



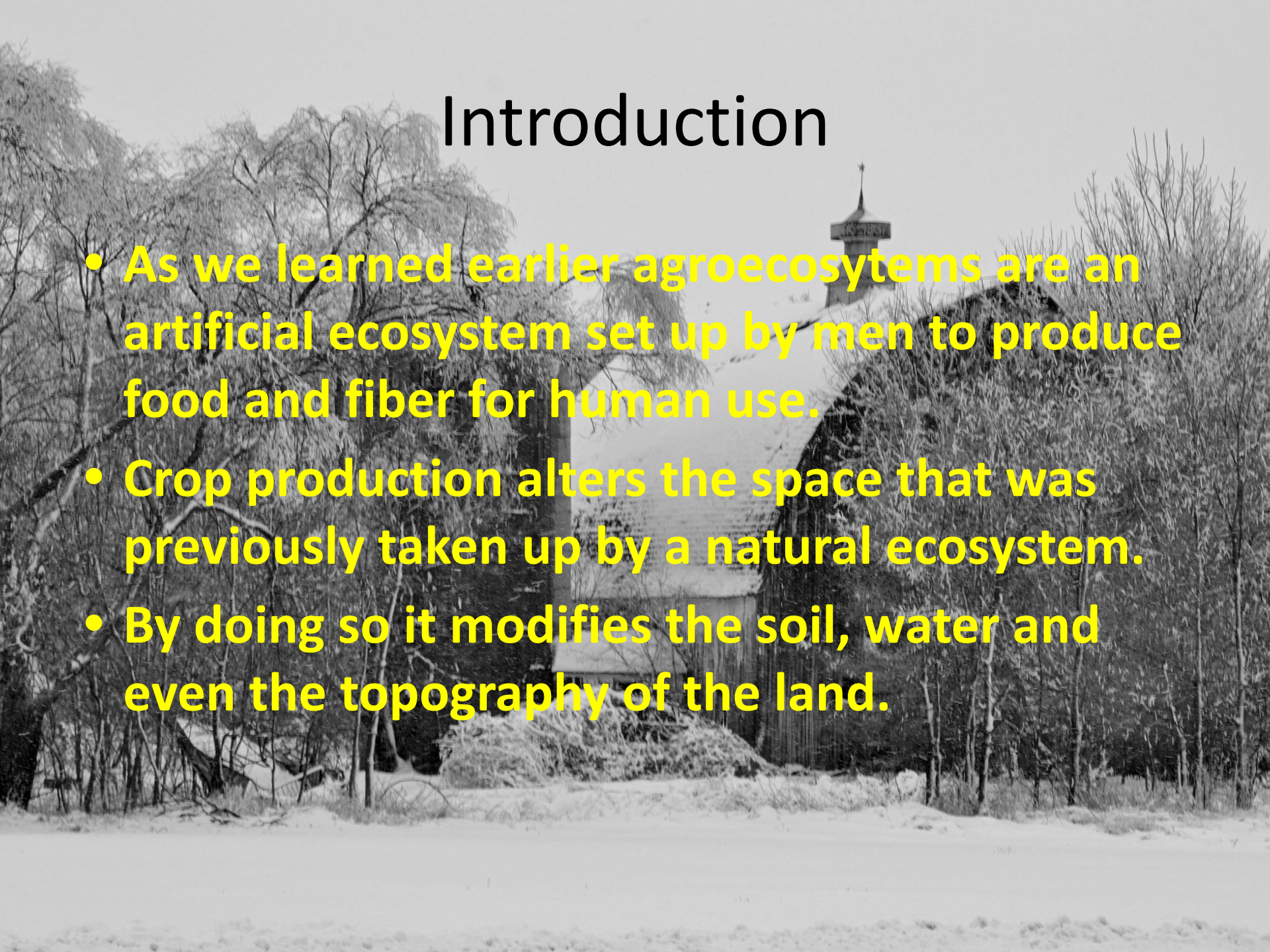
Cultural control of pests

HORT378

Integrated Insect and Disease
Management

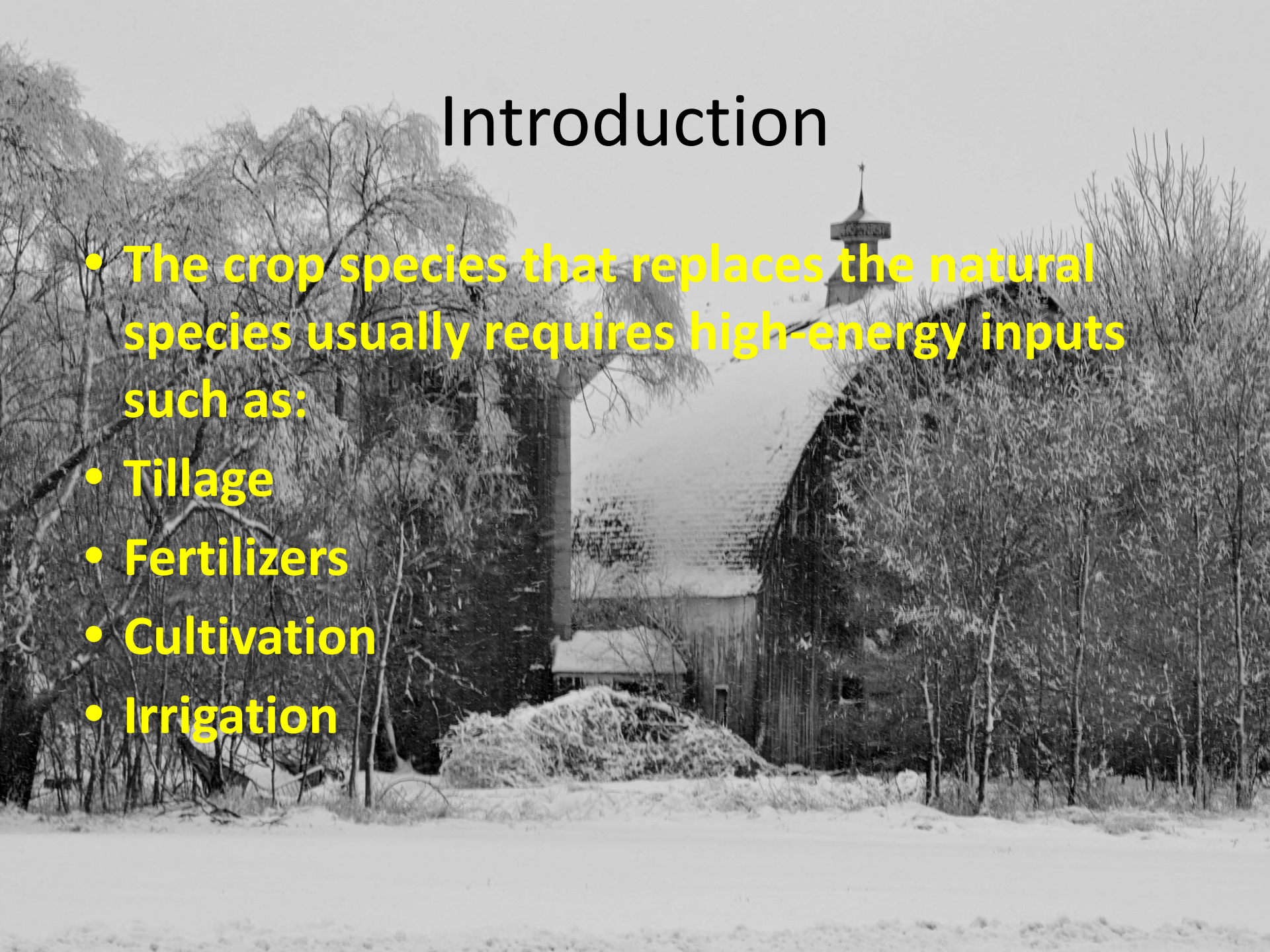
Introduction

- **As we learned earlier agroecosystems are an artificial ecosystem set up by men to produce food and fiber for human use.**
- **Crop production alters the space that was previously taken up by a natural ecosystem.**
- **By doing so it modifies the soil, water and even the topography of the land.**



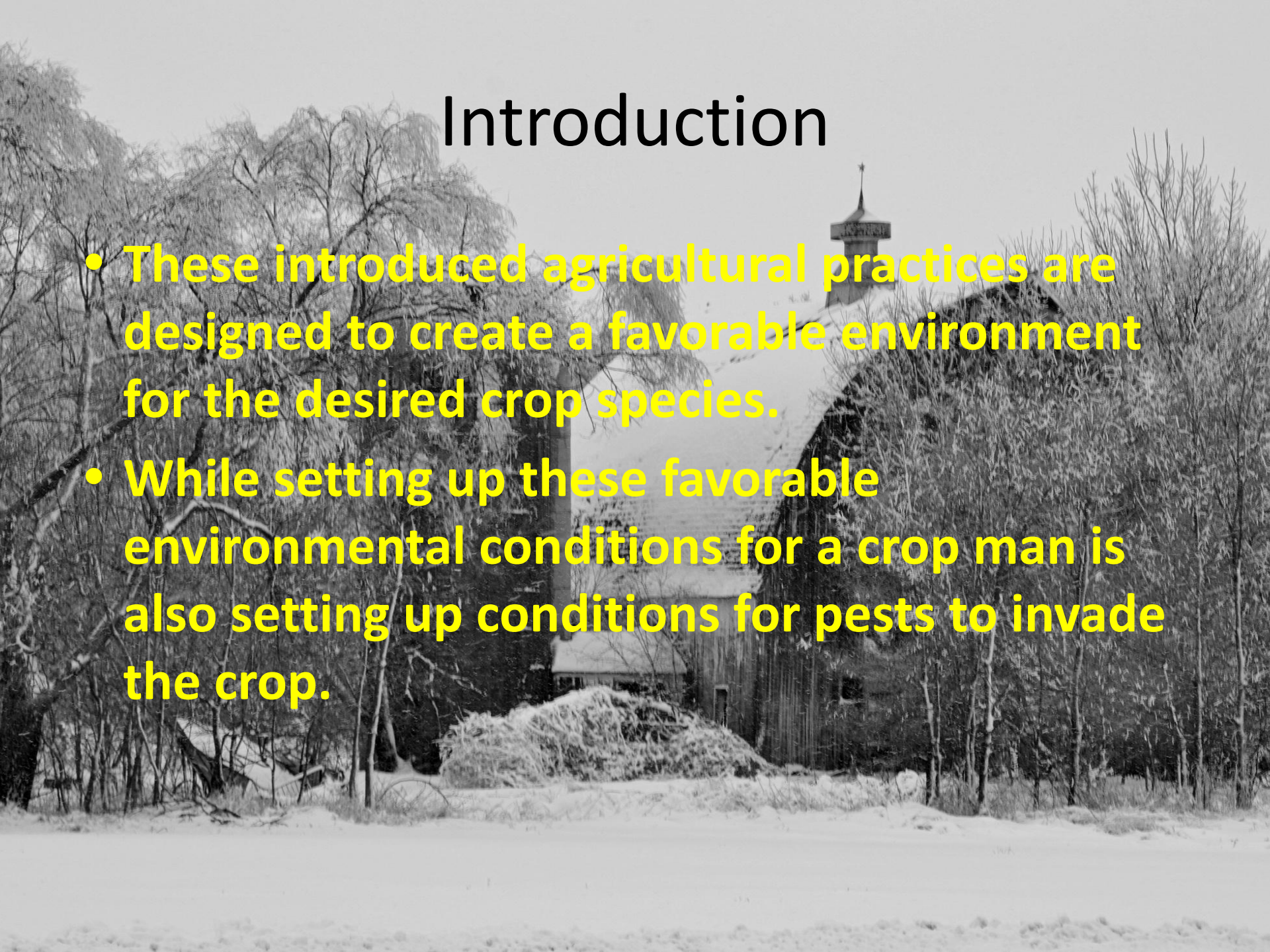
Introduction

- The crop species that replaces the natural species usually requires high-energy inputs such as:
 - Tillage
 - Fertilizers
 - Cultivation
 - Irrigation



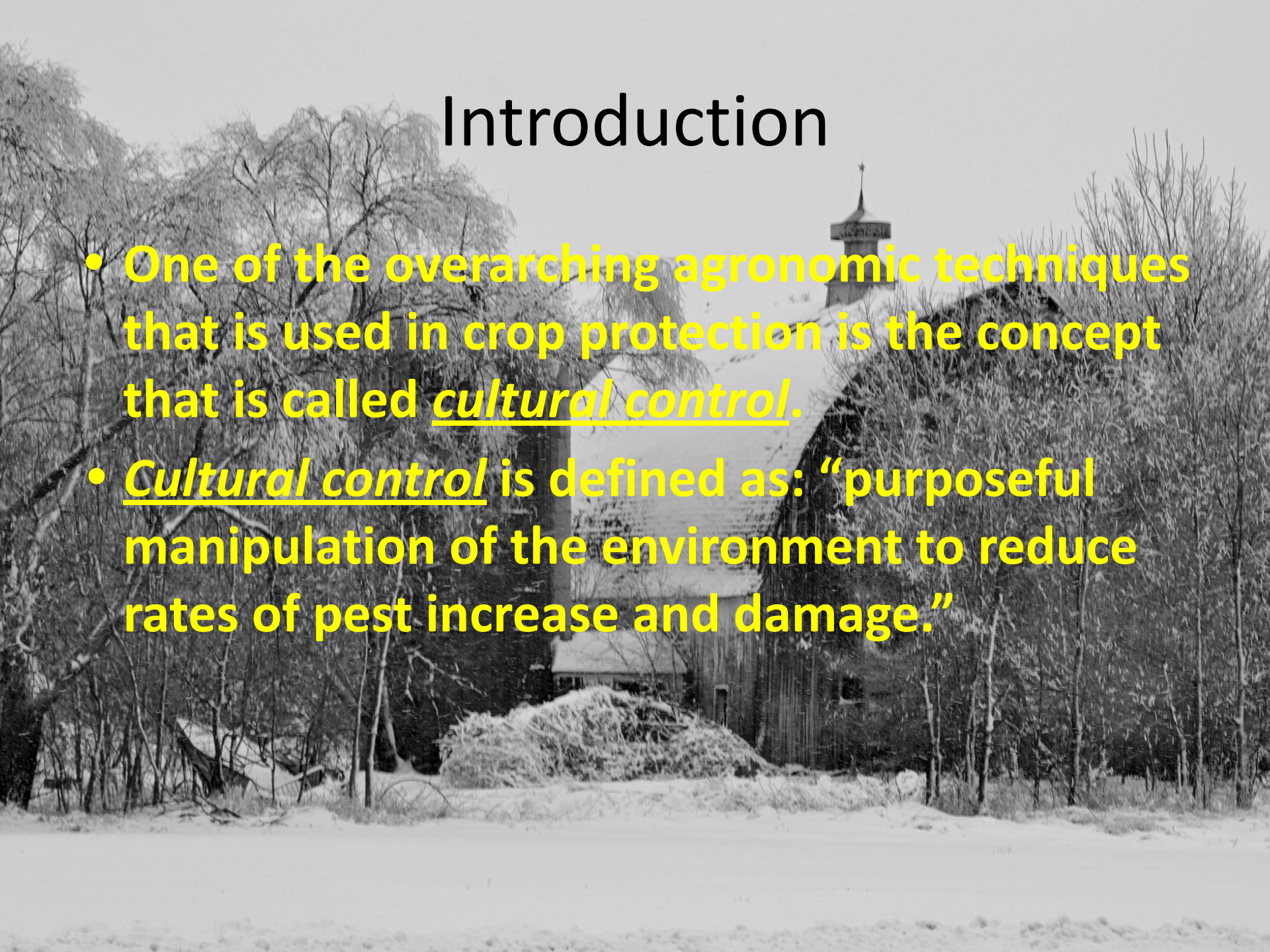
Introduction

- These introduced agricultural practices are designed to create a favorable environment for the desired crop species.
- While setting up these favorable environmental conditions for a crop man is also setting up conditions for pests to invade the crop.



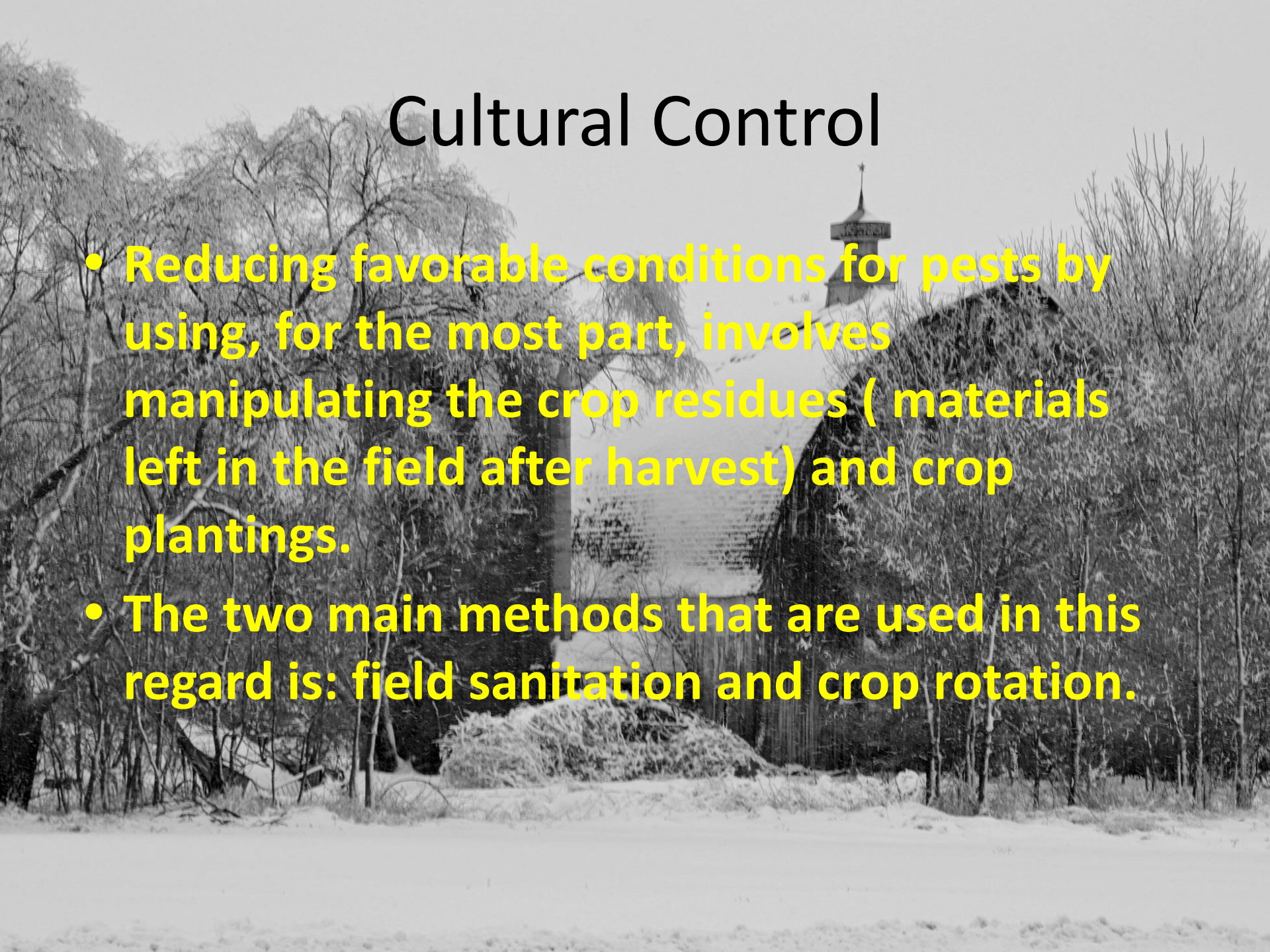
Introduction

- One of the overarching agronomic techniques that is used in crop protection is the concept that is called cultural control.
- Cultural control is defined as: “purposeful manipulation of the environment to reduce rates of pest increase and damage.”



Cultural Control

- Reducing favorable conditions for pests by using, for the most part, involves manipulating the crop residues (materials left in the field after harvest) and crop plantings.
- The two main methods that are used in this regard is: field sanitation and crop rotation.



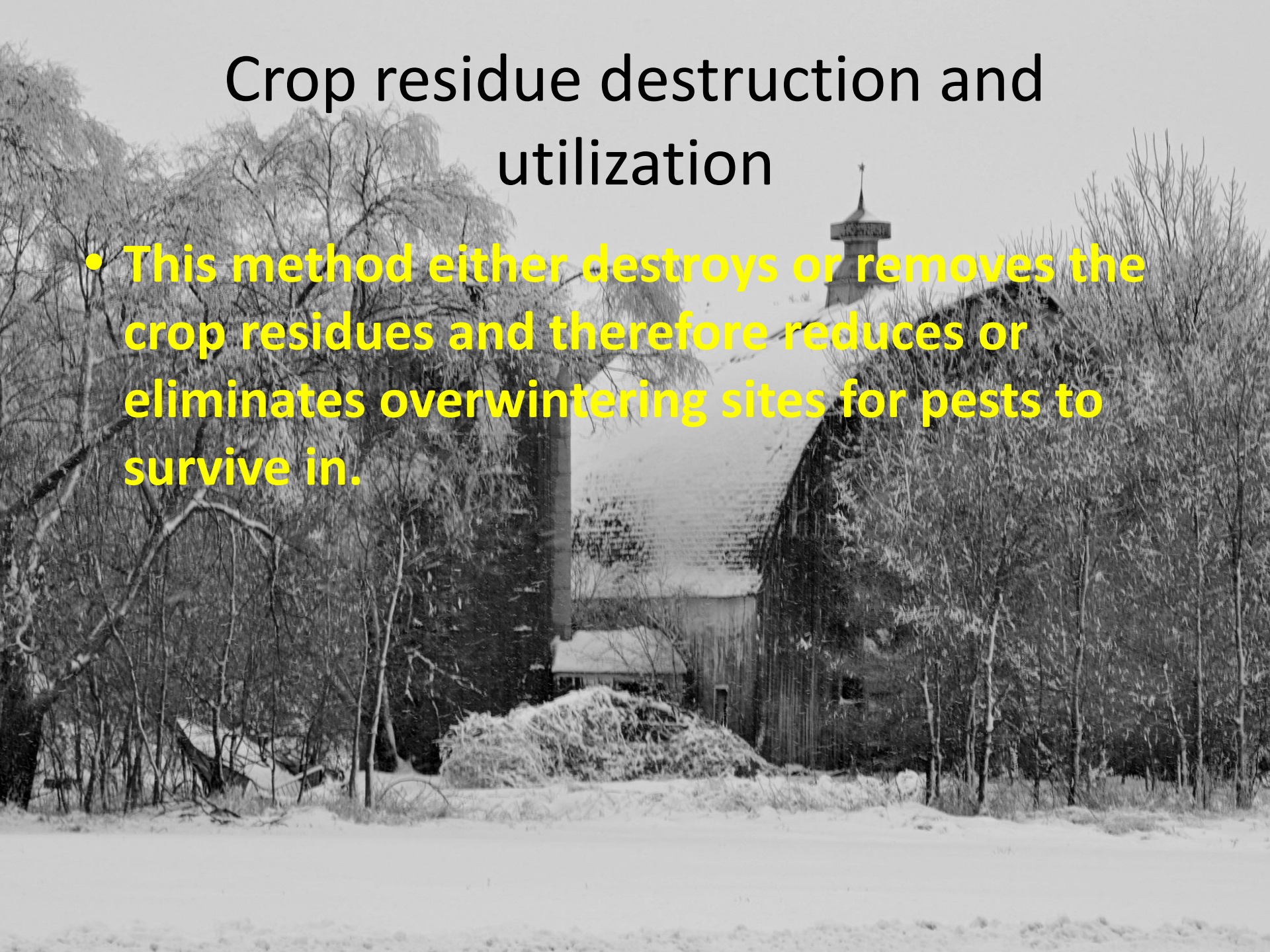
Field sanitation

- **Field sanitation is one the most basic methods in reducing pest species while at the same time, in most cases, preparing the field for next the planting season.**



Crop residue destruction and utilization

- This method either destroys or removes the crop residues and therefore reduces or eliminates overwintering sites for pests to survive in.



Crop residue destruction and utilization



- **Plowing/tillage**

- Preparing the seedbed for planting and weed control

- Method of choice (most commonly used) for the elimination of crop residues for harboring pests.

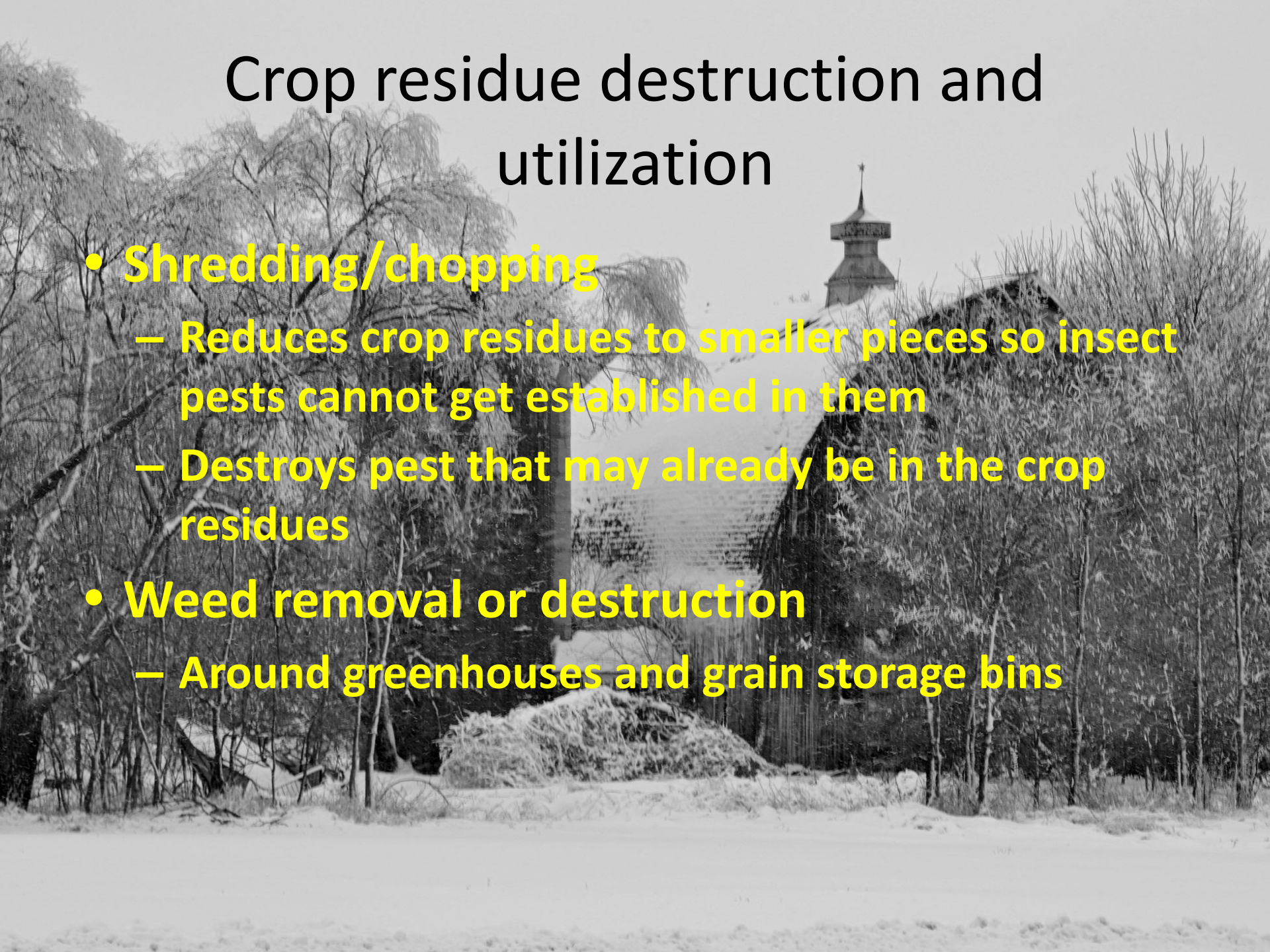
- **Burning**

- Used to destroy plant material around the borders of fields in the fall.

- Reduce crop residues

Crop residue destruction and utilization

- **Shredding/chopping**
 - Reduces crop residues to smaller pieces so insect pests cannot get established in them
 - Destroys pest that may already be in the crop residues
- **Weed removal or destruction**
 - Around greenhouses and grain storage bins



Crop rotation

- It is a technique that controls pests in one crop while it is not a pest in another.
- The practice of crop rotation came about as a method to improve soil workability and fertility.
- It is the practice of planting two or more crops in some sort of sequence in the same field that changes from year to year.

Crop rotation

- One of the most common crop rotation methods that is used here in the Mid-West is the corn/soybean rotation.
- This helps control the pest corn rootworm.
- This pest, while in the larvae stage, exclusively eats the roots of developing and growing corn plants.

Crop rotation

- With a 2 –year crop rotation schedule of corn followed by soybean it has virtually eliminated the corn root worm problem.
- When soybeans are planted the corn rootworm cannot survive, because its food source has been removed.



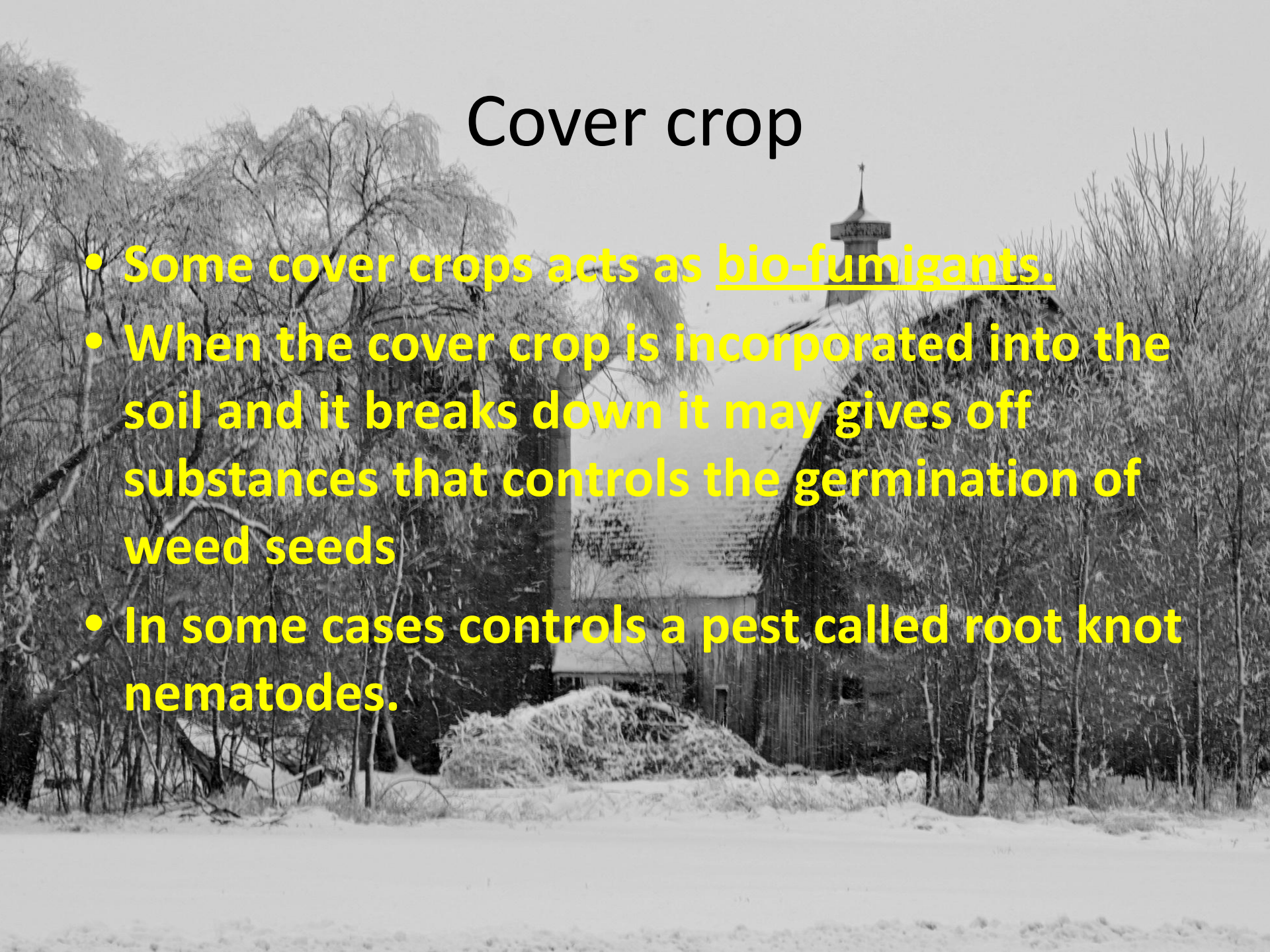
Cover crops

- A cover crop is a plant that is seeded to cover the ground from one season to the next.
- It protects the soil from erosion.
- Source of organic material for the next cropping season when worked into soil.
- Controls the growth of winter weeds on the soil.



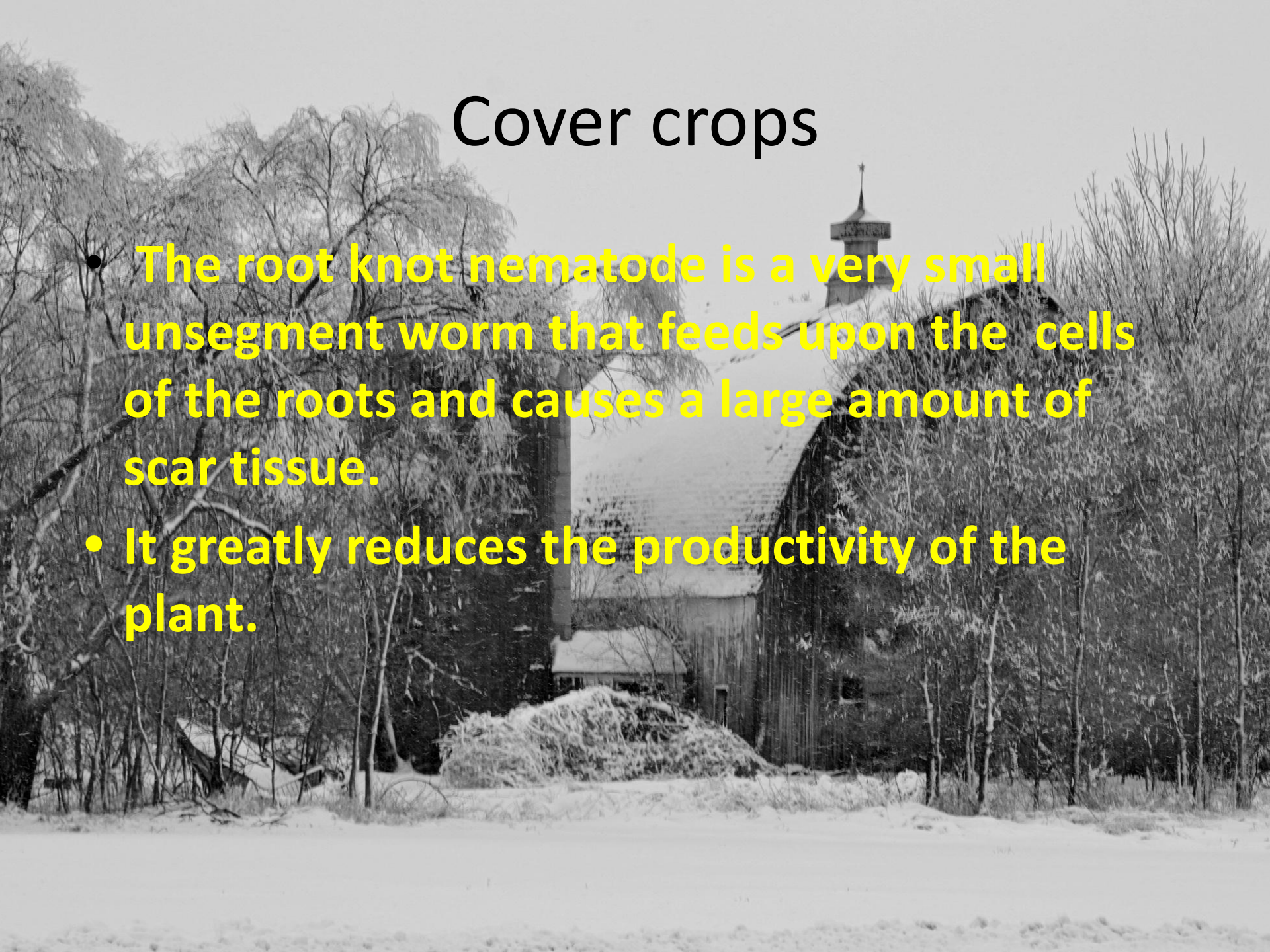
Cover crop

- Some cover crops acts as bio-fumigants.
- When the cover crop is incorporated into the soil and it breaks down it may gives off substances that controls the germination of weed seeds
- In some cases controls a pest called root knot nematodes.



Cover crops

- The root knot nematode is a very small unsegmented worm that feeds upon the cells of the roots and causes a large amount of scar tissue.
- It greatly reduces the productivity of the plant.



Cover crop



Cover crops

