Upper Back

Lift your shoulders up as high as you can (as if shrugging), hold for five seconds then lower them as far as you can and hold. Repeat five times.

Wrists

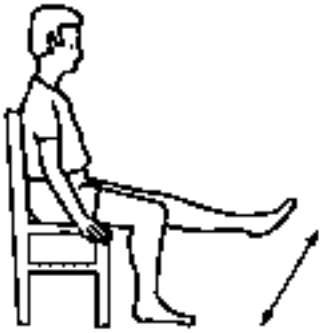
Make your hands into fists. Rotate your wrists in circles clockwise, then counterclockwise. Repeat five times in each direction with both wrists.

Back

Start by placing a footstool under your right foot. With both arms, gently reach towards your toes. Place your left foot on the stool and reach toward your toes. Repeat each stretch five times.

Abdomen

Sit straight in the chair. Take a deep breath in through your nose, then slowly exhale through your mouth as if blowing out a candle. Feel the stomach muscles flatten as you blow out. Hold stomach muscles tight after blowing out, then relax. Repeat the sequence five times.

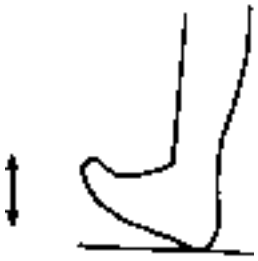


Legs

Sit upright with your knees bent and your feet flat on the floor. Raise one foot up and extend your leg fully. Lower the foot slowly to the floor. Repeat five times with each leg.

Hips

Place both hands on the front part of your right knee. Raise the knee as close to your chest as possible. Hold the position for a few seconds, then lower your knee and place your foot back on the floor. Repeat the movement with each knee five times.



Ankles

Place your legs shoulder width apart. Raise the toes on your right foot off the floor as if tapping to music. Do the same with your left foot. Repeat ten times with each foot.

Feet

With both feet flat on floor, raise the right heel (leaving all five toes on the floor). Hold the position for five seconds. Alternate by raising the left heel and hold for five seconds. Repeat ten times with each heel.

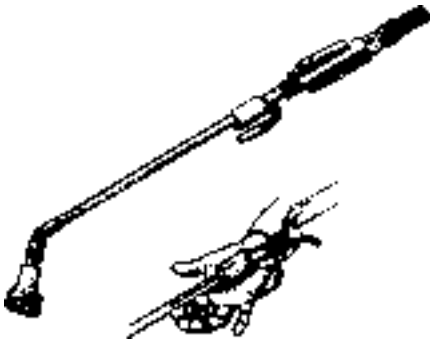
Cool-Down

Following garden activities, spend three to four minutes performing gentle exercises to cool down the muscles to a resting state. This will prevent dizziness and allow the heart rate to return gradually back to normal.

Adaptive Tools and Devices

General Information

Gardening can be physically demanding when it requires digging, lifting, bending, and kneeling. For people with physical problems, such as loss of strength or mobility, it takes ingenuity to reduce the pain that can result from what should be a pleasurable pastime.

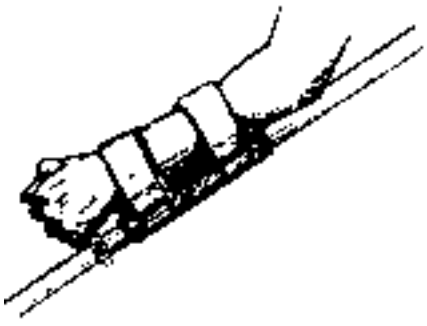


In recent years, industry has responded to the needs of gardeners by adapting favorite tools to make them easier to use. Some gardeners prefer to adapt the tools they have used over the years. Each gardener must decide which is best for his or her own needs.

Tips for choosing adaptive tools

(*see Product Guide, page 53)

- Choose from the wide range of hand tools now available. Trowels, weeders, and forks come with soft ergonomically sound handles, which are less painful for the gardener with arthritis or carpal tunnel syndrome.



- Try products which modify the handles of long tools, such as a D-grip type or T-grip attachment.*

- Hand tools which locate the grip upright are good choices for gardeners with weak wrists.*

- Hand tools with a detachable arm support can be used by gardeners with weak arms.

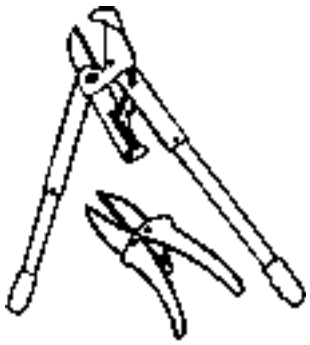
- For gardeners who need to sit, hoes, rakes, and trowels are available with lightweight telescopic or extendable handles that expand to 18 inches. These same extendable tools are great for ambulatory gardeners who find regular-length tools uncomfortable.*

- An added feature of the telescopic tool is the universal handle that extends from 25 to 41 inches and includes a soil and fan rake, crevice weeder, and trowel.*

- Another good alternative for seated or small gardeners are children's size garden tools.* Adapting the wooden handles of long tools may also be a good option.

- Other helpful tools are the soft touch, long-arm grippers for picking up litter without bending over.*

- Specialized pruners are available that hold the blossoms after cutting, to eliminate bending.*



- For gardeners with decreased hand strength, hand pruners and standard pruners can be almost impossible to use for any length of time. If the problem is not severe, consider using a smaller pruner or a rotating blade pruner that uses less effort.

- The larger ratchet-type pruners have fiberglass handles. They are lightweight and allow the gardener with little hand strength to prune. These also are available in right- or left-handed models. Several brands are endorsed by the Arthritis Society because of their small size and ease of operation.*

- Gardening involves getting close to the soil. For many, this can be a painful experience without the help of special aids. Kneepads can help while kneeling, or a cushion can be used and moved throughout the garden.*

- For gardeners who need help getting up, reversible kneelers are useful. They are padded for kneeling but have arms that can be used for lowering the body or for pushing up to a standing position.*

- Several manufacturers have produced sturdy stools on wheels for sitting while doing garden tasks in either regular beds or raised beds.*

- For those who are more comfortable sitting, a lightweight chair that can be moved around the garden easily can be very helpful.

- For a person using a walker in the garden, a simple bicycle basket attached to the front provides a place to carry plants or tools.

- To minimize walking and bending, wear a fisherman's vest or apron to carry around hand tools.

- Use a luggage or grocery cart or a golf bag to move equipment and tools that cannot be carried easily.

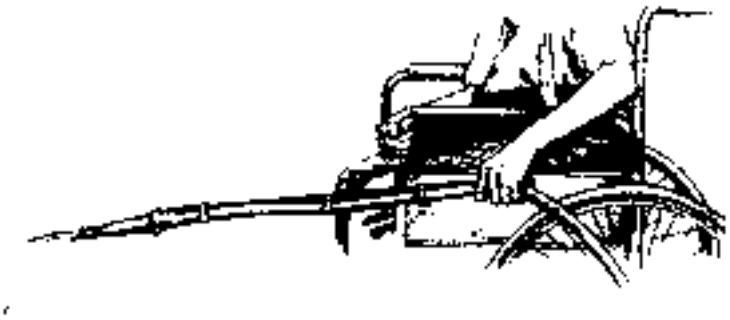
- Using garden carts to carry mulch, fertilizer, or other heavy objects can prevent back strain.*

- Use carts that will double as seats for gardening.*

- For easier watering use extensions that bring water to the container or bed.

- Lightweight hoses or coiled hoses that stretch to a 50-foot length are ideal for indoor plants and containers.*

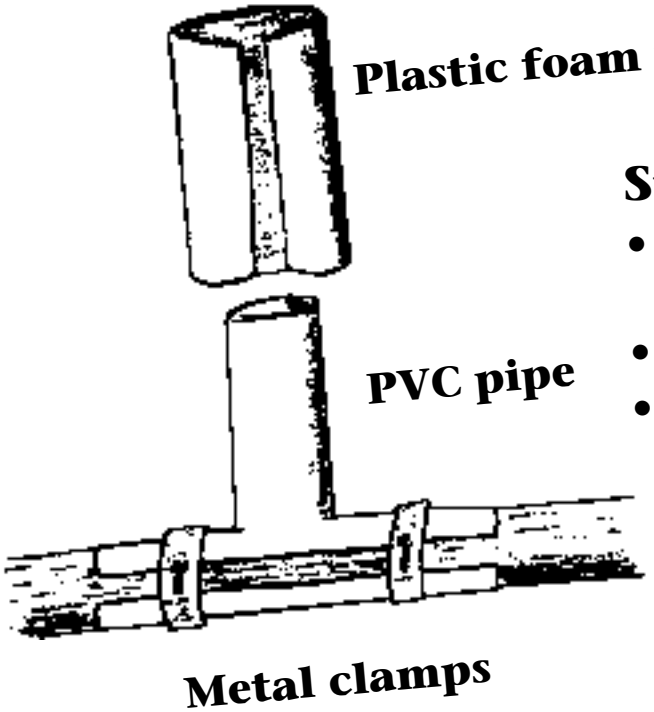
- Hose supports can be purchased or easily constructed by fastening a length of broom handle to the end of a garden hose.



Instructions for Adapting Tools

Upright Tool Grip

Add an upright grip to your existing hand tool or long-handled garden tool to improve leverage and decrease wrist and hand strain.



Supply List:

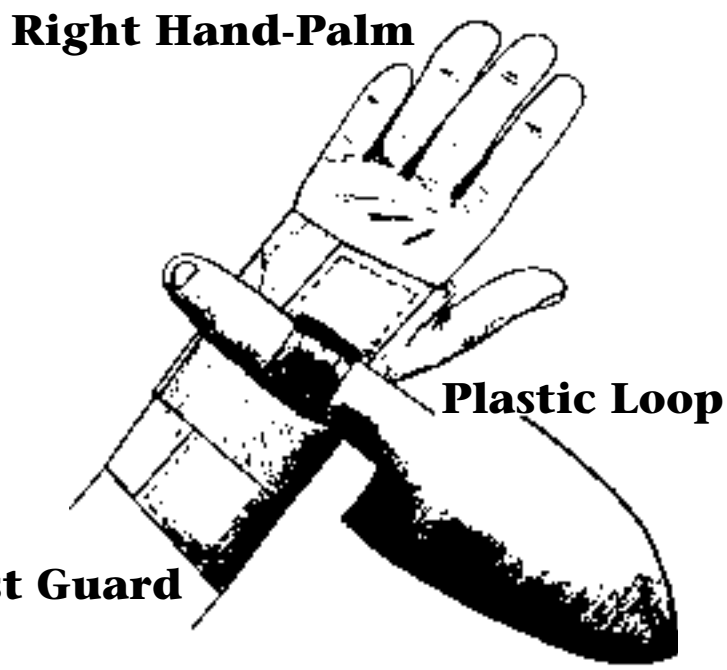
- PVC T-connector—sized to fit around tool handle
- 2 metal clamps
- Plastic foam pipe insulation

Instructions:

1. Cut PVC connector lengthwise.
2. Place upright extension of "T" on top of tool at a distance comfortable for the user.
3. Place other side of tool handle on bottom of tool handle.
4. Open clamps around pipe and handle and tighten securely.
5. Optional—place plastic foam pipe insulation over PVC grip to soften and enlarge grip, then secure with duct tape.

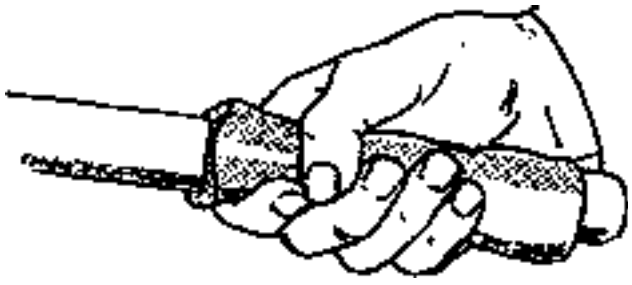
Tools for Gardeners with Grip Limitations

Convert any size wrist guard into a tool support for gardeners with severe limitations in gripping. Look for the type of guard that has a rigid plastic loop inserted on the palm side. A tool handle can be inserted through this loop. This works well for left or right handed gardeners.



If weak fingers are a problem, slide one hand through a cup with a large handle to scoop up dirt or dip water out of a bucket. The handle keeps the cup on the hand.

For less severe grip limitations, one of the simplest and least expensive ways to adapt tools for a more comfortable grip is to cover hard plastic or wooden handles with foam pipe insulation.

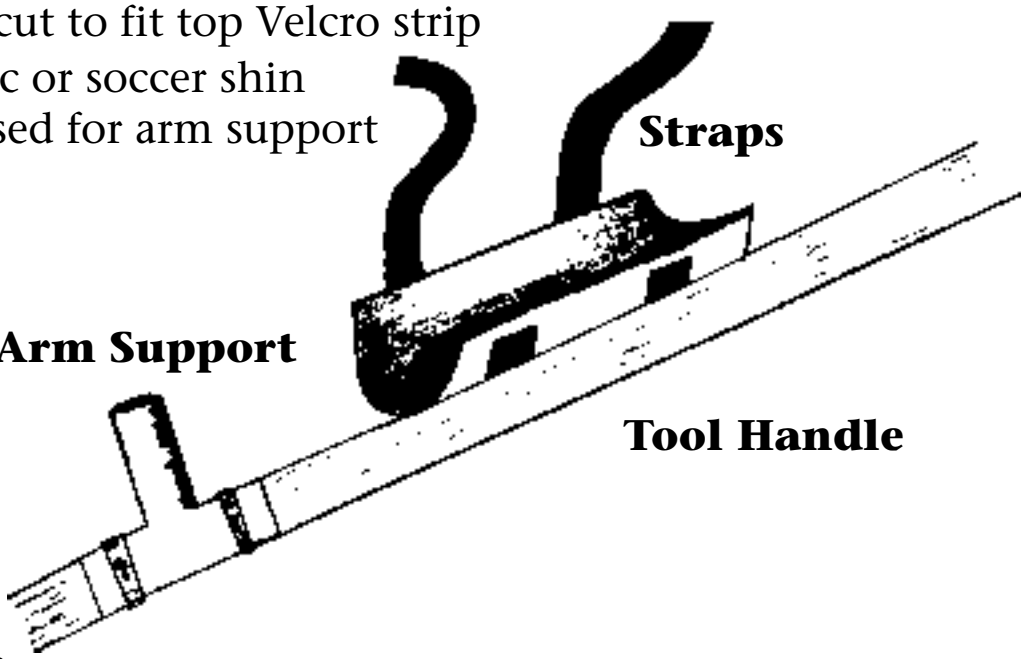


Tool Arm Support

Adding an arm support to tool handles gives extra support.

Supply List:

- Industrial-strength Velcro with adhesive backing
- Soft material cut to fit top Velcro strip
- Molded plastic or soccer shin guard to be used for arm support
- 3 screws

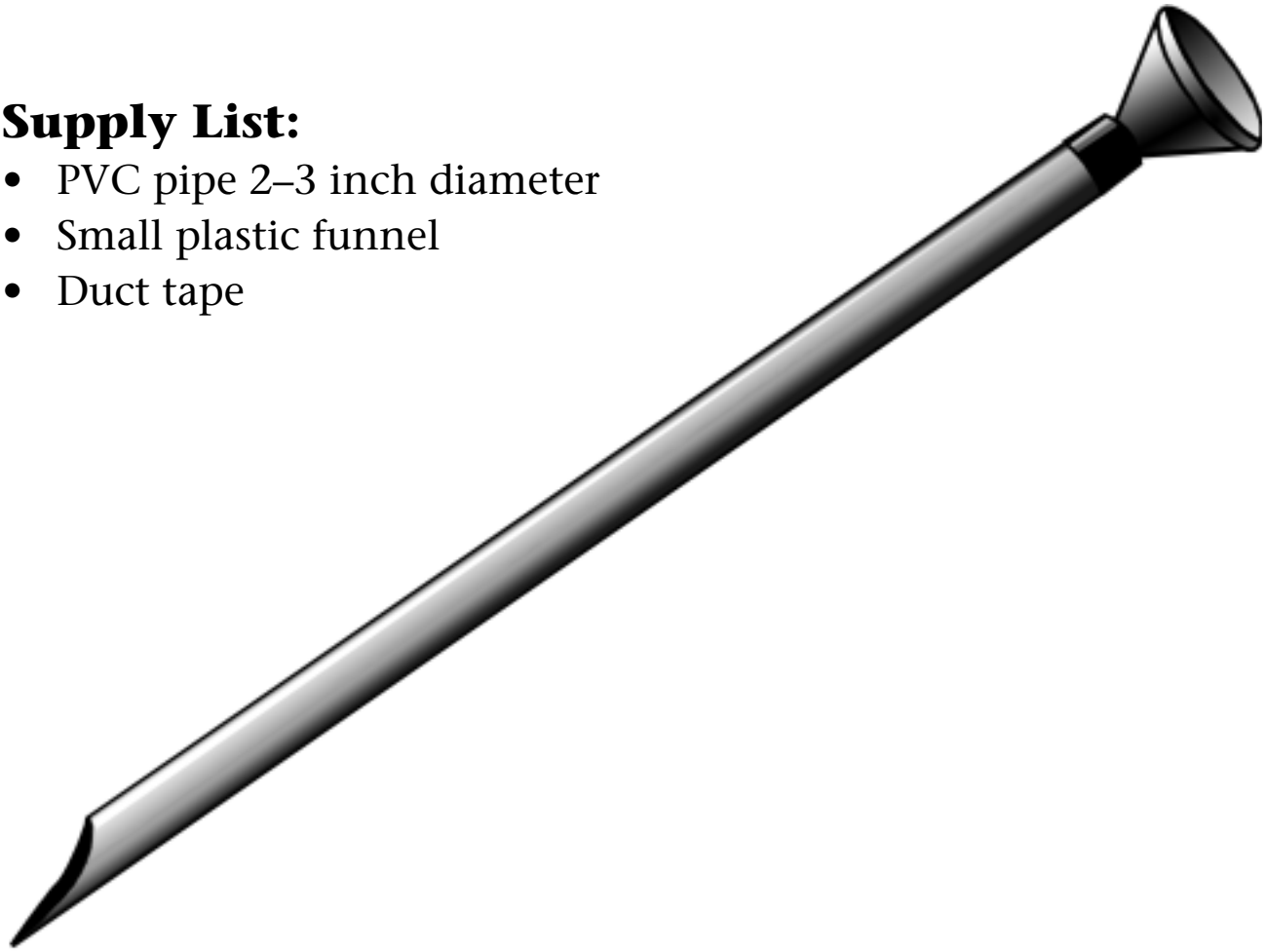


Instructions:

1. If using shin guard, cut off any elastic or straps, leaving only the molded plastic to be used for arm support.
2. Evenly place two rectangles (approximately 2x3 inches) of Velcro, adhesive side toward arm support, on right and left side of shin guard.
3. Screw arm support to wooden handle of tool in three places, centered on bottom.
4. Cut fuzzy Velcro long enough to wrap over user arm and attach to each Velcro strip on each side of arm support.
5. Cut soft material to fit fuzzy length of Velcro above.
6. Cover adhesive side of Velcro above with material.
7. Attach fuzzy side of Velcro to previously placed Velcro strips on one side of arm support.

Standing Seed Planner

Construct this planting device that allows the gardener to plant seeds without bending. The slanted end can be used to draw a furrow. Drop seeds at regular intervals through funnel to provide the seed spacing. To cover furrow, turn pipe over and drag along soil.



Supply List:

- PVC pipe 2–3 inch diameter
- Small plastic funnel
- Duct tape

Instructions:

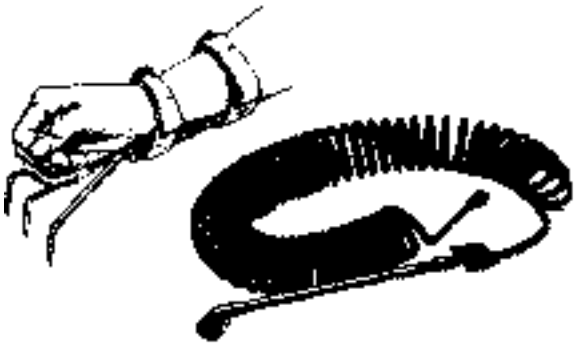
1. Measure length to user's waist while standing.
2. Cut PVC to this length at sharp angle.
3. Attach small funnel at other end, securing with duct tape.

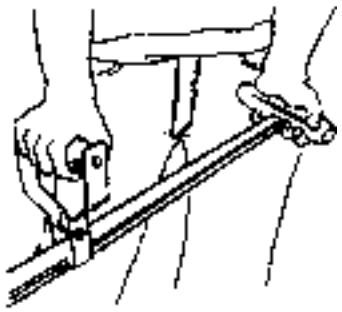
Product Guide

Product	Product Feature	Supplier
Not Stooped Garden Tools	Kits for modifying existing garden tools	Not Stooped Garden Tools
Down-Up Pulley	Helps raise and lower hanging garden containers for easy reach	Charley's Greenhouse Supply
Gorilla Grips D-Grip Bar Grip	Add-on grips to tools help reduce back strain and wrist strain	Charley's Greenhouse Supply
Power Gear Pruner	Leveraged gear action to increase cutting strength	Charley's Greenhouse Supply
Earth Bud-EZE	Hand tools give maximum leverage with upright grip and flexible arm cuff	Charley's Greenhouse Supply
Deluxe Ratchet Pruner	Ratchets to next power level for less stress to wrist and hands	Charley's Greenhouse Supply
Gardener's Wrist Wrap	Reduces wrist stress by maintaining proper alignment	Charley's Greenhouse Supply
Charley's Cut-N-Hold Pruner	Holds stem after cutting	Charley's Greenhouse Supply

Product	Product Feature	Supplier
Sure Grip Tools	Ergonomic designed hand tools—upright grip	Gardenscape's Enabling Tool Page
Telescopic Tools	Lightweight—extends reach to comfortable length	Gardenscape's Enabling Tool Page
E-Z Reacher Pick-Up Tool	32-inch grabber tool	Gardenscape's Enabling Tool Page
Fiskars Nyglass Hand Tools	Very lightweight ergonomic design	Gardenscape's Enabling Tool Page
Gardeners Knee Pads	Thick padding to protect when kneeling	Gardenscape's Enabling Tool Page
Carry-On Walker Bag Economy Walker Bag	Easy attachment to walkers—pockets allow for easy transport of tools	Functional Solutions
Fiskars Soft Touch Scissors	Spring loaded to open gently after every cut	Functional Solutions
Fist Grip Tools and Add-On Handles	Upright grip and optional arm support—ergonomic add-on upright handles for hand tools and long tools	Gardenscape's Enabling Tool Page
Good Grips Hand Tools	Soft handle with grip that molds to grip	Access With Ease

Product	Product Feature	Supplier
Scoot'N'Go	Scooter is 11 inches above ground with padded seat and extra storage space	Access With Ease
Hand Rake	Mini lightweight rake is 6 3/4 inches long, good for raised bed gardening	Access With Ease
Corona Extendable Handle Tools	Extends reach to comfortable range	Gardener's Supply
Universal Telescopic Tool Set	Handle extends 25–41 inches with universal handle	Lee Valley Company
Indoor Watering Hose	50-foot self-coiling hose attaches to faucet, water wand with off-on trigger	Lee Valley Company
The Stand Up Garden	Raised beds on wheels	Stand Up Gardens
Garden Gals Pruners	Small size allows for easy operation	GP Tools





Adaptive Tools Manufacturers List

Access With Ease
PO Box 1150
Chino Valley, AZ 86323-1150
1-800-531-9479

Charley's Greenhouse Supply
1-800-322-4707
www.charleysgreenhouse.com

Functional Solutions
North Coast Medical, Inc.
18305 Sutter Blvd.
Morgan Hill, CA 95037-2845
1-800-235-7054
www.ncmedical.com

Lee Valley Tools Ltd.
1-800-871-8158

Garden Gals Tools
1-888-GPTools
www.gardenpals.com/Garden_Tools.htm

Garden Supply Company
128 Intervale Rd.
Burlington, VT 05401
1-800-444-6417
www.gardeners.com

Gardenscape Enabling Tools Page
www.gardenscape.on.ca/pages/enablingtools.htm

Stand Up Gardens
1-800-To-Stand
www.standupgardens.com/gardens.html

Gardeners With Special Needs

Gardening Strategies for Limited Endurance

Many people experience limited endurance due to chronic health conditions such as heart and lung disease, diabetes, or chronic conditions such as multiple sclerosis or cerebral palsy. Those with limitations can continue to benefit from and take pleasure in gardening through modification of activities that aid in energy conservation. This guide offers tips to help gardeners with limited endurance learn energy-saving gardening strategies.

- Begin garden activities with warm-up exercises to limber the muscles and bring the heart rate up gradually. Warm-up exercise will help prevent and reduce strains, muscle pulls, and soreness. (See Warm-up Exercises, page 37).

- Wait at least two hours after a complete meal to start gardening.

- Prioritize tasks to complete lighter gardening tasks before those that are more strenuous.

- Start early in the day when temperatures are lower.

- Plan to complete only one heavy gardening task per day.

- Alternate a task with a rest period.

- Carry a portable phone to summon help if needed.

- Stop any activity immediately if dizziness, shortness of breath, or joint pain occurs.

- Pace your activity. Between tasks, perform muscle-stretching exercises.

- Take a kitchen timer to the garden area and set it for 10–15 minute intervals as a reminder for rest periods.

- Avoid overhead reaching and below-the-waist bending activities, which expend extra energy.

- Build raised garden beds and arrange containers to allow working from a sitting position, which helps conserve energy.

- Use long-handled tools (weeders, spades, bulb planters, grass shears, etc.) in a standing position to reduce reaching and bending.

- Hoe, rake, and cultivate for short periods of time only. Hold tools close to the body and pull in with short strokes. Avoid reaching out too far.

- Avoid lifting or holding anything for long periods. Use a lightweight container or wear a fisherman's vest or an apron to carry several small objects. Use a wheelbarrow or garden cart to minimize carrying and consolidate trips.

- Avoid spreading soil and digging whenever possible.

- Design storage areas near the house with shelves lower than head height to avoid overhead reaching.

- Avoid staying in one position for too long. Change positions frequently.

- Drink fluids at least once per hour.

- Use assistive devices to make tasks easier by reducing stress to joints.

- Enjoy low-energy horticulture activities such as flower arranging, bird feeding, and indoor plant propagation. Many nature craft projects can be accomplished with little energy and are fun to do.

- As with all physical activities, consult your physician to determine what is the safest level for you.

Garden Strategies for the Visually Impaired

Introduction by Carol Schultz, WSU Master Gardener

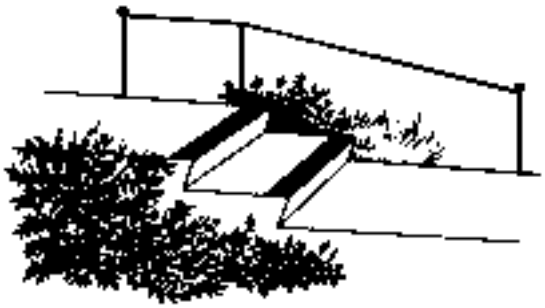
I dedicate this project to my special friend, Marilyn Robinson. I thank her for opening many windows of opportunity for members in our community. Her love of people, teaching, creating, community service, and philanthropy for the blind make her a truly inspirational humanitarian. Marilyn's kindness, generosity, and devotion have been my inspiration. In Marilyn's honor, I hope this publication will enrich the lives of many gardeners.

For gardeners with visual limitations, working safely in the garden is the first priority. An orderly garden is easier for the visually impaired gardener to plant and maintain. Before planting, have an experienced, sighted gardener check the garden for any poisonous or dangerous plants or weeds. Watering, weeding, pruning, and pest control are needed in all gardens and can be challenging. If the gardener has limited sight, it is difficult to detect diseases and pests in the early stages. Assistance from a sighted friend is helpful.

Planning and Design

- A change in contrasting path materials, sound features such as fountains or wind chimes, or a tree or shrub can be used to define the entrance to specific garden locations.

- Paths and paved areas should be smooth, level, firm, and as straight as possible. Path edging should be distinct.



- If steps are involved, a rail should begin several feet prior to reaching the stairs. Painted color contrasts on the steps can be helpful.

- Raised beds, containers, and vertical elements such as low walls and fences make plants easier to tend, harvest, and enjoy.

- Flower borders and planted beds should not be more than three feet across. Island beds can be wider if the gardener can easily reach the center when working with short-handled tools.

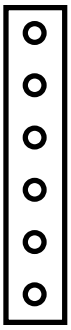
Planting

- Arrange plants in beds in groups of three to five to make plant location easy.

- In the vegetable garden, plant crops in straight rows. Tie a rope or cord with evenly spaced knots and stretch the rope between two stakes. The knots will indicate the placement of transplants. Any plant that does not grow along this line can be considered a weed and pulled.

- Seeds can be planted along each knot, pushed in with a finger to the proper soil and covered. Pick up tiny seeds with a damp finger and spread a few seeds onto 3/4 inch pieces of precut tissue. Wad up and plant the tissue-enclosed seeds.

- A wooden board with evenly spaced notches can also be used as a planting template. Seed planting can be made even easier by using pelletized seed or purchased seed tape.



- Plants can be identified using labelers with large print or Braille. Ornamental stakes or pegs are also available.

- For centering container plantings, place a smaller pot in the center of the soil-filled container. Plant around the sides of the larger pot, leaving the smaller pot in place. Then press down the soil with the smaller pot, remove it, and place a final plant into the remaining hole.

Plant Materials

Using plants that appeal to the senses is especially important for gardeners with restricted vision. For plant recommendations, see Sensory Gardens and Plant Selection, page 18.

Tools

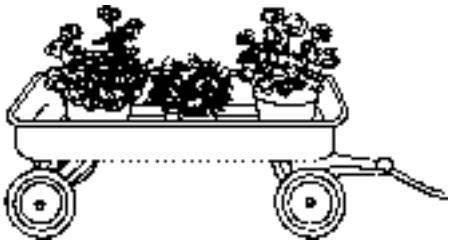
- Select tools that are durable, lightweight, and easy-to-use. Choose trowels with engraved markings that will indicate soil depth.

- Purchase or paint tool handles with bright colors for easier identification and to contrast with the soil.

- Tools with short handles are good for cultivating and permit the gardener to feel the soil.

- Wearing a garden apron, garden vest, or tool belt will keep the hands free and avoid accidental misplacement of tools.

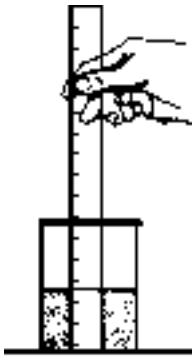
Maintenance



- Use a four-wheeled wagon or garden cart to carry larger tools and plants. It can be pulled with one hand.

- When filling a watering can, insert the fingers inside the top of the can to feel the appropriate water level.

- Drip irrigation systems and soaker hoses in the garden are very efficient and keep pathways from becoming wet and slippery. Soil moisture should extend about six inches into the root zone and can be measured by inserting a trowel into the ground and feeling the soil with the fingers. Determine how long it takes a particular sprinkler to apply the necessary moisture. An automatic timer can be set to turn on and shut off the water supply.



- Use a homemade rain gauge to measure rainfall and irrigation. Place several cans or jars with straight sides around the garden. After irrigating for a specified period, measure the water collected in the cans with a Braille ruler. On average, one inch of water per week is sufficient for lawns. Time sprinklers according to the amount of water they deliver.

- Before weeding, learn to identify weeds by shape, touch, or smell. When weeds do appear, it is best to hand pull them or use short-handled tools to remove them. A two to four inch layer of mulch around garden plants will help prevent weeds and will also retain moisture in the soil.

- To prune small shrubs, follow the branch to be removed with your hand until you find where it meets the main limb or trunk. Use one-handed pruning shears or a limb saw to remove the branch.

- To prune plants with thorns, wear gloves that have a hole for the lower tip of the index finger. This allows the gardener to carefully run the index finger along the stem or branch to locate thorns and avoid scratches.

- Hire a professional arborist to prune large or difficult-to-reach branches.

Pest Control

- Many pest problems can be avoided by making sure the plant has ideal growing conditions. Putting the right plant in the right place helps ensure a healthy, problem-resistant plant.

- Non-chemical control measures include encouraging beneficial insects, using insecticidal soaps and horticulture oils, and spraying pests with a firm stream of water.

- Garden centers carry pre-mixed and ready-to-use products. Be sure to follow all label instructions.

- The WSU Master Gardener Plant Clinic can identify pests, insects, plants, weeds, and diseases, and provide management options.

Gardening Strategies for Older Adults

As we grow older, our physical, emotional, and cognitive abilities change. Gardening is a wonderful way to help the older adult improve and maintain these abilities and to increase social interaction as well. This information offers tips for adaptations to the garden area and modifications for gardening practices that will help the older gardener continue gardening.

Adaptations for Physical Changes

- Buy larger or pelletized seeds that allow the gardener to more easily see and manipulate the seeds when planting.

- Plant bright red, orange, or pink flowering plants. Vision limitations create difficulty distinguishing green, blue, and violet.

- Provide plant foliage with varying textures and plants with fragrance, which allows the gardener to maximize tactile and olfactory senses.

- Design garden areas with non-reflective materials. Changes in depth perception can affect safety while walking.

- Place stools around the garden that will provide an intermediate step between standard gardens and raised beds. Stools can help reduce the possibility of falls.

- Provide shade, whenever possible, including table umbrellas or umbrellas in stands placed throughout the garden.

- Adapt tools to give better leverage and improved grip to help those with decreased agility and strength (see Adaptive Tools, page 49).

- Build raised bed gardens. They reduce the need to bend or kneel and allow wheelchair-bound gardeners easy access (see Raised Bed Gardening, page 6).

- Widen the edges of raised beds to allow sitting room. Gardeners with balance difficulties will feel safer.

- Regulating body temperature effectively can be difficult because of changes in the skin and underlying tissue. Apply sunscreen and provide hats to protect face and neck.

- Ensure adequate fluid intake to combat signs of dehydration in warm weather. Fluid imbalance is a concern for gardeners with health problems such as heart or kidney disease or those who are taking multiple medications.

- Provide protective clothing, gloves and sturdy shoes. This will help prevent scratches and decrease the incidence of infection, which occurs more frequently in the older adult and those with diabetes.

Adaptations for Cognitive Changes

- Plant old-fashioned flowers, herbs, and vegetables that the gardener is familiar with to trigger memories and increase cognitive stimulation.

- Position a familiar focal point in the garden area to allow for easier orientation.

- Provide garden art appropriate to the current holiday to increase awareness of seasons.

- Code the garden area with signs and labels to remind memory-impaired gardeners where they are.

Adaptations for Socialization

- Place the garden area in a somewhat enclosed area to provide a sense of security. Many older adults have an increased fear of accidents and outside events. A safe environment encourages them to participate in activities.

- Allow the gardener to participate in the choice of plant materials or provide input into garden planning. Such activities help maintain a feeling of independence and control.

- A trip to a nursery or plant sale will brighten the day of a housebound gardener.

- Encourage intergenerational gardening, which provides an opportunity to share garden wisdom. Through these teaching experiences, the older adult will feel less isolation and higher self-esteem.

Gardening Strategies for People with Joint and Muscle Limitations

Introduction by Becky Cresswell, WSU Master Gardener

My dad, Bill, taught me how to plant my first childhood zinnia garden. Today, many gardens later and with a bit more arthritis in his knees, he continues to be my inspiration while we're "Still this side of the dirt!" he laughs and says. I know together we will be planting a lot more gardens to come—either way.

Difficulty with grasping, lifting and range of motion can be caused by conditions such as arthritis, carpal tunnel, and neurological problems. The adaptive techniques described here can help gardening remain a source of pleasure for gardeners with joint and muscle limitations.

- Garden in containers with wheeled caddies. They can be moved easily and allow the gardener easier access for maintenance.

- Grow hanging plants in baskets placed on pulleys for easier watering and grooming.

- Avoid heavy clay pots. Plastic buckets have the added advantage of handles for lifting. Remember to cut holes in the bottom of unconventional containers to allow for drainage.

- Replace soil in the bottom half of large containers with foam or plastic packing pieces to lighten the container. Pack the material loosely in plastic bags before placing in the container. It is easier to remove when necessary.

- Raised garden beds will decrease stress to the back and prevent the overuse of joints. The width should not exceed half the reach of the gardener. Construct the height of the bed so that it matches the gardener's bending ability. Add bars to help the gardener move around the beds safely.

- Kneeling benches add extra safety for gardeners with limited range of motion.

- Seed tape strips are a good alternative to manual seeding. They allow the gardener to plant rows of seeds easily and accurately.

- Use PVC pipe with a "V" cut in the end to feed seed through when planting at ground level. Bending and kneeling is avoided.

- Consider installing some type of drip irrigation system rather than pulling heavy hoses.

- Wrap tool handles with foam to enlarge and cushion grips, which improves comfort for arthritis sufferers.

- Place D-Grip or Bar Grip devices on long-handled tools to increase leverage.

Resource Guide

Resource Guide

Books

Adil, Janeen R. *Accessible Gardening For People With Physical Disabilities: A Guide to Methods, Tools and Plants*. Bethesda, MD: Woodbine House, 1994.

Rothert, Gene. *The Enabling Garden: Creating Barrier-Free Gardens*. Dallas: Taylor Publishing Co. 1994.

Yeomans, Kathleen. *The Able Gardener: Overcoming Barriers of Age and Physical Limitations*. Pownal, VT: Storey Communications, 1992.

Associations

American Horticultural Therapy Association
909 York Street
Denver, CO 80206-3799
303-331-3862
www.ahta.org

People-Plant Council
Department of Horticulture
Virginia Polytechnic Institute
Blacksburg, VA 24061
www.hort.vt.edu/human/PPC.html

Local Organizations

Aging and Long Term Care of Eastern Washington
509-458-2509

Arthritis Foundation
509-747-7803

Coalition of Responsible Disabled
509-326-6355

Elder Services Information and Assistance
509-458-7450

Lilac Blind Foundation
509-328-9166

Multiple Sclerosis—INW Chapter
509-482-2022

Rotary Club of Spokane
509-534-8998

Senior Program Community Colleges of Spokane
509-533-3393

WSU Master Gardener Plant Clinic and Resource Center
County Extension Education Center
222 N Havana Street
Spokane, WA 99202
509-477-2048

Appendices

Measurements for Barrier-free Design

Wheelchair Dimension Guide

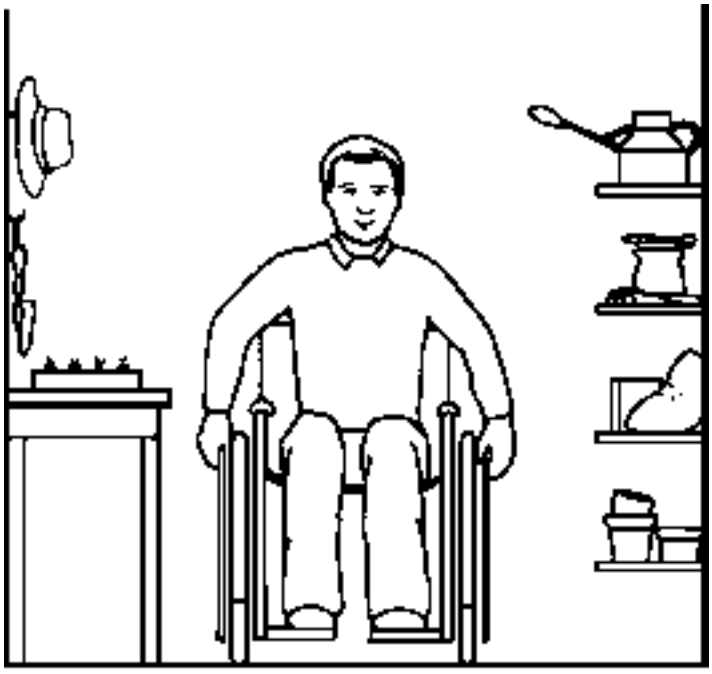
Length—42"

Open width—25"

Collapsed width—11"

Seat to floor—19½"

Armrest to floor—29"



Wheelchair Access

Minimum turning space for 360º—60"

Minimum turning space for 180º—36"

Side reach limit, high—54"

Side reach limit, low—9"

Safest ramp slope—1:12

Workspace height—30–33"

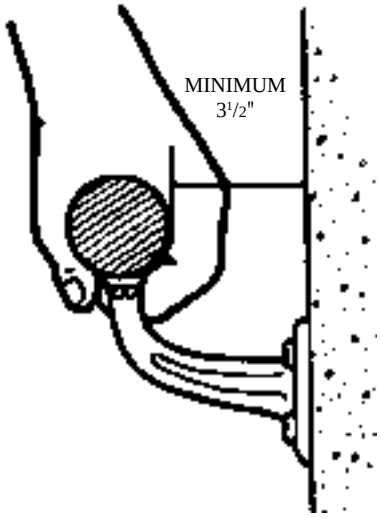
Minimum clear door opening—36"

Raised Bed Size Guide

Gardener	Maximum Height	Maximum Width
Men		
Ambulant	39–40"	36"
Seated, but able to get up from chair	30"	25"
Chairbound	24"	16"
Women		
Ambulant	35–37"	36"
Seated, but able to get up from chair	27"	21"
Chairbound	24"	16"

Handrail Measurement Guide

Round wooden handrails are more comfortable for outdoors than metal tubing, which can heat up in the sun. Place at least 3 1/2 inches away from walls to avoid scraped knuckles. Paint with high gloss exterior paint or varnish.



Hard-Surface Paving Options

	Suitability for Wheelchairs	Suitability for Canes, Walkers	Use on Ramps	Ease of Installation	Aesthetic Appearance	Cost Range	Maintenance Requirements
Concrete	good	good	yes	easy	poor	cheap-medium	some
Asphalt	good	good	yes	fair	poor	cheap-medium	yes
Pre-cast Concrete Slabs	good	varies	yes	fair	poor	cheap-medium	some
Pattern Pave	fair	poor	yes	hard	fair	medium-expensive	none
Interlocking Blocks	good	good	yes	hard	good	medium	none
Stone Slabs	good	varies	yes	hard	good	medium-expensive	none
Brick	good	varies	yes	fair	good	medium-expensive	none
Gravel	poor	poor	no	easy	good	cheap	yes
Wood	poor	poor	yes	easy	good	medium	yes
Cobbles in Concrete	poor	poor	no	fair	good	medium-expensive	none
Bark	poor	poor	no	easy	good	cheap	yes

Courtesy of the University Press, University of Saskatchewan

Soft-Surface Paving Options

Material	Advantages	Disadvantages	Comments
Turfgrass	Cheap, attractive, cooling effect, acceptable if ambulatory	High maintenance, too soft for wheelchairs and walkers	Not recommended
Wood chips	Cheap, attractive, readily available, acceptable if ambulatory	Decays in wet climates, requires replacement, soft surface	Apply a minimum of 4 inches deep
Compacted soil	Firm surface when dry, cheap if native soil used, low maintenance if compacted	Tracks when wet, soft when wet, erosion	Must drain well, better in dry climates, must be firmly compacted
Crushed limestone	Readily available, firm surface when compacted, low maintenance	Mix too fine, tracks when wet	Not recommended
Decomposed granite	Firm, level surface when compacted, low maintenance, good traction, drains well	Loose material on surface can be slippery, somewhat expensive	Highly recommended
Screenings or #9 crushed stone	Firm level surface, inexpensive, drains well	Loose material on surface can be slippery	Recommended

Courtesy of The Enabling Garden, by Gene Rothert

Poisonous Plant List

Anyone planning or planting a garden that might be used by a person who could accidentally ingest a plant part, such as an older person with cognitive problems or a young child, should be aware of plants that can be toxic. Below is a partial list of plants that can cause irritation, illness or death. Not included, but also of concern, are plants that have thorns or spines that can cause injury to the unwary.

Plant	**Poisonous Parts**
Azalea	Entire plant
Bittersweet	Bark, leaves, seeds
Black Locust	Bark, leaves, seeds
Boxwood	Bark, leaves
Buckeye/Horse Chestnut	Sprouts, nuts, seeds
Buttercup	Leaves
Caladium	Entire plant
Castor bean	Entire plant
Crocus	Entire plant
Daffodil	Bulbs
Daphne	Bark, leaves, flowers
Dumb cane	Entire plant
Foxglove	Entire plant
Fruits: almond, apples, apricot, cherry, peach, pear, plum	Seeds, pits
Hemlock	Entire plant
Holly	Leaves, berries
Hyacinth	Entire plant
Hydrangea	Entire plant
Ivy, English and Baltic	Leaves

Plant	Poisonous Parts
Jerusalem cherry	Entire plant
Jimson weed/Thorn apple	Entire plant
Larkspur/Delphinium	Leaves, seeds, plant
Lily of the Valley	Leaves, flowers
Marigold	Resinous substance
Marijuana	Entire plant
Monkshood	Entire plant
Morning glory	Seeds, roots
Nightshade	Entire plant
Philodendron	Entire plant
Poinsettia	Entire plant
Poison ivy, oak and sumac	Entire plant
Potato	Raw tubers
Rhododendron	Entire plant
Rhubarb	Leaves
Walnut	Green shells
Wisteria	Entire plant
Yew	Entire plant

What to do in an emergency

If you suspect someone has eaten part of a poisonous plant, take him or her directly to an emergency center. Always collect a large sample of the plant and take it with you for identification.

Don't try to induce vomiting. If transportation to an emergency center is not immediately available, give the person water or milk and call the local poison center (in Spokane and northern Idaho call 1-800-732-6985).

Seeding Schedule for Annuals

Annual	When to start planting out	Temperature for germination	Days to emerge	When to transplant seedlings	Ideal temperature for germination	Hardiness	Comments
Aster	6 wks	70–75°	10–20	3 wks	60˚	HH	Need 12 hr. light period. Do not harden off severely. Soil pH, 1–5.
Begonia Fibrous	Jan.	70°	2–3		60˚–65˚	HH	Cover seed lightly with sand to protect emerged seedlings. Grow at 14–15 hours of light per day.
Celosia	4–6 wks	70–75°	10–15		70˚	T	Use lukewarm water at all times. Transplant same depth as original seedling.
Coleus	8–10 wks	70–75°	10–15	15 days	70˚	T	Do not cover seed. Coleus transplants can damp off easily. Keep soil warm.
Dahlia	4–6 wks	70–80°	7–14	3 wks		T	Set out in June.
Dianthus	6–8 wks	70°	7–14	4–5 wks	50˚	HH	Water with lukewarm water. Transplant same depth as original seedlings.
Dusty Miller	10–12 wks	70–75°	20–25			HH	Do not cover seed. Grows slowly.

VH Very hardy. Will actually stand frost.
H Hardy. Will stand light frosts with little damage.
SH Semi-hardy.
HH Half hardy. Stands cold weather, but not frost.
T Tender. Will do poorly in cool or cold weather. Susceptible to frost.

Annual	When to start planting out	Temperature for germination	Days to emerge	When to transplant seedlings	Ideal temperature for germination	Hardiness	Comments
Geraniums (Seedlings)	12–14 wks	70–75°	10–14	4–5 wks		T	Grow new transplants at 72˚ for two weeks. Then lower to 62˚.
Impatiens	6–8 wks	70°	10–14		65˚	T	Do not cover seed. Do not over-water nor over-fertilize. Keep plants on small side.
Lobelia	10–12 wks	70°	15–20	4 wks	45˚–55˚	HH	Sow seed as thinly as possible. Transplant in clumps of 4–5 seedlings.
Marigold	6–7 wks	70–75°	5–7	4 wks	55˚–60˚	HH	Do not plant outside until soils reach temperatures of 45˚ F.
Portulaca	6 wks	70–85°	14		60˚	T	Direct seed into packs. Cover seed lightly.
Salvia	4–6 wks	70–75°	5–14	15–20 days	55˚–60˚	HH	Do not cover seed. Water with warm water.
Snapdragon	6–8 wks	70°	10–14	6 wks	50˚	VH	Do not cover seed. Water with warm water.
Alyssum	4–6 wks	75°	7–14		55˚	VH	Use well drained soil. Neutral pH. Do not cover seed.
Zinnia	4–6 wks	70–75°	5–7	10 days	70˚	T	Cover seed lightly. Use warm water. Transplant as soon as possible at same depth.

Seeding Schedule for Vegetables

Vegetable	When to start planting out	When to set out (# weeks before or after last frost date)	Optimum temperature for germination	Days to emerge	Ideal temperature for transplants	Suggested container size	Comments
Broccoli Brussel sprouts	5–8 wks	4 wks before	70–75˚	10–15	60º	2" sq. pots	Keep cool to get sturdy plants, but do not let temperature go below 40˚
Cabbage	5–8 wks	5 wks before	70–75˚	4–10	60º	2" sq. pots	Keep cool to get sturdy plants, but do not let temperature go below 40˚
Cauliflower	5–8 wks	1–2 wks before	70–75˚	5–10	60º	2" sq. pots	Very touchy about temperature; keep at 57˚ to 68˚F.
Chinese cabbage	4 wks	4–6 wks before	70–75˚	3–5	60º	2" sq. pots	Keep cool to get sturdy plants, but do not let temperature go below 40˚
Cucumbers	2–3 wks	1–2 wks after	75˚	3–8	70º	2" sq. pots	Sensitive to transplanting. Trim off extra plants—do not pull
Eggplant	6–8 wks	2–3 wks after	70º	5–13	75º	2½" sq. pots	Sensitive to cold. Harden off carefully.

Vegetable	When to start planting out	When to set out (# weeks before or after last frost date)	Optimum temperature for germination	Days to emerge	Ideal temperature for transplants	Suggested container size	Comments
Kohlrabi	5–8 wks	5 wks before	70–75˚	3–10	60º	2" sq. pots	Keep cool to get sturdy plants, but do not let temperature go below 40˚.
Leeks Onions	8–10 wks	6 wks before	70˚	7–14	60º	Seeds 1/4" apart, row 1" apart	Keep cool for sturdy plants. When plants are 4" tall, cut with scissors to 2".
Lettuce	5–7 wks	2 wks before	65–70˚	3–6	60º	1½" sq. pots	Keep cool for sturdy plants. Lettuce is sensitive to transplanting.
Muskmelon Watermelon	2–3 wks	2–3 wks after	75˚	3–8	75º	2" sq. pots	Sensitive to transplanting. Trim off extra plants—do not pull.
Parsley	4–6 wks	4–6 wks after	70–75˚	12–17	60º	1" apart in flat	Soak seeds overnight to speed germination.
Peppers	6–8 wks	2–3 wks after	75–80˚	8–13	70º	2½" sq. pots	Sensitive to cold. Harden off carefully.
Pumpkins Squash	2–3 wks	1–3 wks after	70–75˚	6–10	70º	2" sq. peat pots	Sensitive to cold. Harden off carefully. Cut off extra plants.
Tomatoes	6–10 wks	2–3 wks after	70–75˚	6–14	70º	3" sq. pots	Likes warm days, 70–75˚F. Cooler nights, 60–65˚F.

Cooperating Agencies: Washington State University, U.S. Department of Agriculture, and Spokane County.

WSU Extension bulletins contain material written and produced for public distribution. You may reprint written material, provided you do not use it to endorse a commercial product. Alternate formats of our educational materials are available upon request for persons with disabilities. Please contact the Information Department, College of Agricultural, Human, and Natural Resource Sciences, Washington State University for more information.

You may order copies of this and other publications from the WSU Bulletin office, 1-800-723-1763, or online http://pubs.wsu.edu

Issued by Washington State University Extension and the U.S. Department of Agriculture in furtherance of the Acts of May 8 and June 30, 1914. Extension programs and policies are consistent with federal and state laws and regulations on nondiscrimination regarding race, sex, religion, age, color, creed, national or ethnic origin; physical, mental or sensory disability; marital status, sexual orientation, and status as a Vietnam-era or disabled veteran. Evidence of noncompliance may be reported through your local Extension office. Trade names have been used to simplify information; no endorsement is intended.
Revised January 2005. Subject codes 200, 256, 635. S. MISC0545