- Wheat seed rates are lower. Plant stands are better.
- Better tillering, increased panicle/ear length and bolder grain.
- Farmers can apply N and irrigation water at grain filling stage in wheat to improve protein content without lodging. Reduced lodging can have a significant, positive effect on yield as many farmers do not irrigate after heading precisely to avoid lodging. As a result, water can become a limiting factor during grain filling, resulting in lower yields.
- Bed planting facilitates irrigation before sowing and thus provides an opportunity for weed control prior to planting. If pre-sowing irrigation is likely to delay planting, bed planted crops can be irrigated immediately after seeding
- Weeds between the beds can be controlled mechanically, early in the crop cycle.
- Herbicide dependence is reduced, and hand weeding and rouging between rows are easier. The major weed species affecting wheat, Phalaris minor, is less prolific on dry tops of raised beds than on the wetter soil found in conventional flat bed planting. Raised beds make it easier to apply herbicides because the beds allow the person spraying to follow the line. They also make possible mechanical weeding , and easier rouging or hand weeding.
- On raised beds, border effects allows the canopy to intercepts more solar radiation, it strengthens the straws, and the soil around the base of the plant is drier to prevent crop from lodging.
- In hand harvested rice fields, wheat crop can be planted in just one pass. The bed planter reshapes the beds and furrows, plants the crop and places fertilizer at appropriate depth into the soils along seed or between seed rows in the centre of the bed at 5-10cm depth. In combine harvested rice fields, crop straws can be incorporated into the beds using a shovel type furrow openers fixed on the front bar of the bed planter frame. In the absence of appropriate machinery, farmers partial layer interactions and less burn the rice straws before seeding of wheat..

Conventional Tillage

Conventional tillage incorporates or buries most of the crop residue into the soil. Typically this approach involves multiple passes in fields. The moldboard plow is often used first, followed by other implements

INTRODUCTION

Resource conservation techniques

FIRB (Furrow Irrigated Raised Bed)

Conventional Tillage

Zero Tillage

FIRB (FURROW IRRIGATED RAISED BED)

Furrow irrigated raised bed system wheat or other crops are planted on the raised beds in ridge - furrow system. this system is often considered more appropriate for growing high value crops that are more sensitive to temporary water logging stress. farmers often raise crops such as cotton, maize-soybean and wheat on the raised beds. however, the practice of growing rice, the major water-using crop in rice-wheat systems, on narrow raised beds was introduced only very recently in the indo-gangetic plains to reduce water use, conserve rainwater and improve system productivity.

Advantages-

- Management of irrigation water is improved is simpler, and more efficient. On an average it uses, 30% less water than flat bed methods and improves crop yields by more than 20%. FIRB planting saves 30% to 50% wheat seed compared to flat bed planting.
- Better upland crop production is possible in the wet monsoon because of better drainage. Fertilizer efficiency can be increased because of better placement including top dress applications.

क्रमांक: COOP/2023/KOTA/201080/25/25

एग्रीकल्चर फ़ोरम फॉर टेक्निकल एजुकेशन ऑफ़ फार्मिंग सोसायटी

कोटा, राजस्थान

ADVANTAGES of RESOURCE CONSERVATION TECHNOLOGIES

संकलन

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Advantages-

- Reduced soil erosion-When soil is tilled and loosened, and residue is buried or removed, the potential for erosion increases.
- Improved soil health-In the humid Southeast, conservation tillage systems have positive effects on chemical, physical and biological soil properties when compared to conventional tillage. Reduced mechanical disturbance results in less destruction of soil organisms and their habitat. Biological activity is more robust.
- Improved water conservation-Crop residue protects soil from raindrop impact, which in turn reduces soil crusting that results in surface sealing [42]. Soil crusting reduces water infiltration and air exchange that can impair crop germination.
- Improved air quality-In many regions, erosion by wind can be a serious problem both environmentally and agronomically. In the east, the Southern Coastal Plain soils are most vulnerable to wind erosion.
- Improved wildlife habitat-Management of agricultural land has vital implications for wildlife. Just as humans require nutritious food, clean water and adequate shelter (refuge from the environment and from predators), so does wildlife.Conservation tillage also provides food opportunities and shelter for small mammals and birds such as mice, rabbits, bobwhite or quail.
- Economic Benefits-When farms convert from conventional tillage systems to conservation tillage systems, there is potential to lower production costs and improve farm profitability.
- Lower production costs-Cost savings with conservation tillage systems over conventional systems primarily stem from reductions in the use of labor and machinery. This includes both short- and long-term cost savings in variable and fixed labor costs as well as fuel and machinery costs. The savings will likely differ from farm to farm due to differences in weather and farm characteristics, such as farm size, as well as management approaches
- Conventional systems destroys pests' shelters and disrupts their lifecycles which wil prove benificial for crop
- Conventional tillage systems exposes pests to predators and unfavourable conditions
- Conventional tillage systems distributes nutrients of the soil throughout the tillage l
- Aerates the soil
- Conventional tillage systems will help a lot to remove or controls weeds from the field.
- Conventional tillage systems Makes other farm cultural practices easier to undertake.

Zero Tillage

Zero tillage is also known as No-Tillage. It is a cultivation practice with little or no soil surface disturbance, the only disturbance being during planting. It is suitable for small, medium and large farmers, using hand planting methods, animal traction, or mechanized planting/sowing.

Advantages-

- Soil Conservation-One of the primary benefits of zero-tillage systems is soil conservation.
- These systems help to reduce soil erosion by minimizing soil disturbance, which prevents soil particles from being exposed to the wind and water.
- This approach also helps to retain soil moisture, which reduces the need for irrigation, and improves soil structure, which enhances soil fertility.
- lReduced Labour and Fuel Costs-Another advantage of zero-tillage systems is the reduced labor and fuel costs associated with conventional tillage practices.
- These systems require less fuel and labor compared to conventional tillage practices, which can save farmers money and reduce their carbon footprint.
- Increased Crop Yields-Studies have shown that zero-tillage systems can increase crop yields.
- This is because these systems improve soil fertility by increasing soil organic matter, which enhances soil nutrient availability.
- Additionally zero tillage systems can increase water retention in the soil, which can improve crop growth and yield.
- Environmental Sustainability-Zero-tillage systems are environmentally sustainable farming practices.
- By reducing soil erosion, conserving soil moisture, and improving soil health, these systems help to promote environmental sustainability.
- They also reduce greenhouse gas emissions by reducing fuel usage and sequester carbon in the soil through the accumulation of crop residues.

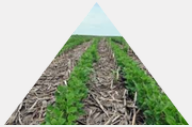
CONCLUSION

The conservation of natural resources becomes necessity to achieve sustainable and profitable pulse production system and subsequently to improve livelihoods of the farmers. The key challenge today is to adopt strategies that will address the twin concerns of maintaining and enhancing the integrity of natural resources and improved productivity. The improvement of natural resources forms the very basis for long term sustained productivity.The RCTs have not only the water and fuel saving benefits, these have other important benefits like reduced effect of greenhouse gases, decreased soil erosion and abasement of the natural resource base, it provides a higher push to yields and economy of farm, and positive impact labor efficiency

FIRB

Conventional Tillage

RESOURCE CONSERVATION TECHNOLOGY



Zero Tillage

Reduced Tillage