Martin-Gatton
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Plant Pathology Fact Sheet **PPFS-GEN-26**

Historical Farm Practices & Their Influence on Disease Management

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Introduction

Modern production practices are often based on techniques used by previous generations or that have been part of cultural traditions for many years. These practices can lead to successful crop production, but they can also influence disease development. An understanding of the relationship between historical practices and their effects on disease development can help improve crop yields while preserving culturally significant traditions. The following summary connects historical practices to plant diseases and their management.

Disclaimer: This summary focuses on plant diseases. Cultural practices such as those described below can influence plant and soil characteristics, soil fertility, and/or ecosystems. Consult a horticulturist for information on best practices for crop production.

Intercropping increases plant diversity resulting in reduced disease and pest risks.

Historical Practice	Description & Purpose	Disease Management Impact
Agroforestry	Utilizing the natural landscape to grow crops. Plants are sown within existing forests, reducing labor and increasing biodiversity.	Trees provide shade for crops and prevent large-scale soil erosion. Crops are less stressed, reducing disease and pest risks. Plant diversity prevents monocultured systems that can result in disease epidemics.
Burning	Removal of crop residues and weeds with controlled fires; also replenishes nutrients and reduces pest populations.	Heat from fires can kill disease-causing pathogens and pests on soil surfaces. However, heat may not penetrate depths to reach all soilborne pathogens.

Historical Practice	Description & Purpose	Disease Management Impact
Cover crops	Crops such as sweet clover, red clover, mustards, wheat, or rye are planted at the end of a growing season or between crops to protect soil from erosion and to reintroduce organic matter and nutrients to soil.	Cover crops can improve soil, resulting in healthier plants that are less susceptible to disease. Some crops such as mustards can reduce soilborne diseases through biofumigation. Cover crops can also prevent pathogens from splashing onto developing plants.
Crop rotation	Planting crops from different plant families in the same space from year to year. Can be combined with double cropping.	Rotating crops from different plant families limits the build-up of disease-causing pathogens, decreasing disease risk.
Double cropping	Different crops are planted one after another in the same space, resulting in multiple crops per season/year.	Planting crops from different plant families limits the build-up of disease-causing pathogens. Keeping crops in the field eliminates bare soil that is susceptible to erosion.
Intercropping	Producing two different crops in the same space at the same time, often on the same row. Example: seven sisters technique.	Intercropping increases plant diversity in the field. Crops from different plant families increase diversity and reduce disease and pest risks.
Irrigation canals	Digging trenches or ditch systems for water to move through fields. This can also utilize natural rainfall for irrigation.	Trenches and canals for water movement improve soil drainage. This prevents standing water that can increase the risk of disease.
Migration planting	Timing planting and harvest on migration patterns of birds or other animals tracks progression of the seasons and cyclic weather patterns. This can delay planting in spring and help avoid frosts and freezes.	Delayed planting results in warmer soil, often avoiding soilborne diseases. Modern forecasting is more effective in predicting weather events, and low-cost tools are available to monitor soil moisture and temperature.
Mound building	Moving soil into round or rectangular mounds to plant crops in raised beds.	Mounds improve drainage, eliminating standing water that can increase disease risk. Raised beds/rows are similar to mounds and may be easier to work with modern equipment.
Non-mechanized equipment	Farming operations performed without the aid of machines. Mechanized equipment promotes farm expansion and is needed for large-scale production. Equipment can be expensive, and small-scale farmers may not have access to funding. Growers may also choose to utilize non-mechanized practices.	Hand tools are versatile and prevent mechanical damage to plants in small spaces. This maintains plant health and reduces disease. Mechanized equipment, however, increases consistency and provides alternatives for specialized spraying. All types of tools and equipment should be cleaned and sanitized to prevent disease spread.
Permaculture	Planting crops to mimic the natural ecosystem, including a specific focus on increased organic matter in soils. This practice requires a knowledge of the native environment. Practices can include no-till or minimal till.	Diversity of plants in one planting area can reduce the risk for diseases and pests. Healthy soils increase biodiversity and reduce diseases and pests. Soilborne diseases may build up in no-till systems without implementation of crop rotations.

Historical Practice	Description & Purpose	Disease Management Impact
Plant thinning	Removal of some seedlings reduces overall stand count and plant density, providing more space for individual plants and reducing competition for water and nutrients.	Proper plant spacing leads to improved air flow and reduces humidity around plants. Low humidity conditions reduce risk for disease development.
Salting	Salt scattered in or around fields prior to planting to ward of malevolent spirits.	Salt inhibits plant and microbial growth. If salt is scattered away from field edges, it can reduce weeds that transmit diseases and pests. Salt can kill or cause damage to crops, leading to higher disease risk.
Seed saving	Seeds collected to preserve heirloom cultivars and/or reduce costs. Many heirloom seeds are only available through heritage collections and must be saved.	Seeds saved from healthy, disease-free plants are less likely to transmit seedborne pathogens. Saved seeds can also be treated with bleach or hot water to reduce internal and external pathogens.
Succession planting	Staggering the planting date of the same crop throughout the season.	Succession planting results in staggered harvests. Losses from one crop may be replaced by successes in others. Postharvest disease losses may be reduced due to reduced time in storage.
Terracing	Amended slopes create flat areas that resemble steps, maximizing farmable land, improving drainage, and reducing erosion.	Improved drainage reduces conditions that favor many soil-borne diseases.

UK Resources

- Plant Pathology Extension Publications https://plantpathology.ca.uky.edu/extension/publications
- Basics of Biofumigation (CCD-FS-20) https://ccd.uky.edu/sites/default/files/2024-12/ccd-fs-20_biofumigation.pdf
- Cleaning & Disinfecting Hand Tools & Planting Supplies (PPFS-GEN-17) https://plantpathology.ca.uky.edu/sites/plantpathology.ca.uky.edu/files/PPFS-GEN-17.pdf
- Disease Management Practices for Saved Vegetable Seeds (PPFS-VG-09) https://plantpathology.ca.uky.edu/sites/plantpathology.ca.uky.edu/files/PPFS-VG-09.pdf
- Postharvest Disease Losses in Fruit & Vegetable Crops (PPFS-GEN-24) https://plantpathology.ca.uky.edu/files/ppfs-gen-24.pdf

Additional Materials

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