



## Natural Resources Conservation Service

### CONSERVATION PRACTICE STANDARD

#### RAISED BEDS

##### CODE 812

(sf)

#### DEFINITION

Create an above ground growing environment.

#### PURPOSE

This practice is used to accomplish one or more of the following purposes:

- Reduce concentration of salts or other chemicals in the soil that limit the desired use
- Reduce field operation-induced particulate emissions within the raised bed footprint
- Increase plant health and productivity

#### CONDITIONS WHERE PRACTICE APPLIES

This practice applies to land in habited areas where the desired reuse is for crop and small livestock production and where the existing growing media is unsuitable for production.

The practice is applicable where soil conditions are degraded due to unsuitable growing substrate or due to the potential of heavy metals and other contaminants that pose an environmental and/or safety risk to the producer and/or the intended crop. The bed(s) will be used for managing the production of agricultural crops where in situ growing media is a limiting factor.

An above ground raised bed is needed for crop production on sites where it is impractical to regenerate soil condition or remove debris and obstructions from the site.

This practice does not apply to roof top agriculture, container gardening or indoor vertical farming. This practice does not apply to aquaculture production of fish or seafood.

#### CRITERIA

##### General Criteria Applicable to All Purposes

Create beds that are between 6 and 24 inches above the in-situ soil to support healthy root system development. Determine the required bed area and depth by analyzing the needs of planned crops.

The need for a barrier, regardless of raised bed depth, will be determined by evaluating the potential for plant roots to contact contaminants or debris and the upward movement of contaminants.

When detection of heavy metal contamination is within or exceeding the Vermont safety thresholds for residential use as defined by land grant university (LGU) research and recommendations, use a 4oz. heavy duty non-woven landscape fabric to be placed between the in-situ soil and the new growing substrate to reduce the exposure of plant roots to contaminants. Levels of contaminants will be determined by using a portable x-ray fluorescence (pXRF) or by implementing a Site Assessment and Soil Testing for Contaminants (CEMA 207) activity.

Beds may be framed or unframed. Framed beds will be used if equipment needed to make un-framed beds is not accessible, or the site is not accessible to the equipment, as is common in urban farms located within city limits.

Raised beds can be made into any shape desired.

Design the width of the raised bed to limit the need for stepping into or on the raised bed. The length of a raised bed varies by the available space.

Ground disturbing operations will be conducted in a manner that will not compromise the structural integrity of the barrier.

Framed beds should be constructed using untreated, rot resistant lumber such as cedar, white oak, locust, etc. Tires, chemically treated lumber, landscape timbers, railroad ties, and methyl bromide treated pallets are not suitable framing material.

Growing media free of debris and contaminants such as compost or a compost/clean soil mixture may be used. Characteristics of the chosen growing media will support the needs of the plants to be grown.

Designated walkways or travel lanes to control foot traffic and movement between beds should provide adequate width to accommodate foot traffic and equipment.

## **CONSIDERATIONS**

Drainage of beds with non-woven barriers needs to be considered and discussed to prevent over saturation of the growing substrate.

Cover walkways and other areas of exposed soil to reduce dust migration and splash back onto crops and protect against human exposure while gardening. Refer to CPS 575 Trails and Walkways to establish pathways.

Consider CPS Mulching 484 to reduce dust emissions from small between-bed spaces.

Raised beds and travel walkways should consider accommodation for access by persons with limited or impaired mobility.

When growing crops that sprawl, such as squash or watermelon, plant in a bed by themselves.

For best light exposure, plan to build beds in a north/south orientation (plant taller plants on the north side of shorter plants to avoid shading smaller plants).

The producer may practice multispecies cropping, conservation crop rotation, cover cropping, and/or single species cropping. If disease carry over is a concern and crop rotation is not possible, crop residues should be removed and composted to the appropriate temperatures to avoid potential contamination of the next crop. If residues are removed, cover crops should be considered to prevent erosion and/or increase organic matter.

Where in-situ soil is formed from construction debris material it is possible to find elevated concentrations of salts derived from the decomposition of concrete or other materials, these conditions could produce elevated pH levels. Consider adjusting pH levels to prevent the mobility of known heavy metals.

## **PLANS AND SPECIFICATIONS**

Plans and specifications will be prepared for the practice site. Plans and specifications for the installation and placement of raised beds may be recorded in narrative form, on job sheets, or on other forms. Plans will include the following:

- Location of raised beds on the tract

- Height, width, and length of each bed
- Requirements for imported growing material: If available, refer to information on soil material for raised beds
- Framing material (if used)
- Space in between beds needed to accommodate all users
- Barrier specifications, if applicable

## OPERATION AND MAINTENANCE

An operation and maintenance plan will be provided to and reviewed with the operator/landowner. The plan will include the following items and others as appropriate.

- Monitor and maintain height of raised beds and material within the raised beds.
- If framed beds are used, periodically check all frame joints and boards, and repair/replace any failures as soon as possible.
- When compost or high organic matter material is utilized as growing media, material should be replenished to maintain the minimum of 6 inches above the surrounding soil to optimize drainage and up to 24 inches above the surrounding soil when roots must be separated from the in-situ soil.
- Inspect and maintain associated surface and subsurface drainage practices to manage erosion and concentrated flows.
- Monitor site erosion and implement needed conservation practices as applicable as soon as possible.
- Soil testing will occur every 3 years or as determined by university recommendations at a minimum test for known contaminants found within the region and soil organic matter.
- Maintain all travel and working surfaces in a smooth and graded condition, free of ruts and depressions that can collect and hold water.

## REFERENCES

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Murphy, Stephanie. 2020. Soil for Raised Beds (FS1328). Rutgers Cooperative Extension.

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