AGRONOMY & CROP PRODUCTION

BRAINSTORMING QUESTIONS

1. What do you understand about land preparation?
2. With examples, what are the land preparation methods/practices in your operation areas?
3. With examples what are the steps required in the land preparation?
4. What are the tools/equipment used in practicing land preparation ?
5. How are objectives & benefits of early land preparation ?

AGRONOMY & CROP PRODUCTION

DEFINITION:

Land preparation refers to or involves ; bush clearing , removal of tree stamps, termite mounds, and ploughing for uniform and proper growth of roots to absorb the available soil nutrients.

Land preparation includes proven practical techniques such as: -

- Clearing and weeding the field,
- Pre-irrigation,
- First ploughing or tilling,
- Harrowing ,
- Flooding ,
- Levelling .

AGRONOMY & CROP PRODUCTION

Methods of land preparation & related equipment:
Conventional Tillage
Conservation Tillage
Zero Tillage

Conventional Tillage; refers to uses of hand tools animal drawn equipment or mechanized implements to turn over and loosen the soil to allow aeration and water filtration while incorporating the plant residues into the soil .The common equipment used are the disc plough and the mouldboard plough .The Disc plough inverts the soil but breaks it down leaving a rough field. The mouldboard plough also inverts the but more aggressively. Leaving clods of various sizes with residue buried under. Harrowing should be done when necessary.

Advantages of Conventional Tillage

Ploughing helps invert the soils
Harrowing helps break down big boulders into tiny, small boulders for appropriate tilth.
Sub soiling breaks hardpans and manage compaction.
Cultivators mixes soils at the shallow depth and harrows to level the soil surface for a smooth field.
Conventional Tillage achieves a smooth field.
It prevents crop residue from clogging farm implements when planting and weeding.
Conventional Tillage helps to incorporate fertilizers into the soil and control weeds.

AGRONOMY & CROP PRODUCTION

Disadvantages of Conventional Tillage

Enhanced soil moisture loss through exposure to evaporation and run off
Breakdown of soil structure and interference with soil flora and Fauna.
Increased risk of soil erosion because of the loose soil crusting
Increased operating cost because of the numerous

a]**Land harrowing for a fire tilth**

b] **Animal traction ploughing**

AGRONOMY & CROP PRODUCTION

Power Tiller[walking tractor

Tractor ploughing

If ploughing is to be done using oxen or tractor, care must be taken to work the land when it is dry

AGRONOMY & CROP PRODUCTION

Conservation Tillage is the practice of growing crops while minimizing disturbance to the soil. It creates a more sustainable agriculture technology. In Conservation tillage the crop is planted with minimum field tillage using a ripper or a planter. It advances planting of the maize, limits moisture loss and conservers organic carbon and soil fertility through retention of organic matter. When practicing conservation Tillage 30% of crop residue must remain in the field when the new crop is planted. The plant residue acts as mulch and a source of plant nutrients.

Ripper

Planter

AGRONOMY & CROP PRODUCTION

Advantages of Conservation Tillage

Conservation tillage uses less inputs (e.g. fuel time and labor)

It reduces the level of soil disturbance

Maize plant residues act as Mulch that reduces

Mulch encourages roots and earth worm canals in the soil that allow for water penetration and water storage in the soil profile, Retention of maize stoves retains water. It reduces runoff.

Reduced cultivation method for maize planting using herbicides and chisel ploughing has shown that you can get more for less. This involves the following practices:

AGRONOMY & CROP PRODUCTION

- Allow weeds to germinate and emerge after the first rains
- Chisel plough or rip on the row to break the plough pan compaction layer.
- Spray to kill weeds
- Hand plant the seeds along the ripped lines using optimum fertilizer placement and spacing.
- Apply preemergence herbicides immediately after plants emerge. Weed between rows with minimal soil disturbance
- In the following season plant the new crop rows between the old crop rows.

AGRONOMY & CROP PRODUCTION

Frequently Asked Questions about Conservation Tillage

Won't compaction result from not breaking up the soil which will in turn impair root penetration? *When drilling for planting sufficient loosening of the soil is achieved. Conservation tillage reduces the use of heavy machinery this reduces the risk of compaction.*

Doesn't the presence of Stover/stalks impair the use of machinery in the field? *The stovers are arranged in neat rows that leave space for planting and movement. With Conservation tillage minimal machinery is required in the field.*

Will the maize stovers not act as a reservoir for pests and plant pathogens? Conservation tillage encourages superior husbandry that takes correctional measures on pests and diseases.

Will the method not junk farm Machinery on which heavy capital investment has been spent*? The machinery can be used in other operations like spraying, harvesting and transport.*

Does Conservation tillage not require the technical know-how to be beneficial*? All farming methods need good technical know-how to be effective.*

AGRONOMY & CROP PRODUCTION

Zero Tillage According to Wikipedia No-till farming (also known as zero tillage or direct drilling) is an agricultural technique for growing crops or pasture without disturbing the soil through tillage. No-till farming decreases the amount of soil erosion tillage causes in certain soils, especially in sandy and dry soils on sloping terrain.

AGRONOMY & CROP PRODUCTION

Tips for Effective Zero Tillage

- Use certified seeds that have been treated with insecticides and fungicide.
- There should be sufficient moisture in the soil at the time of sowing to promote germination
- Use special equipment to drill in seed and fertilizer or planting can be done by hand

AGRONOMY & CROP PRODUCTION

Why do proper land preparation?

- It is important to prepare the soil properly to ensure good germination of your seeds,
- Ploughing exposes harmful pests and diseases in different stages such as egg, larvae, pupae, or adults by exposing them to predators or heat of the sun.
- It also helps to bring nutrients near the soil surface.
- Its improves water and air movement .
- It loosens the soil for easy root growth.
- Furthermore , ploughing helps to mix up organic matter in the soil and to kill weeds.

AGRONOMY & CROP PRODUCTION

BRAINSTORMING QUESTIONS

1. What do you understand about optimum population in plants?
2. With examples, why is the optimum plant population important at your operation areas?
3. What is the optimum plant density ?
4. What are the characteristics of optimum plant population?
5 .What are the factors affecting optimum plant population
6. How to determine Optimum plant population?
7. Optimum economic populations vs. optimum agronomic populations**?**

AGRONOMY & CROP PRODUCTION

DEFINITION:

Optimum plant population refers to or is the number of plants required to produce maximum output or biomass per unit area.

Important of **Optimum plant population**

Optimum plant population is necessary to **maximize net return from corn/crop production**.

- Corn yield increases with a greater plant population and reaches its maximum level at a certain population. Population beyond this level oftentimes results in a yield reduction.
- Optimum plant population in each field depends on realistic yield potential and yield goals.
- Optimum economic population is different than optimum agronomic population and is usually several thousand fewer plants per acre. Farmers should focus on the optimum economic population rather than agronomic population to maximize the net benefit.

AGRONOMY & CROP PRODUCTION

Optimum plant density is the minimum population that produces maximum yield) and suitable plant arrangement per unit area allow crops to exploit resource optimally and produce high yields

Characteristics of optimum plant population

varies markedly with **available water, plant height, tillering ability, and fertility**. In varieties that tiller well, plant population is less important than with maize, since the plants can compensate for overly low or high populations by varying the production of side shoots**.**

AGRONOMY & CROP PRODUCTION

factors affecting optimum plant population

Many factors influence the optimum plant population for a crop: availability of water, nutrients and sunlight; length of growing season; potential plant size; and the plant's capacity to change its form in response to varying environmental conditions (morphological plasticity

AGRONOMY & CROP PRODUCTION

How to determine Optimum plant population

Optimum plant population is not a fixed number and can be affected by many factors. A better understanding of these factors helps to determine a meaningful population to achieve maximum yield. Major factors affecting optimum plant populations follow:

AGRONOMY & CROP PRODUCTION

***Hybrid selection*:** Modern hybrids have greater genetic potential and stress tolerance compared to the older hybrids, higher plant populations are needed to fully capture the benefits of the improved genetic potential of modern hybrids

***Planting date*:** Some growers may think higher plant population may compensate for the delay in planting. However, long-term studies conducted in the Midwest has shown there is a weak relationship between planting date and optimum plant population. In other words, the optimum plant population does not change significantly between early and late planting dates. Research conducted in Indiana (Nielsen et al., 2019), Ohio (Lindsey et al., 2015), Illinois (Nafziger, 1994), and Minnesota (Van Roekel & Coulter, 2011) concluded there was little reason to increase seeding rates if planting is delayed.

***Soil moisture availability*:** yield is greatly influenced by soil moisture availability thus higher yields can be expected when soil moisture is not limited. When adequate soil moisture is available to plants, either via irrigation or timely rainfall, grain yield generally benefits from an increase in plant population. Therefore, optimum plant populations are higher in irrigated conditions compared to dryland conditions .

AGRONOMY & CROP PRODUCTION

- ***Productivity level*:** Realistic yield goals are one of the major factors affecting corn optimum plant population. Optimum plant population in a low-yielding environment is considerably lower than the optimum population in a high-yielding environment . Optimum population should be determined based on realistic situation of the field in terms of productivity level. Realistic expected yield, thus the optimum plant population for a given farm is determined by the soil and environment conditions and also the level of management. As a general rule of thumb, the higher yield expectation, the higher plant population required

AGRONOMY & CROP PRODUCTION

Optimum economic populations vs. optimum agronomic populations

Optimum agronomic population refers to the population that produces the highest grain yield. No yield benefit should be expected beyond this population. Optimum economic population, however, is the population that generates the highest net economic return. While optimum agronomic population depends only on yield, optimum economic population also considers the seed cost and grain price. Therefore, the economic optimum population is always lower than the optimum agronomic populations (usually several thousand fewer plants per acre). Farmers should focus on the optimum economic population rather than agronomic population to maximize the net benefit.

Recommended Spacing

AGRONOMY & CROP PRODUCTION

How to calculate plant population per hectare Or Feddan(Acre)

1.Plant population of crop field is given by multiplying the spacing between plants with the spacing between the rows.

2. The total area of a hectare is 10,000m^2 & Feddan is 4000m^2

3. Divide 10,000 by the result of multiplying the between plant spacing and the between row spacing as below

$$Plant\ population = 10{,}000m^2/\text{Spacing between plants (m) x Spacing between rows (m)}$$

If the between plant spacing of maize is 25 cm and between row spacing is 75 cm, what is the plant population per hectare?

1. First convert cm to m

30 cm = 0.25 m, 90 cm = 0.75 m

2. Multiply between plant spacing and the between row spacing

0.25 m x 0.75 m = 0.1875 m^2

3. Divide area of 1 hectare by 0.1875 m2

10000m^2 / 0.1875 m2 = 53,333 Plants

AGRONOMY & CROP PRODUCTION

BRAINSTORMING QUESTIONS

1. What do you understand by timely planting ?
2. With examples, why is timely planting important at your operation areas?
3. What are the Farmers' capacity to adjust planting dates: a systems' perspective ?
4. What are the factors normally affecting timely planting ?

AGRONOMY & CROP PRODUCTION

DEFINITION:

Timely planting: refers to the aligns crop cycles with favorable climate conditions resulting in higher and generally more stable yields**.**

Important of timely planting;

Specifically , timely planting raises system productivity by:

Mitigating risks of yield losses caused by pushing crop growth in to periods of sub- optimal or extreme weather conditions such as cold and heat waves, drought, or flooding.

Increasing resource use efficiencies .

Allowing more crops to be grown per year on the same land[Acharjee et al.2019].while several studies have analyzed optimum time windows for planting, agroecosystem characteristic and farmers decision processes that enhance or limit the potential to plant crops during optimum time windows have received less attention [Acharjee et al. 2019]

AGRONOMY & CROP PRODUCTION

Below are the Farmers' capacity to adjust planting dates: a systems' perspective

We considered the work of Lescourret et al. (2015) and distinguished two different types of factors: (a) ecosystem factors that operate largely at the landscape level but exert influence on individual farmers' ability to plant on time and (b) social system factors (henceforth "social factors") that operate at the village and household scales and affect farmers' decisions regarding planting times

Ecosystem factors include dynamic factors that change from year to year such as the onset of the monsoon, and pest and disease pressures, but also static factors that remain relatively constant over time such as pre-monsoon ground and surface water availability, and land types (e.g., the position of a plot within the drainage system where water tends to accumulate in lowlands or to runoff in upland areas).

Social factors are mainly associated with input and resource availability. Timely planting requires readily available seed and manure, fertilizer, ox-plough, hoe, tractors for land preparation, and irrigation (e.g., mostly with groundwater, but sometimes also in the form of canal water), in addition to labor and capital to pay for crucial operations. These factors are influenced by household resource endowment, availability of farm machinery, market access, and many others

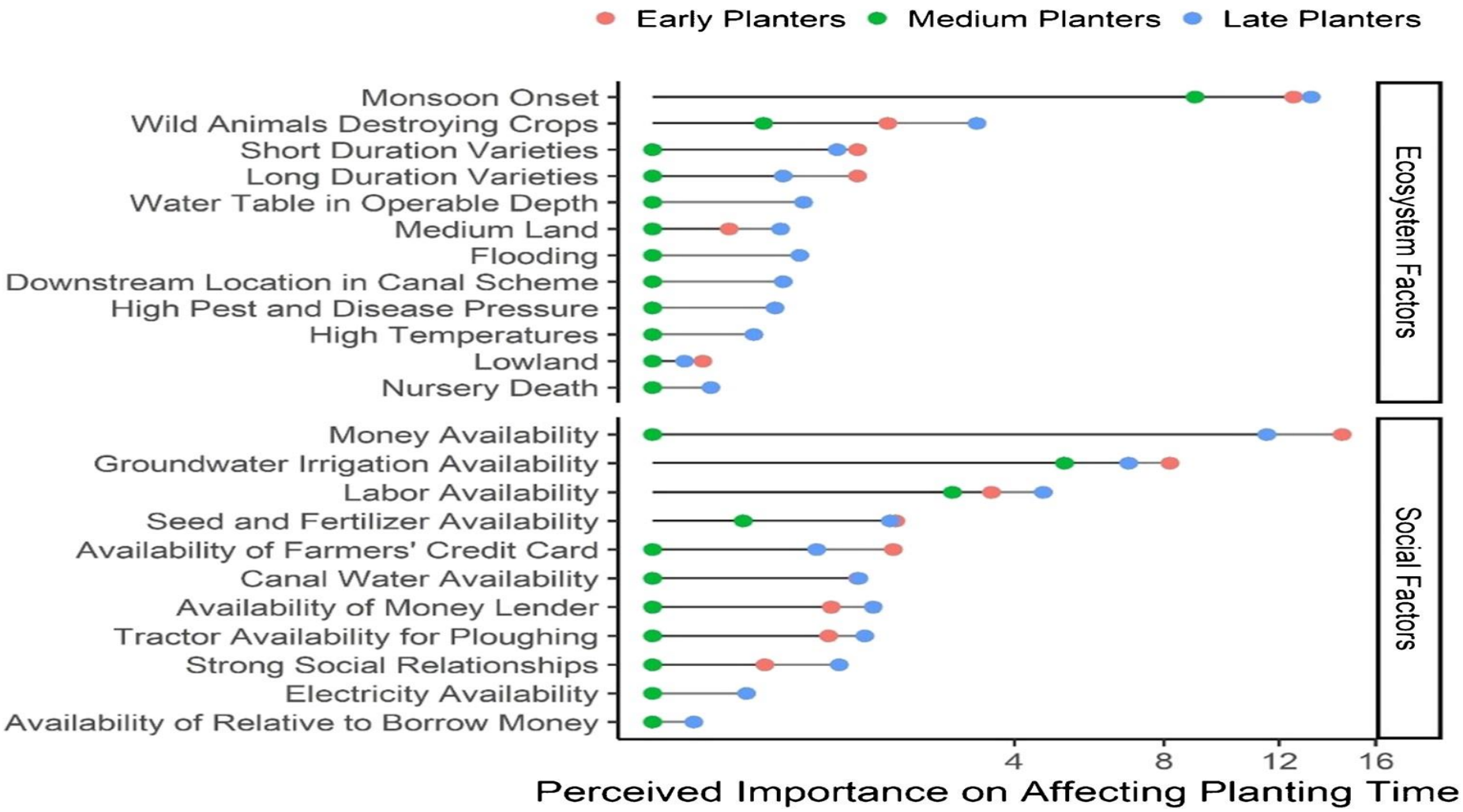
AGRONOMY & CROP PRODUCTION

Since **ecosystem factors** operate largely at the landscape level, they can be regarded as boundary conditions for individual villages and households. Social factors at village and household levels then shape responses therein

Farmers transplanting rice seedlings on July 31, 2017, in the Eastern Gangetic Plains (Bihar, India). Source: Anton Urfels

AGRONOMY & CROP PRODUCTION

The factors normally affecting timely planting



AGRONOMY & CROP PRODUCTION

BRAINSTORMING QUESTIONS

1. What do you understand by intercropping ?
2. With examples, why intercrop?
3. What are the advantages of intercropping and the disadvantages ?
4. What are the different approaches to intercropping ?
5. Why Farmers Practice Intercropping
6. What are the recommendation of intercropping?

AGRONOMY & CROP PRODUCTION

DEFINITION:

I**ntercropping?** ; is a multiple cropping practice involving growing two or more crops in proximity. The most common goal of inter-cropping is to produce a greater yield on a given piece of land by making use of resources or ecological processes that would otherwise not be utilized by a single crop

Inter cropping needs a careful planning wherein the soil, water, climate, light etc are taken into account. While planning inter cropping it is important to select the crops which do not compete with each other for space, nutrient, water or sunlight.

It is advisable to grow crops like shallow rooted crops with deep rooted crops, tall crop with a short plant, shade loving plant with light requiring plants, early maturing crop with late maturing crops etc. Such planning will ensure the added yield advantage for the farmers from multiple crops.

Inter cropping also helps in providing mutual benefits to the crops. For example, growing legumes along with cereals, vegetables will fix atmospheric nitrogen in soil and thereby improving the nitrogen uptake to the adjoining plants.

AGRONOMY & CROP PRODUCTION

Why intercrop?

Stability: Intercropping adds diversity to the cropping system and diversity tends to lead to stability.

Reduced chemical use. Intercropping may allow for lower input levels in a cropping system by reducing fertilizer and pesticide requirements.

Overyielding. Overyielding occurs when the yield produced by an intercrop is larger than the yield produced by the component crops grown in monoculture on the same total land area.

AGRONOMY & CROP PRODUCTION

The disadvantages of intercropping?

It acts as an insurance against failure of crops in abnormal year.

Inter-crops maintain the soil fertility as the nutrient uptake is made from both layers of soil.

Reduction in soil runoff and controls weeds.

Inter-crops provide shade and support to the other crop.

Inter cropping system utilizes resources efficiently and their productivity is high.

)Inter-cropping with cash crops is higher profitable.

It helps to avoid inter-crop competition and thus a higher number of crop plants are grown per unit area.

Inter-cropping gives additional yield income/unit area than sole cropping.

AGRONOMY & CROP PRODUCTION

Disadvantages of inter-cropping?

Yield decreases as the crops differ in their competitive abilities.

Management of /crops having different cultural practices seems to be difficult task.

Improved implements cannot be used efficiently.

Higher amount of fertilizer or irrigation water cannot be utilized properly as the component crops vary in their response of these resources.

Harvesting is difficult.

AGRONOMY & CROP PRODUCTION

The different approaches to intercropping?

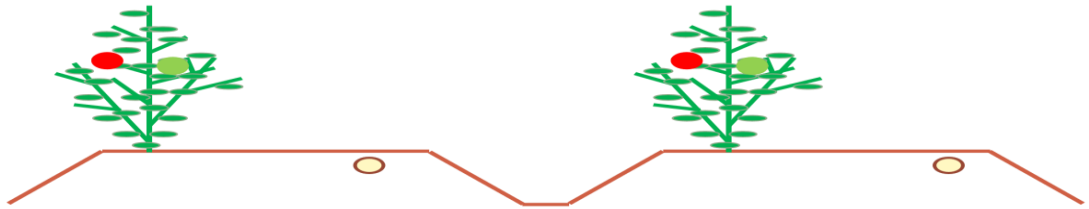
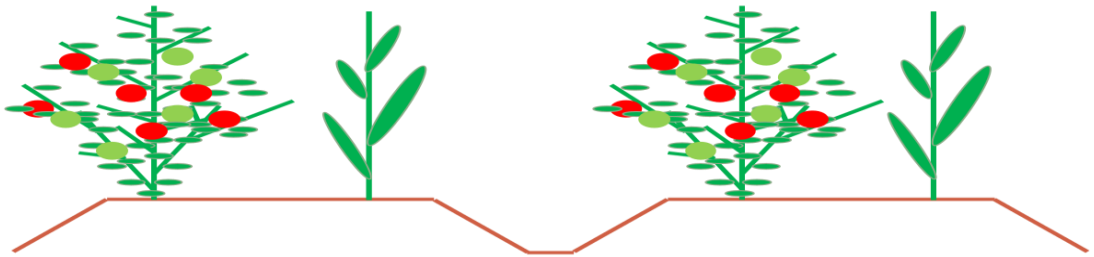
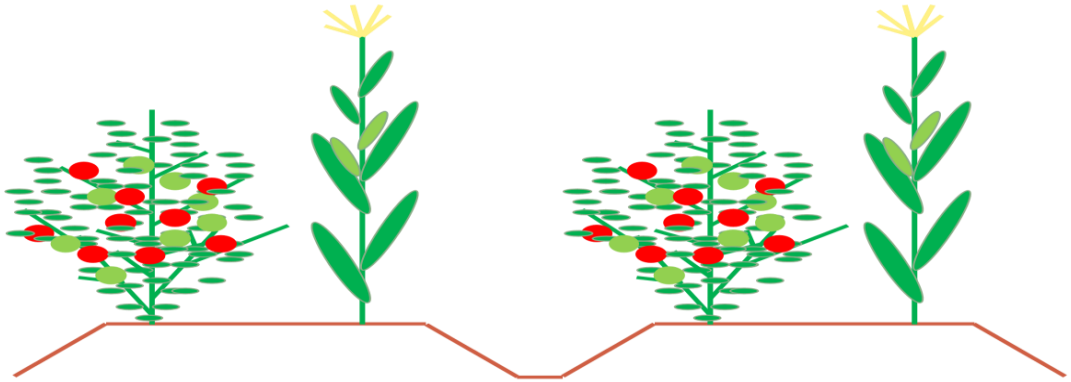
Mixed intercropping – two or more crops are planted in a mix without a distinct row arrangement.

Row intercropping – two or more crops are planted in distinct rows.

Relay intercropping – two or more crops are grown at the same time as part of the life cycle of each i.e. a second crop is sown after the first crop has been well established but before it reaches its harvesting stage.

Strip intercropping – growing two or more crops at the same time in separate strips wide enough apart for independent cultivation.

AGRONOMY & CROP PRODUCTION

Timing	Growth Pattern
1) Transplanting of tomato seedlings on one side * Mid-May	
2) Sowing of maize seeds on other side * Late June	
3) Production of tomato * Two months after tomato transplantation	
4) Production of tomato and maize * Four months after maize sowing * Production of tomato can continue until winter season	

AGRONOMY & CROP PRODUCTION

AGRONOMY & CROP PRODUCTION

- **Why Farmers Practice Intercropping**
- The main motivation behind intercropping is to improve output per hectare but this can only be achieved with careful crop selection and continuous attention to detail.
- There are some farmers who use intercropping to improve the density of the organic material in the rows to reduce soil temperature and retain soil moisture.
- In this case they refer to the secondary crop as live mulching. This means it is important to understand each crop's water requirements throughout the growing season.
- One of the main reasons for intercropping in a commercial enterprise is an attempt to address the need for animal feed, particularly during the dry season.

AGRONOMY & CROP PRODUCTION

Recommendations

Intercropping with common annual crops is feasible and results in overyielding about 75% of the time in conventional production.

The best crop combination tested in this experiment was canola-pea, which over yielded 100% of the time under conventional management.

The poorest combination was wheat-pea, which had problems with weeds and lodging.

In general, increasing the number of crops grown together resulted in better weed suppression.

Including peas in the combination increased grain protein content, resulting in price premiums for wheat.

AGRONOMY & CROP PRODUCTION

BRAINSTORMING QUESTIONS

1. What do you understand by Weed ?
2. With examples, what are the classification of weeds?
3. What are the method of weed control/management ?
4. What are the characteristics of weeds ?
5. What are the weed persistence and competition periods-crop competition ?
6. What are the factors affecting weed seed germination?
7. Why are the strategies for weed success?
8. How are weeds disseminated ?
9. What are the steps of effective weed management
10. What are the adverse effects of weeds?
11. What are the types of weeds found in your area?

AGRONOMY & CROP PRODUCTION

DEFINITION:

Weed can be variously defined as ;

A plant growing where it is not wanted or a plant disturbance of a habitat.

The classification of weeds

Weeds can be classified in the following ways;

Annuals- this require: 1 season to complete life cycle

Biennial- this requires 2 seasons to complete life cycle

Perennial-which require more than 2 seasons to complete life cycle

AGRONOMY & CROP PRODUCTION

Habitat

Terrestrial-disturbed

Terrestrial-undisturbed

Wet lands

Aquatic

Floating hydrophytes have contact with water and air only [e.g water lettuce, pistia, stratiotes.

Emergent hydrophytes have contact with substrate water and air e.g. water lilly

Submergent hydrophytes they are rooted to the substrate but don’t emerge above the water e.g water weed Elodea ssp.

AGRONOMY & CROP PRODUCTION

method of weed control/management?

Preventive –measures taken to prevent the introduction, establishment and a spread of specified weed in non infested areas.

Noxious weeds; is any plant that declared by an authoritative group, with the legal power to make such a declaration to be harmful or posses characteristics

Steps in weed prevention

Use of weed free crops seed/stock

Use of weed free manure and hay

Use of weed free machinery

Don’t allow weed reach stage

Keep surrounding areas weed free

Cultural weed control- using modification in general farming practices to reduce the impact of weed, for example : proper spacing, timely planting, crop rotation, flooding etc.

Mechanical[physical weed control- is the physical energy in the system which includes following types, hoeing, mowing, mulching, tillage/cultivation [tractor implements, application of or exposure to heat etc.

AGRONOMY & CROP PRODUCTION

Biological weed control-this involves altering the ecology introducing natural mortality factors[insects, nematodes, fungi, bacteria] in to population to establish a new ecological component aimed at reducing the impact of a weed species. Done by

Direct action which is by consumption of vital plant parts that weakens the structure or function of weed plant.

Indirect action which is by reducing competition advantage of weeds by reducing vigor or reproductive capacity of weed thus encouraging the crop to out compete the weeds.

Chemical weed control- this is use of chemical in the control of weeds such as herbicides.

Integrated weed management-is a system by which all available tools are used to reduce weed seed bank , prevent weed emergence with other plants and minimize competition

AGRONOMY & CROP PRODUCTION

The characteristics of weeds

Tendency to grow in undesirable locations crop fields, range lands/pastures, roads sides pavement etc.

Have competition and aggressive habit better at acquiring resources needed by crops

They are resistant persistent to control and eradication measures

Have wild and rank growth i.e. they have high growth rates, large in size and can cover extensive area.

They have high reproductive capacity i.e. they produce large quantity of seeds

Can grow in large population and therefore out compete crops of interest

Harmful to human , animals, and crops , many weeds are poisonous alkaloids, thorns and toxins e.g. leaves of stinghtly nettles.

AGRONOMY & CROP PRODUCTION

Weed persistence

The ability of weeds to persist in any environment is dependent on climate, soil and biotic factors.

Climatic factors such as light , temperature, moisture and wild affect weed germination, seedling growth and development, reproduction and seed dispersal. Weeds will fail to compete their life cycle when one or more of these environmental factors becomes limiting. The distribution, duration and total and total rainfall determine to a large extent the types of weeds that will grow in a given location. Light quality , intensity and reproduction. Soil fertility and characteristic influence weed distribution similarly , they type of animal and crops that occur in a given location affect the weeds that colonize the area

weed free period –this is the time that the crop needs to be weed free to show no detrimental effect on yield [immediately after emergence.]

Weed competition period-this is the amount of time the crop can compete with weeds and suffer no loss in yield . Weed free period varies with crops**.**

AGRONOMY & CROP PRODUCTION

Crop	weed free periods[wks.]
Cotton	6-8
Peanut	6
Maize	4
Onions	12
Tomatoes	4-8

the factors affecting weed seed germination

Burial depth- when the seed size is greater than the depth then it will not effect germination for it will be exposed out.

Soil factor-when the soil is compact will affect germination .PH/Mineral contents; some need low ph. while others need high ph.

Moisture- some species germinate over a wide range of soil moisture content

AGRONOMY & CROP PRODUCTION

Temperature-most species are specific , high medium or low but some spices requires fluctuating temperatures

Oxygen- generally not a factor unless flooded conditions e.g. rice

L**ight**-necessary for many species , especially smaller seeded weeds[prevents germinations at depth where survival is minimal.

The strategies for weed success

There is rapid growth

There is discontinuous germination [ability to lie dormant]

Weed seeds germinate and survive over a wide range of environments and conditions

Short and long distance dispersal

It is self compatible but not self pollinating

Its has a tremendous seed production

It has a tremendous seed production

AGRONOMY & CROP PRODUCTION

Genetics：inherent

Variability; favorable characteristics for primary invaders into an open niches

General purpose genotypes, plasticity allow s for maximum adaptation [changes in growth response to change in conditions]

Most crops were once weeds because of favorable adaptation character tics have been bred out.

weeds disseminated

Natural means/process

Wind-seed poses specialized structure i.e. wings

Water-seeds have corky or air filled structure[float and exclude water]

Animals- thorny and hooked structures edible fruits

Forceful dehiscence; explode releasing seeds e.g. oxalis ssp.

AGRONOMY & CROP PRODUCTION

Weed seed germination

Dormancy/scarification proportion of weed seed bank is always dormant

Physical- hard , impermeable seed coat [morning glory]

Physiological : there is some with growth inhibitors[mustard seeds]

Morphological , when the embryo is immature.

AGRONOMY & CROP PRODUCTION

The steps of effective weed management

Monitor seed and vegetative population

Identify problem weed species

Predict weed population shifts

Decide weather control is needed or warranted

Choose control technology [wisely]

Evaluate long term impact of option [impact on the environment]

AGRONOMY & CROP PRODUCTION

Adverse effects of weeds

Detrimental effects;

Irritants-its poisons and irritates man and animals

Reduced quality of farm or commercial products

stains-, by green weeds in cotton

Foreign materials

Impaired quality of livestock

Toxicity

Causes abortion/refusal to nurse

Tainted wool

Taint milk, e.g. wild onions/garlic

Spiny thorns ,prickles irritates digestive tract/refusal to eat

AGRONOMY & CROP PRODUCTION

Interreference with water management and floods control e.g. hydrilla]

Harbor pest[secondary host]-insects e.g. . Thrips

Disease-

Nematodes[legume weeds]

Obstruct powerlines rails, roads , highways, signs etc.

Yield reduction [economic effects] e.g. caused quarter of crop losses

Economic importance of weeds

Disadvantages

Weeds increase cost of water management , they interfere with irrigation recreations, fishing e.g. hyacinth]

Weeds increase production cost , additional inputs to control disease , pest and labour

Weeds reduces human efficiency some cause allergies and poisoning and heavy infection require more time

Competition with crops for high /water nutrients reducing yields and quality of produce

Alternative hosts for crops pest and disease ,they harbor many fungal ,viral, and bacterial disease as well as insects pest. Provide food for birds , rodents and predators

AGRONOMY & CROP PRODUCTION

Advantages[uses of weeds]

Food for animals especially for zero grazing

Human food ,potherbs and vegetables during dry seasons e.g. Amaranthus spp

Source of drugs, alkaloids and other chemical effective medicines

Protect soil from erosion , nutrients leaching and volatilization , improve soil structure temporary with draw of nutrients.

AGRONOMY & CROP PRODUCTION

The types of weeds

Common names	**science/botanical names**
Black jack	BidensPilosa
Tick berry	lantana camara
Spider weed	gynandropsis gynanadra
Sodom apple	solanum incanum
Wandering Jew	benghaleusis[big]/Africana[small], commelina spp
Thorn apple	datura stramonium
Spiny weed	Amaranthus bybridus
Cough grass	digiteria scalarum
Wild finger millet	fleisine spp
Star grass	cynodon dactylon
Nut grass	cyperus rotundus

AGRONOMY & CROP PRODUCTION

Tick berry[lantana camara]

Spider flower[Gynandropsis gynandra]

AGRONOMY & CROP PRODUCTION

Sodom apple[solanum incanum]

wandering Jew

AGRONOMY & CROP PRODUCTION

Nut grass[cyperus rotundus]

Thorn apple[Datura Stramonium]