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This presentation is part of an educational modular program designed to provide new and beginning farmers and ranchers with relevant information to initiate, improve and run their agricultural operations

This program is funded by the Beginning Farmer and Rancher Development Program (BFRDP)

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Integrated farms

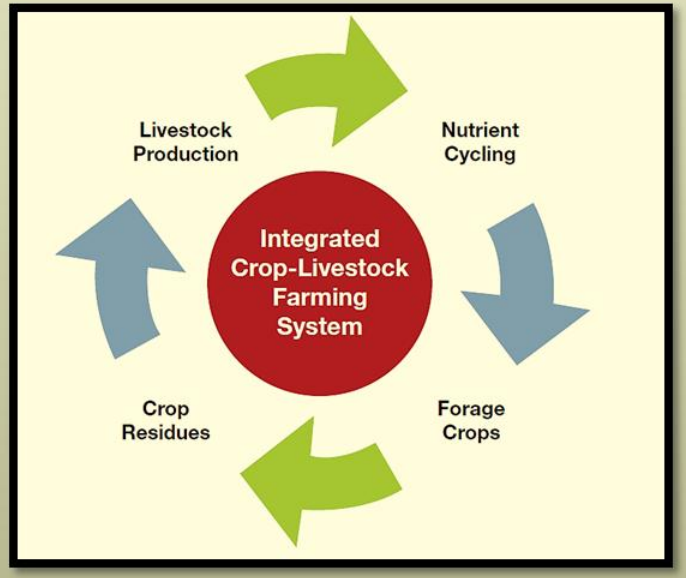
Integrated farms

- In the 20th century, farming saw a gradual separation and specialization of production
- Large intensive farms that are specialized in just one type of crop or animal became the norm
- This change meant that now crops need to be harvested and then transported and transformed into feed that is then transported to the livestock farms

Integrated farms

- A different production model is based in the integrated production of livestock and crops
- In this model, crops and livestock interact to create a synergy with recycling allowing the maximum use of available resources

Manure is used to enhance crop production, crop residues and by-products feed the animals, supplementing often inadequate feed supplies, thus contributing to improved animal nutrition and productivity



Examples of integration of crops and livestock

"Pig tractor" systems where the animals are confined in crop fields well prior to planting and "plow" the field by digging for roots

Results of a "pig tractor" after only one day

Examples of integration of crops and livestock

"Chicken tractor": poultry used in orchards or vineyards after harvest to clear rotten fruit and weeds while fertilizing the soil

Results of a chicken tractor after a few days in the same spot

Examples of integration of crops and livestock

Cattle or other livestock allowed to graze cover crop between crops on farms that contain both cropland and pasture

Sheep grazing the cover crop at a vineyard

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Examples of integration of crops and livestock

Animals grazing in forest areas

Examples of integration of crops and livestock

Goats for clearing land or control weeds

After 3-5 days of goats in a weed infested hill

Examples of integration of crops and livestock

Multi species grazing systems

- This option not only helps to integrate the crops with the animals, but also helps to improve the use of the crops by taking advantages of the different grazing strategies of the different species

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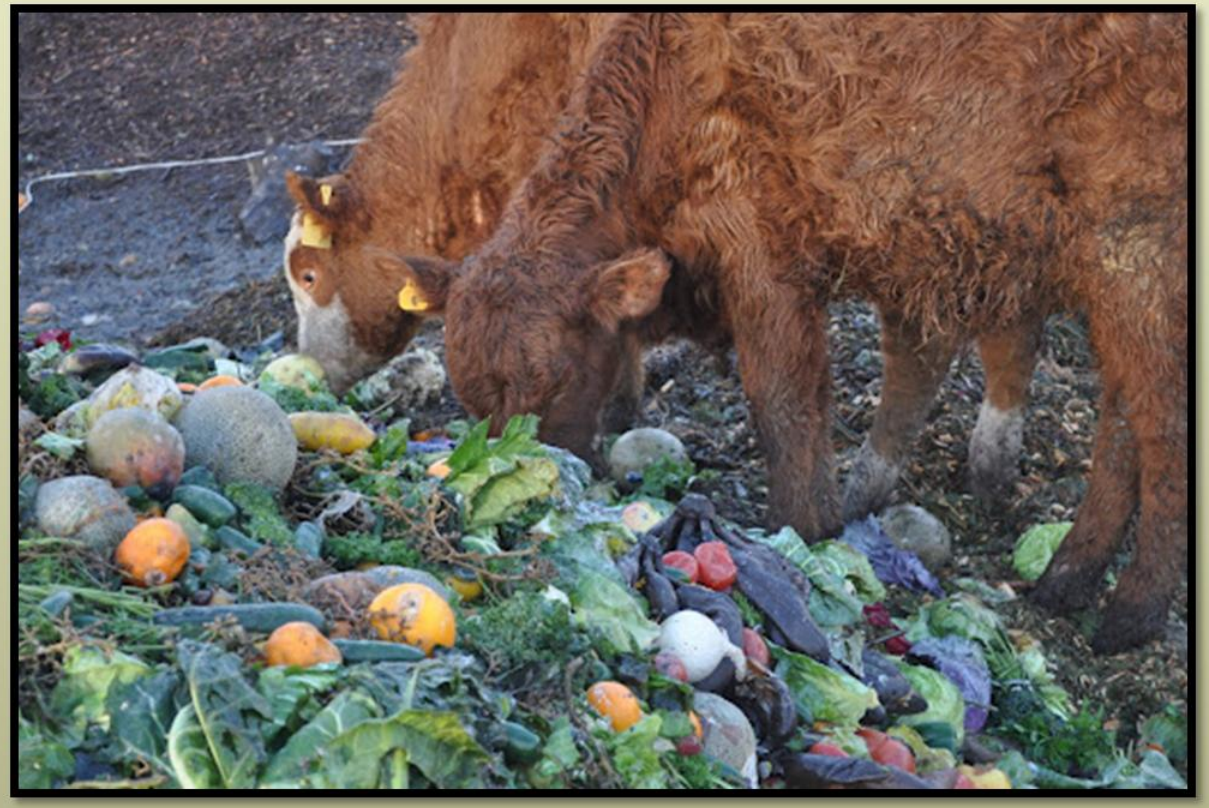
Examples of integration of crops and livestock

Feeding the animals with leftovers or damaged fruits and vegetables



Examples of integration of crops and livestock

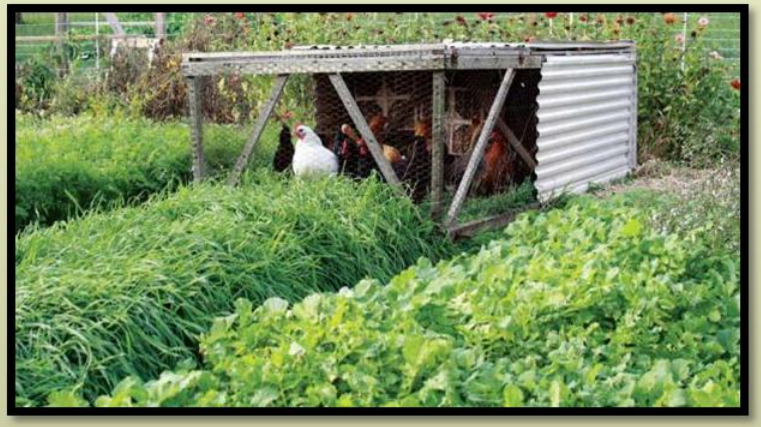
Bee hives kept in the field to pollinate the orchards and crops

- Almost all crops and flowers depend on insect pollinators

A bee hive can produce over 100 lbs of honey a year (if they have enough nectar available), plus they produce propolis, royal jelly and pollen

Integrated farms

- An important characteristic of integrated farms is that all the different subsystems (crops, trees, animals) are part of the same plan



- This is different from diversified systems where the different subsystems coexist in the farm independently from each other

Goals of integrated farming systems

- Year-round income
- Risk avoidance
- Increased input-output efficiency
- Increased productivity and profitability
- Reduced costs in feed and labor
- Year-round employment opportunities

- <u>Also:</u>
  - Reduced use of external inputs
  - Increased efficiency in labor and resources
  - Recycling of resources
  - Increased sustainability
  - Avoiding deforestation

Integrated farms

Examples different production systems included of integrated farms:

1. Crop production (including fruits and vegetables)
2. Orchard
3. Flowers and herbs
4. Fodder production
5. Cattle production (Dairy/Beef)
6. Sheep/goat production
7. Pig production
8. Poultry Production (Dual purpose)
9. Honey
10. Compost/Humus production

Integrated farms
Crops

Fodder	Alfalfa, barley, clovers, brassicas, grasses (native grasses, Bermuda, fescues, orchard grass, ryegrass, timothy grass)
Grain	Corn, wheat, barley, sorghum, millet, oats, rye, buckwheat
Vegetables	Peas, beans, tomatoes, eggplants, bell peppers, potatoes, broccoli, cauliflower, cabbage, onion, garlic, chives, carrot, lettuce, melon, cantaloupe, cucumber, squash, pumpkin
Fruits	Berries, red currants, black currants, grapes, melons, fig
Roots	Beet, rutabaga, carrot, yams, radish, salsify, ginger, sweet potato
Herbs	Culinary herbs like thyme, lavender, parsley, basil, rosemary, bay laurel, dill, or medicinal herbs (St. john's Wort, chamomile, elderberry, primrose, fenugreek, licorice, marigolds, marsh mallow, milk thistle)
Fruit trees	Apricots, cherry, citrus, kiwifruit, pear, apple, persimmon, plum, cashew, peach,
Nuts	Almonds, chestnuts, pecan, filbert (hazelnut), walnuts, pine nut,

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Integrated farms Livestock

The selection of livestock is dependent upon family consumption, potential market and availability of resources

Integrated agriculture
More options

- Agroforestry (timber, nuts, fodder, branches, etc.)
- Forest farming (mushrooms, flowers, herbs, pinecones, ferns, etc.)
- Aquaculture (walleye, bait fishes like shiners and minnows, catfish, bass, shrimp)

Integrated agriculture

Some of the most common combinations are

- Crop-livestock-agroforestry system
- Crop-fish-poultry and agroforestry
- Crop-livestock-poultry- agroforestry system

- However depending of your interests and location you could have any combination

Where do I start?

There are several things that need to be considered before choosing the type of production systems for your farm:

1. Soil and climatic features of the selected area
2. Availability of resources, land, labor and capital
3. Present level of utilization of resources
4. Economics of proposed integrated farming system
5. Managerial skill of the farmer
6. Personal preferences
7. Marketing opportunities

Where do I start?

- Once you have selected the different enterprises that you would like to have, and have a plan for it
- Then you should start with one or two (usually a fodder crop and one type of livestock) enterprises
- Once those enterprises are going then you can start adding another element to the farm that can be connected to the other two (a vegetable patch or an orchard in a field treated with the compost of the animals for example)
- Or start implementing some agroforestry practices that will need attention later on

What do I need?

- In traditional agriculture, labor is usually limited to one or two times in the year, but with so many enterprises going on at the same time, labor will be spread during the entire year
  - You will need reliable labor that can stay with you for long periods of time
  - You will need a year round outlet for your products

What do I need?

- Two of the most essential elements of an integrated farm are PLANNING and ORGANIZATION!
  - You need to be able to know how many animals you will be able to keep before you need to buy more feed
  - You need to plan your weekly and daily activities so that you can oversee all the different elements in your farm
    - There will be time when the crops require more time and other when the chickens need more attention
    - Keep records of everything! It is the only way to know what you have and what you need at any given time in the farm

Integrated farms

- Setting objectives and monitoring the results provide the means by which the performance can be constantly improved and the benefits of this kind of operations can be quantified and demonstrated

- Each different element of the farm has to be monitored in terms of its short and long term objectives:
- Crop production
- Livestock performance and wellbeing
- Market outlets
- Financial considerations
- Environmental considerations
- Family considerations
- Staff training and motivation

Integrated farm

- In reality, few farms reach a high level of complexity and interconnectedness between the different parts of the farm
- In the initial stage of the farm, there are usually many expenses
- It is very labor and time demanding
- Requires planning and organization to run all the different elements of the farm at their prime, and this also is labor and time consuming

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