Weed Management

Getting the most out of unwanted plants

Objectives

- Assist identification of common weeds
- Provide detailed methods for eradication, prevention and usage of weeds
- Provide info on the history of weeds and their role in farm ecology

What is a weed?

Basic definition - any unwanted volunteer plant that reduces the production of a crop.

Long and Short of it: Increasingly difficult to answer and depends on who you talk to.

Another Definition

A weed is any plant, native or non-native, that interferes with crop production by doing more harm than good and has a habit of encroaching where it is not wanted.

What is a weed?

Complex Definition - "weeds" vs Weeds. most weeds are what ecologists call early successional plants or pioneers. they are tasked with covering the soil and taking up soluble nutrients. This prevents soil degradation and adds carbon and shade, allowing mobile biology to exist. Early succession sets the stage for more complex systems (forests, grasslands, wetlands) to evolve and stabilize.

"weeds" - abundant, underutilized plants with some beneficial characteristics

Weeds - abundant, invasive plants with no apparent benefits and some unwanted characteristics (poisons, heavy nutrient feeding, dense foliage/roots)

A few terms

Native - Plants that are part of the wild, undisturbed food web and have functional roles in an ecosystem. May be abundant or scarce.

Invasive - abundant plants with high reproductive success apparently regardless of conditions. May be native, or exotic.

Exotic - immigrant plants from other parts of the world that may be grown in season or become naturalized or invasive.

Naturalized - immigrant plants that are not necessarily invasive and may perform an ecological function in place of a native plant

A few terms

Seed Bank - Not all seeds germinate after being scattered. They remain viable in the soil for long periods of time under the right conditions.

Weed Management - a mix of eradication, prevention and usage. Making weeds work for us as much as possible.

Eradication - complete elimination of growing weeds and their seed bank.

Prevention - stopping germination of the seedbank

Usage - Harvesting plants for a purpose and and allowing them to reproduce or remain viable. Providing food or shelter.

Negative effects of weed colonization

Competition - Weeds occupy valuable space and compete aggressively for light, air, nutrients and water. Weeds close to crops will reduce crop quality and viability. These effects are functions of proximity to the crop, and the density of colonization.

Allergen production

Increased Habitat - Vegetation provides a place for pests to lie in wait.

Interference - Weeds can make cultivation and harvest a more difficult task when using machinery

Positive Effects of Weed Colonization

Soil cover - Foliage shades the soil and builds organic matter over time, preventing evaporation and erosion. Roots penetrating the soil can break up compacted areas and allow water to penetrate more easily.

Nutrient holding - bare soil is subject to leaching of soluble nutrients, weeds take these up rapidly and then release them back to the soil at the end of season.

Indicators of soil quality - All common weeds have preffered soil conditions which trigger their germination. Some prefer poor soil, other very rich or overfertilized

Nutrient Cycling - the nutrients held can be taken in by foraging animals and transported.

Increased Habitat - with foliage cover comes a better habitat for soil biology like insects and fungi. More diverse soil life can hold more nutrients and water and can produce cold CO2 for direct uptake by plants again.

Common Midwestern Agricultural Weeds

Mugwort

Hemlock

Ragweed

Common Dock

Weeds

Mugwort

-Aggressive, quickly spreading,

- Exotic

-Flavoring herb, insect repellent,

-Toxic in high doses

Weeds

Hemlock

-Aggressive, but easy to eradicate if prevented from seeding

- Poisonous to ingest, some may be allergic to the touch

- Exotic

Weeds

Ragweed

- aggressive, easy to pull, producing many seeds
- Cultivated by native americans as an oilseed before introduction of corn.
- Native

Weeds

Common Dock

- Large taproot and prolific seed makes eradication difficult.

-May be prevented by chopping during flowering.

-Native

Common Agricultural "weeds"

thistle
dandelion
chickweed
purslane
wild geranium
Stinging nettle
wild chamomile
Lambs Quarters

"weeds"

Thistle -
edible roots
insectary plant
seeds attract birds

"weeds"

Dandelion -

soil builder

edible leaves, flowers and roots

insect plant

Aids in ripening of fruits

"weeds"

Chickweed -

High protein. Edible for humans. Chickens love it.

Shade loving

"weeds"

Stinging Nettle -

Used for nutrient and herbal tea.

Contains Histamine, a compound that creates the stinging feeling

"weeds"

Wild Geranium -

Contains pyrethrin, a popular insecticide

"weeds"

Purslane -

Once a weed, now a valuable salad green

"weeds"

Wild Chamomile

- Used to make nutrient and herbal tea.

Lambs Quarter's

Lamb's Quarters

- Edible for livestock and humans; leaves, shoots, and seeds

Methods of weed management

- Eradication
- Prevention
- Usage

Eradication

- Cutting hoeing,sickling

https://www.youtube.com/watch?v=VYRH5Gn2Wbg

- Pulling - By hand or with machinery(see tillage ppt) http://youtu.be/5Ojl28uJeUo
- Spraying herbicide.
- Flaming http://youtu.be/vDpeHp_98zQ
- Seedbank Depletion

Prevention

Seedbank depletion is the #1 way to prevent weed pressure.

By staying on top of weed production and preventing reproduction, we are able to gradually reduce the rate of weed colonization in our soil.

Mulching - A heavy layer of raw, undecomposed organic material will prevent light from penetrating the soil and alerting seeds to germinate. With successive years of mulching, layers of decomposed organic matter are built up, burying weed seeds.

https://www.youtube.com/watch?v=wffoeYUFK7k

Seed Bank Depletion

Cover cropping - once staple crops have been harvested, planting of second, less productive but hardier crop follows.

https://www.youtube.com/watch?v=jl7wncXBY0w

Polyculture - a system where multiple crops are planted in a space. They are chosen because they are mutually tolerant or beneficial. Plant density is increased and soil is covered so weed germination is decreased.

Seed Bank Depletion

Careful composting - Getting compost piles above 140 degrees Fahrenheit will decompose weed seeds.

Tool cleaning - Soil is the biggest importer of weed seed. Remove it between using tools in different areas.

Daily inspection - By far the most important action against weed pressure.

Usage

The majority of plants have some uses:

Biodynamic preparations - Nutrient teas and insect repellent sprays for crops can be made with various weed.

Compost - Adding weeds to compost both inoculates it with soil biology and adds to the nutrient content.

Animal shelter and forage - Most plants can be eaten by something or at least provide shade

Soil cover - Aggressive grasses can be cut frequently to provide mulch. Fallow or unplanted fields should have something growing on them in order to hold nutrients

Food- Many weeds are edible.

Moving Forward with Permaculture

One of the main principles of Permaculture is that we should use and value diversity and biological resources. Weeds can be an important resources if we learn about them and how to use them. Learning about common plants allows new connections to be made on the farm. We must obtain a yield without damaging our land, and proper weed management is a big part of both.

Self Review

- What is a weed?
- How are weeds dispersed?
- What are some benefits of weeds in a cropping system?
- What are some of the characteristics of weeds that allow them to compete so well in cropping systems?
- Why control weeds?

Resources

- *NRCS Local Extension Office*
- *Good Weed, Bad Weed* by Nancy Gi*ft*
- article “Weed the Soil Not the Crop” by Anne & Eric Nordell
- “You Can Farm” by Joel Salatin
- “Gardening When it Counts” by Steve Solomon