

## Crop Suitability

Although not all crops can be grown under minimum tillage, several have been successfully grown. These can be placed into groups as follows:

**Tree Crops** All tree crops -fruit, lumber, fuel wood

**Legumes** Pigeon peas, cow peas, red peas/ beans, forage legumes, peanuts

**Cereals** Corn, sorghum

**Vegetables** Tomato, pepper, garden egg, pumpkin, watermelon, cucumber

**Root Crops** Cassava, sweet potato

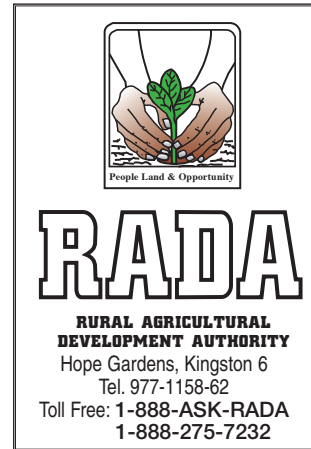
**Others** Sorrel

## Role of Mulching in Minimum Tillage

For a sustainable minimum tillage system, a supply of vegetative materials to serve as a mulch must be maintained on the soil surface. Mulch can be obtained from crop residues, corn, legumes weeds, grass and cover crop. Macuna is a promising crop cover, a legume which contributes to natural soil fertility. As a vegetative mulch, it also improves the organic matter content. It plays a major role in soil temperature management, weed control and in soil and water conservation. The vegetative mulch can hold several times its weight in water and allows time for water entry into the soil. Water is also retained in the mulch itself on the soil surface. The mulch also prevents the contact of the raindrops with the soil and even if soil particles are detached they are detained among the mulch.



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## Best Bet Technology



## MINIMUM TILLAGE



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# Minimum Tillage

**T**illage includes all the practices which are involved in breaking up the soil to create a better environment for crop production. Several reasons have been given for the need to till the soil. These include:

- Creation of a suitable seedbed
- Maintenance of soil in an aerated and porous state
- Breaking of crust and other hard soil layers
- Controlling weeds
- Creation of contour furrows, beds and drains for optimum crop and soil management
- Burying crop residues and weeds
- Controlling pests and pathogens
- Incorporation of fertilizer, manure, lime, etc.

Traditional tillage involves forking or ploughing every season a crop is to be produced, compared to minimum tillage in which the soil is less disturbed.

Minimum tillage is not new to farmers in Jamaica. Farmers in St. Elizabeth have been using minimum tillage and mulch. Various forms are in use for corn, peas, tree crops and pumpkin. Many farmers plough the land for planting of crops in the first season, and following the harvesting they plant the second crop without further tillage. However, it is advisable to plough occasionally to ensure organic matter is incorporated into the soil.

The minimum tillage system varies depending on the soil type, crop, degree of slope and the history of soil management at the site, as well as farmers' preferences.

## Factors Encouraging Minimum Tillage

- Increasing concern about the environment especially land clearance and soil erosion.
- Greater use of marginal lands which are unsuitable for cultivation
- Unavailability of farm labour
- Relatively high cost of labour
- Availability of machinery capable of planting crops in uncleared and unploughed lands
- Increased use of sloping lands especially for tree crop production

## Soil and Climatic Conditions Suitable to Minimum Tillage

- Steep slopes
- Shallow gravelly soils
- Soils prone to drought
- Soils with unfavourable subsoil e.g. marl
- Soils with low organic matter content
- Soils with low water and nutrient holding capacities
- Regions characterized by high rainfall
- Areas where rainfall is unpredictable



## Advantages of Minimum Tillage

- Allows for better timing of crop establishment as there is no need to wait for suitable conditions for land preparation
- Soil erosion tends to be reduced as residual vegetative matter is generally present
- Improvement in water retention in the soil due to the presence of residual vegetative matter at the surface
- Allows the use of marginal lands as there is little soil disturbances
- Reduction in land preparation cost



## Disadvantages of Minimum Tillage

- Weed infestation can become a major problem
- Some pests e.g. slugs increase due to greater opportunity for shelter
- Less movement of nutrients into the soil

## Common Minimum Tillage Practices for Cash Crops

- Control weeds with herbicide or by bushing
- Dig holes at recommended spacing
- Place fertilizer in holes and cover with soil
- Plant seeds or seedlings
- Apply mulch where necessary