STANDARD

LAND SMOOTHING (Acre)

Definition

Removing irregularities on the land surface by use of special equipment.

Scope

This practice applies to operations classed as rough grading. Ordinarily, this does not require a complete grid survey. It does not apply to the "floating" done as a regular maintenance practice on irrigated land or the "planning" done as the final step in precision land forming (462) or in irrigation land leveling (464).

Purpose

Improve surface drainage, provide for more effective use of precipitation, obtain more uniform planting depths, provide for more uniform cultivation, improve equipment operation and efficiency, improve terrace alignment, and facilitate contour cultivation.

In cranberry bogs, land smoothing is used to construct a more level bog to reduce the amount of water needed for flooding.

Conditions Where Practice Applies

This practice applies on areas where depressions, mounds, old terraces, turn rows, and other surface irregularities interfere with the application of needed soil and water conservation and management practices.

It is limited to areas having adequate soil depth or where topsoil can be salvaged and replaced.

In cranberry bogs, this practice applies where: (1) leveling of the bog is included in an overall irrigation water management plan; and (2) based on the grower's planned management of the bog, smoothing will reduce the amount of water required to adequately flood the bog for harvesting, trash removal, pest control, or other purposes.

Planning Consideration for Water Resources

WATER QUANTITY

This practice improves surface drainage to provide more effective use of precipitation; improve farming operations; and increase in crop production. It may increase or decrease runoff rates, runoff volumes, and the time of concentration of runoff depending on the flow path configuration. However, smoothing reduces surface storage infiltration, and deep percolation from the surface ponding. In cranberry bogs, this practice will reduce the amount

of water required to adequately flood the bog for harvesting, trash removal, pest control or other purposes.

WATER QUALITY

An increase in volume and runoff velocity may increase the amount of sediment, other solids and chemicals in runoff. This practice facilitates the installation of other practices which may have a tendency to reduce the amount of sediment, other solids and chemicals from entering runoff. By reducing ponding, infiltration, and deep percolation this practice will reduce the risk of transporting dissolved chemicals into ground water.

Design Criteria

The extent of rough grading required and tolerances of the finished smoothing job shall be in keeping with the requirements of the planned cropping system.

The smoothed surface shall slope either uniformly or at varying grades into natural or constructed outlets. Surface drainage field ditches must be provided as needed on all smoothed fields to collect and dispose of surface runoff. The design, number, location and spacing of field ditches shall be in accordance with the State Drainage Guide. The depth of smoothing shall be controlled to prevent exposing harmful amounts of subsoil.

In cranberry bogs, the extent of land smoothing required and tolerances of the finished job shall be in keeping with the irrigation water management plan. The smoothed bog shall be as flat as practical to minimize the amount of water needed for flooding, while maintaining adequate surface drainage to the bog ditches, as needed.

Plans and Specifications

Plans and specifications for land smoothing shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

Operation and Maintenance

An operation and maintenance plan shall be developed and provided to the landowner. This plan should consider the following general recommendations as applicable:

1. Good management methods for planting, cultivating and harvesting are necessary to keep a smoothed area flat and uniform to maintain adequate surface drainage.

2. Any settled areas will need filling to maintain adequate surface drainage.

3. During sanding operations in cranberry bogs, sand should be applied as uniformly as possible to maintain a level and uniform bog.

Supporting Data for Documentation

DESIGN DATA. The following information shall be recorded in the design and/or on the drawings, as applicable:

1. Sketch showing the area or bog to be smoothed.

2. The land area in acres to be smoothed.

3. Survey shots taken to determine the degree of smoothing required.

4. In cranberry bogs, the volume of water required before and after smoothing to attain the desired depth of water for flooding.

5. Special considerations for surface drainage, if needed.

CHECK DATA. The following information shall be recorded on the drawings or on the design to certify installation of this practice:

1. Check notes to show that the area is smoothed and leveled to the planned elevations.

2. Installation of surface drainage, as needed.

Specifications

1. Construction operations shall be carried out in such a manner that erosion and air and water pollution are minimized and held within legal limits.

2. The land to be smoothed shall be cleared of vegetative matter and trash.

3. Irregularities that are not likely to be removed by three passes of a land plane or a land leveler shall be rough graded to a more uniform topography before starting the overall smoothing operation.

4. Where possible, the ground surface should be plowed or disked prior to smoothing.

   Smoothing operations shall not be performed when the ground is frozen or if soil moisture conditions are such that they could cause excessive damage to the soil structure, resulting in poor crop growth or detrimental settlement.

5. In making cuts, the removal of all topsoil shall be avoided, if possible. Thin layers shall be taken from a larger area.

   Sufficient topsoil shall be left to permit satisfactory crop production with the application of proper conservation measures.

   Where cuts remove all topsoil, the topsoil removed shall be stockpiled; and replaced on the disturbed areas after the cuts are completed.

6. Smoothing shall be accomplished by removing soil from high areas and using it to fill low areas to create a flat or uniformly sloping surface.

   At least three passes of a land plane or leveler shall be made in different directions over the land to be smoothed, consisting of one pass along each diagonal and the last pass generally in the direction of cultivation or irrigation. Free drainage shall be provided from all depressional areas.

   On cranberry bogs, a dozer or other equipment can be used that will adequately level the bog without excessive compaction of the soils.

7. Fills shall be compacted through settlement or by systematic crossing with construction machinery. When compaction is accomplished by fill settlement, an overfill of 10 percent of the total fill shall be provided for fills exceeding 6 inches.