

Soil Health Companion

Key Soil Health Management Messages









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INTRODUCTION

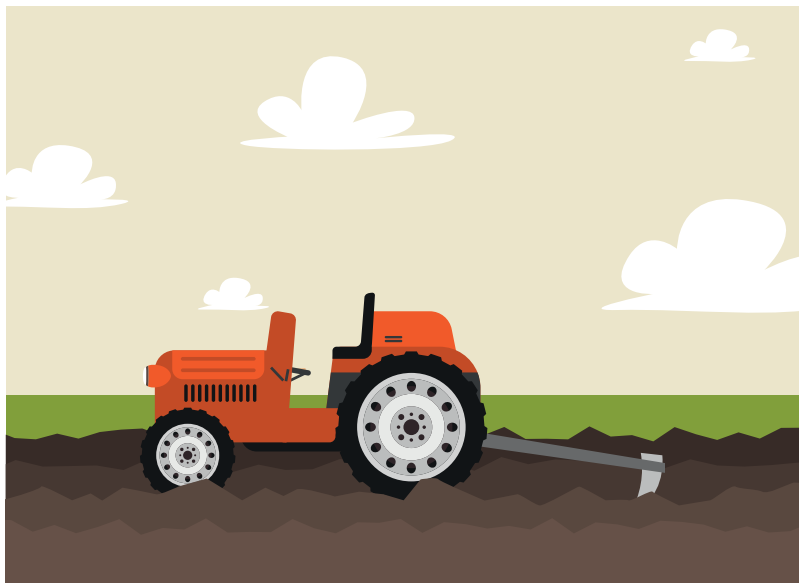
Welcome to the Soil Health Blitz Training Workbook! As a farmer, you know that soil is a critical resource for your crops. Healthy soil can improve crop yields, reduce the need for expensive inputs like fertilizers and pesticides, and contribute to a more sustainable farm operation. That's why understanding soil health is so important.

This workbook is designed to provide you with knowledge on key practices promoting soil health. By the end of this workbook, you will be able to define soil health, learn about principles of soil health, practices promoting soil health and visual indicators of soil health. Activities and worksheets have also been included to help self-assessment of current knowledge and apply what you learn to your own farm. We hope this workbook will equip you with knowledge to help you improve your soil health and ultimately achieve a more sustainable and productive farm operation.



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WHAT IS A HEALTHY SOIL

A healthy soil is a soil with capacity to sustain soil biodiversity while maintaining water and air quality and supporting human health. Healthy soil can support growth of different types of plants and promote existence of a large diversity of living organisms which conducts important soil functions.



WHAT ARE THE PRINCIPLES OF SOIL HEALTH

A healthy soil is soil that satisfies these five principles:

- Has maximum soil cover: it's covered by crop residues or have cover crops growing at any one time
- Experiences minimum disturbances: Land preparation is under minimum or reduced tillage and weeds controlled by the applied soil cover
- Supports existence of maximum biodiversity: always has a diverse species of plants and living organisms
- Presence of plants: Under different species of plants that draws and supplies nutrients in different forms at different soil layers while nourishing diverse organisms in soil
- Integrates livestock: Integrates livestock which draw and supply different forms of nutrients to crops and other organisms in the soil





VISUAL INDICATORS OF SOIL HEALTH

You can be your own soil health doctor. Check for the following symptoms to assess the health of your soil:

- Color of the crop: Dark green is how it should be.
- Crop yield: Sick soil yields low
- Living organisms: Soil is living. More organisms more life.
- Soil color: Dark is how it should be..
- Soil hardness: Soft soil promotes soil life. Roots, organisms, water and air can interact freely.
- Weeds: Weeds indicates nutrient levels. Wondering jew, black jack and amaranth are a symbol of health. However, poverty grass, Mexican marigold or striga shows a sick soil.





PRACTICES PROMOTING SOIL HEALTH






- Conservation agriculture: involves reduced disturbance of soil, maintaining at least 30% of permanent soil cover and crop rotations.
- Integrated soil fertility management: refers to a soil fertility management practices that include proper use of fertilizer, organic inputs and improved varieties, combined with GAPs (i.e., proper spacing, timely plating, weeding, pest and disease control etc.) on how to adapt these practices to local conditions.
- Agroforestry: a practice where trees are integrated in agricultural production i.e., in crop and animal production.
- Pit cultivation: are dug and applied with well composted manure or other organic matter to improve soil fertility and increase moisture conservation.
- Soil and water conservation: This refers to establishment of structures that prevent trans locational loss of nutrients while ensuring maximum percolation of rainwater in the soil.



AGRONOMIC PRACTICES FOR SORGHUM PRODUCTION

Practical application of soil health promoting practices during sorghum cultivation are provided. This involves good agronomic practices that needs to be followed from the time land is cultivated until the produce is set for marketing. These practices include

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- Land preparation: Timing is key. Prepare land to fine tilth before rainfall onset. Minimize disturbance through use of rippers or direct seeders to promote soil health.
 - Planting: proper timing makes a big difference. Optimize on moisture and escape attacks from pests and diseases.
 - Seed selection: Avoid recycling seeds by buying your seeds early. Each seed variety for specific area and season. Select seeds resistant to challenges affecting sorghum production in your area.
 - Proper spacing: Each environment, season and cropping system requires specific spacing. Spacing should reduce competition for growth resources.

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- Thinning: Eliminate weak and pest infected plants through thinning. Don't plant more seeds, move healthy plants to spaces where seeds didn't germinate, if soil moisture allows.
 - Soil fertility management: Go organic. Apply manure and leguminous residue or prunings from agroforestry plants. Earthworms manufacture nutrients, allow them work on organic residues and apply vermi-tea on crops. If organic is insufficient micro-dose inorganic fertilizers from the right source, at the right rate, time, and place (4R-stewardship).
 - Pest and diseases management: Weeds are pests, don't give them a chance. Remove them on time to avoid competition with crops. They house pests. Cultural and biological methods of controlling pest and diseases are recommended to make the environment a safe place for other living organisms.
 - Harvesting: harvest when grain is mature. Aflatoxin kills so keep you grains dry. Clean grains are quality grains, these are the kind everyone will rush to buy.
 - Marketing: store grain until prices are fair. Unity is strength so sell your produce as a group otherwise, join a cooperative. Clean grain means better price.
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