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कृषि विज्ञान की मासिक पत्रिका

किसान गज़ट

Green Fields,
Growing Strong
Caring for the Mid-Kharif Crop

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Paddy Transplanting: Techniques for a Uniform and Productive Rice Crop

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Abstract

Transplanting is a critical operation in rice cultivation that establishes the crop in the main field. The care taken during transplanting influences plant population, uniformity, and ultimately yield. This article discusses the principles of good transplanting, including seedling age, spacing, and depth, and the practices that support successful establishment. Attention to transplanting technique lays the foundation for a healthy and productive paddy crop.

Transplanting is the moment at which the rice crop takes its place in the main field, and the manner in which it is done shapes the crop that follows. Seedlings raised with care in the nursery must be moved into the puddled field and established in a way that gives them room to grow, a good root hold, and a uniform stand. Done well, transplanting sets the crop on course for a productive season; done carelessly, it handicaps the crop from the start.

Though transplanting is a familiar operation, the details of how it is carried out matter greatly. The age of the seedlings, the spacing between them, the depth at which they are set, and the condition of the field all influence how well the crop establishes and how it yields.

The Age of the Seedlings

The age at which seedlings are transplanted affects how well they establish and grow. Seedlings that are too young are delicate and may struggle to survive the move, while those that are too old have passed their prime and establish poorly, recovering slowly from the shock of transplanting and yielding less. Transplanting seedlings at the appropriate age gives the best results.

Young, healthy seedlings of the right age recover quickly from transplanting and resume growth without a long check. They develop strong roots and tillers and go on to form a vigorous crop. Matching the timing of transplanting to the age of the seedlings, and to the readiness of the field, is an important element of good practice.

Spacing and Plant Population

The spacing at which seedlings are transplanted determines the number of plants in the field and

the room each has to grow. Spacing that is too close crowds the plants, causing them to compete for light, nutrients, and space, while spacing that is too wide leaves the field under-populated and wastes its capacity. Appropriate spacing balances these considerations, giving a plant population that makes full use of the field.

Regular spacing, with seedlings set out in an even pattern, allows each plant room to develop and makes subsequent operations easier. A uniform, well-spaced stand tillers well, intercepts light efficiently, and forms the basis of a high-yielding crop. Attention to spacing during transplanting is repaid throughout the season.

Depth and Placement

The depth at which seedlings are transplanted influences their establishment and tillering. Seedlings set too deep are slow to establish and produce fewer tillers, while those set too shallow may be dislodged. Transplanting seedlings at a shallow, appropriate depth, so that they are firmly held yet free to tiller, promotes vigorous growth and good tiller production.

Placing a suitable number of seedlings together at each spot, neither too many nor too few, ensures a healthy stand without excessive competition within each hill. Careful placement, with seedlings set upright and firmly in the puddled soil, helps them establish quickly and grow into productive plants.

Field Condition and Care After Transplanting

The condition of the field at transplanting affects how well the seedlings establish. A well-puddled, levelled field allows even transplanting, good water control, and uniform growth. Levelling is





particularly important, as it enables water to be managed evenly across the field, avoiding areas that are too deep or too dry for the young crop.

In the days after transplanting, the crop needs care as it recovers and establishes. Maintaining an appropriate level of water, neither too deep nor too shallow, supports the establishing seedlings, and gaps where seedlings have failed can be filled to maintain a full stand. Attentive care during this establishment phase secures the uniform, healthy crop that good transplanting begins.

Conclusion

Transplanting is a decisive operation in rice cultivation, and the care taken during it shapes the crop for the rest of the season. By transplanting seedlings of the right age, at appropriate spacing and depth, into a well-prepared field, and by caring for the crop as it establishes, farmers lay the foundation for a uniform, vigorous, and productive paddy crop. Attention to the technique of transplanting is among the surest investments a rice farmer can make.

कृषि विज्ञान की मासिक पत्रिका

किसान गज़ट



Nutrient Management in Standing Kharif Crops: Feeding the Crop at the Right Time

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Abstract

Supplying nutrients in the right amounts and at the right times is essential for realising the yield potential of standing kharif crops. This article discusses the principles of nutrient management during the growing season, including the timing of fertiliser application, the signs of nutrient deficiency, and practices that improve nutrient-use efficiency. Feeding the crop according to its needs supports healthy growth, good yields, and efficient use of fertilisers.

As the kharif crop grows through the monsoon, its need for nutrients changes with each stage of development. Meeting these changing needs, supplying the right nutrients in the right amounts at the right times, is central to achieving a good yield. Nutrient management does not end with a single application at sowing; it continues through the season, guided by the crop's requirements and its condition.

Feeding a crop well is a matter of both quantity and timing. Applying the correct amount of nutrients, in a manner and at a time that allows the crop to use them efficiently, supports healthy growth while avoiding the waste and harm of excess. Understanding how to manage nutrients in the standing crop helps farmers realise its potential.

Matching Nutrients to Crop Growth

A crop's demand for nutrients varies as it grows. In the early stages, it needs nutrients to establish and build its framework of roots, stems, and leaves. As it moves into its reproductive phase, its needs shift toward the formation of grain or produce. Supplying nutrients in step with these changing demands ensures that they are available when the crop can make best use of them.

This principle underlies the practice of applying nutrients in portions through the season rather than all at once. By providing nutrients as the crop needs them, farmers ensure a steady supply, support each stage of growth, and reduce the losses that occur when nutrients are applied far ahead of the crop's ability to take them up.

Timing Fertiliser Applications

The timing of fertiliser application strongly affects how efficiently the crop uses it. Nutrients that are readily lost, such as nitrogen, benefit from being applied in split doses timed to the crop's periods of active growth, so that the crop absorbs them before they can be lost. Applying such nutrients at the appropriate growth stages improves their uptake and reduces waste.

Other nutrients may be supplied mainly at the outset, before or at sowing, to be available as the crop develops. Planning the timing of each application according to the nutrient and the crop's needs ensures that the crop is well fed throughout its growth and that fertilisers are used to good effect.

Recognising Nutrient Deficiencies

A crop short of a particular nutrient often shows characteristic signs, such as changes in the colour or appearance of its leaves or a slowing of its growth. Learning to recognise these signs allows farmers to detect deficiencies and respond before they seriously affect yield. Different nutrients produce different symptoms, and correct identification guides the appropriate response.

Observing the crop regularly, and being alert to signs of deficiency, complements planned nutrient management by allowing timely correction of shortfalls. Where a deficiency is detected, a suitable application, sometimes as a foliar spray for rapid effect, can restore the crop's health and protect its yield.

Improving Nutrient-Use Efficiency

Using nutrients efficiently means ensuring that as much as possible of what is applied is taken up by the crop rather than lost. Applying nutrients at the





right time, in the right place, and in the right form all contribute to efficiency, as do practices that reduce losses to the air, water, or soil. Efficient use lowers costs and reduces the environmental impact of fertilisers.

Combining chemical fertilisers with organic sources of nutrients, and with biofertilisers, supports both efficiency and soil health. Balanced nutrition, supplying all the nutrients the crop needs in proportion, ensures that no single nutrient limits the crop's response to the others, making the whole more effective.

Conclusion

Nutrient management in the standing crop is a continuing task that runs through the kharif season. By matching the supply of nutrients to the crop's changing needs, timing applications well, recognising and correcting deficiencies, and using nutrients efficiently, farmers can support healthy growth and realise the yield potential of their crops. Feeding the crop at the right time, in the right amounts, is a cornerstone of productive and economical cultivation.

कृषि विज्ञान की मासिक पत्रिका

किसान गज़ट



Water Management in Rice Fields: Beyond Continuous Flooding

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Abstract

Rice is traditionally grown under continuous flooding, but this practice uses large amounts of water. Improved water management practices can maintain or even increase yields while using water more efficiently. This article discusses water management in rice fields, including the water needs at different growth stages and practices such as intermittent irrigation that save water. Managing water wisely conserves a precious resource while supporting a productive rice crop.

Rice is a crop of water, grown across much of India in flooded fields that have shaped the landscape and culture of rice-growing regions. Yet the traditional practice of keeping fields continuously flooded consumes enormous quantities of water, a resource that is growing scarcer and more precious. Managing water in rice fields more wisely, using it efficiently while still meeting the crop's needs, is increasingly important for the sustainability of rice cultivation.

Rice does not, in fact, require continuous flooding throughout its life, and improved water management can maintain good yields while saving water. Understanding the crop's water needs and the practices that meet them efficiently allows farmers to grow rice with less water.

Rice and Its Water Needs

Although rice is adapted to grow in flooded conditions and tolerates standing water, it does not need to be flooded continuously to yield well. The crop has periods when adequate water is critical and other periods when the field can be allowed to dry somewhat without harm. Recognising these differences is the key to managing water efficiently.

The standing water in a rice field serves purposes beyond supplying the crop, such as suppressing weeds and moderating temperature. Efficient water management seeks to retain these benefits while reducing the amount of water used, by supplying water when the crop most needs it and economising when it can be spared.

Water at Different Growth Stages

The rice crop's sensitivity to water varies through its life. Certain stages, such as around flowering,

are particularly sensitive, and water stress at these times can seriously reduce yield. At these critical stages, adequate water must be assured. At other stages, the crop can tolerate a lower water level or a period of drying without significant harm.

Knowing which stages are critical and which are more tolerant allows farmers to prioritise water where it matters most and to save it where the crop can manage with less. This staged approach to water management protects yield while reducing overall water use, an important advantage where water is limited.

Water-Saving Practices

A number of practices allow rice to be grown with less water than continuous flooding requires. Intermittent irrigation, in which the field is allowed to dry to a certain point before being irrigated again rather than being kept constantly flooded, can substantially reduce water use while maintaining yield. Such practices apply water in response to the crop's needs rather than maintaining a permanent flood.

Good land levelling and the maintenance of field bunds support efficient water management by allowing water to be held and distributed evenly and by preventing losses. Ensuring that water is retained in the field and used by the crop, rather than lost through seepage or overflow, improves the efficiency with which every unit of water is used.

Benefits of Efficient Water Management

Managing water efficiently in rice fields conserves a scarce and valuable resource, allowing the available water to irrigate a larger area or to be reserved for other uses. It also





reduces the energy needed to pump water, lowering costs, and can reduce certain problems associated with prolonged flooding.

Efficient water management thus benefits the farmer through savings in water and energy, and benefits the wider community and environment through the conservation of water. As pressure on water resources grows, the wise management of water in rice cultivation becomes ever more valuable, aligning the interests of the individual farmer with those of society.

Conclusion

Rice need not be grown under continuous flooding to yield well, and managing water more wisely offers substantial benefits. By understanding the crop's water needs at different stages, assuring water at critical times, and adopting water-saving practices, farmers can grow productive rice crops while conserving water and energy. In a future of increasing water scarcity, efficient water management in rice fields is essential for sustainable and resilient cultivation.

कृषि विज्ञान की मासिक पत्रिका

किसान गज़ट



Integrated Pest Management in Kharif Crops During Peak Monsoon

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Abstract

The peak of the monsoon brings conditions highly favourable to insect pests in kharif crops. Integrated pest management combines multiple methods to keep pests below damaging levels while minimising reliance on chemical pesticides. This article discusses the principles of integrated pest management and its application in kharif crops during the height of the monsoon. A balanced, integrated approach protects the crop effectively while safeguarding beneficial organisms and the environment.

At the height of the monsoon, when warmth and humidity combine, insect pests find ideal conditions to multiply and attack kharif crops. Faced with this pressure, farmers need a strategy that protects their crops effectively without the drawbacks of relying too heavily on chemical pesticides. Integrated pest management provides such a strategy, combining several complementary methods to keep pests below damaging levels while conserving beneficial organisms and protecting the environment.

Integrated pest management is not a single technique but an approach, a way of thinking about pest control that draws on many methods and applies them wisely. Understanding its principles allows farmers to manage pests during the demanding peak monsoon period in a manner that is effective, economical, and sustainable.

The Philosophy of Integrated Pest Management

Integrated pest management rests on the understanding that pests need not be eliminated entirely, but only kept below the level at which they cause economic damage. It seeks to manage pest populations using the full range of available methods, reserving chemical pesticides for situations where they are truly needed rather than using them routinely. This approach reduces costs, protects beneficial organisms, and slows the development of pest resistance.

Central to this philosophy is the idea of acting on the basis of what is actually happening in the crop, through monitoring, rather than on a fixed schedule. By observing the crop and the pests present, and intervening only when justified,

integrated pest management avoids unnecessary treatments and their costs and harms.

Cultural and Preventive Methods

Many pest problems can be prevented or reduced through cultural practices that make the crop and its environment less favourable to pests. Practices such as appropriate sowing time, good crop nutrition, suitable spacing, field sanitation, and crop rotation all influence pest pressure, often reducing it before pests become a problem. These preventive measures form the foundation of integrated pest management.

A healthy, vigorous crop withstands pest attack better than a weak one, so the practices that promote good crop health also contribute to pest management. Building these preventive measures into the cultivation of the crop reduces the reliance on curative measures later in the season.

Biological Control and Natural Enemies

The natural world contains many organisms that prey upon or parasitise crop pests, keeping their populations in check. These natural enemies are valuable allies, and integrated pest management seeks to conserve and encourage them. Avoiding the indiscriminate use of pesticides, which harm these beneficial organisms along with the pests, allows natural control to operate.

By protecting the natural enemies present in and around the crop, farmers harness a form of pest control that works continuously and at no cost. Where appropriate, beneficial organisms may also be encouraged or introduced. This biological dimension of pest management is a powerful and sustainable component of the integrated approach.





Judicious Use of Other Measures

When monitoring shows that pests have reached levels that threaten economic damage, and other measures are insufficient, intervention becomes necessary. Even then, integrated pest management favours measures that are effective yet least harmful to beneficial organisms and the environment, and applies them in a targeted way, at the right time and place, and only to the extent needed.

Using such measures judiciously, as one component of an integrated strategy rather than the first and only resort, preserves their effectiveness and limits their unwanted effects. This restrained, targeted use stands in contrast to routine, calendar-based application and reflects

the considered approach at the heart of integrated pest management.

Conclusion

During the peak of the monsoon, when conditions favour pests, integrated pest management offers kharif farmers an effective and sustainable means of protecting their crops. By combining preventive cultural practices, the conservation of natural enemies, monitoring, and the judicious use of other measures, this approach keeps pests below damaging levels while safeguarding beneficial organisms and the environment. A balanced, integrated strategy protects both the crop and the long-term health of the farming system.

कृषि विज्ञान की मासिक पत्रिका

किसान गज़ट



Managing Nutrient Deficiencies in Kharif Crops Under Heavy Rainfall

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Abstract

Heavy monsoon rainfall can leach nutrients from the soil and impair the crop's ability to take them up, leading to deficiencies that reduce growth and yield. This article discusses how heavy rainfall contributes to nutrient deficiencies in kharif crops, how to recognise these deficiencies, and how to correct them. Timely attention to nutrient problems that arise under wet conditions helps protect the crop and maintain its productivity.

The heavy rainfall of the monsoon, while essential to kharif crops, can create conditions in which those crops suffer nutrient deficiencies. Abundant water moving through the soil can carry away nutrients, and waterlogged conditions can impair roots and hinder nutrient uptake. As a result, crops that appeared healthy may begin to show signs of deficiency during periods of heavy rain, with consequences for growth and yield if not addressed.

Understanding how heavy rainfall leads to nutrient deficiencies, recognising the signs when they appear, and knowing how to respond enable farmers to protect their crops during the wettest part of the season. Timely attention can prevent a temporary problem from becoming a lasting loss.

How Heavy Rainfall Causes Deficiencies

Heavy rainfall affects the supply of nutrients to crops in several ways. Water moving downward through the soil can carry soluble nutrients, particularly nitrogen, below the root zone, a process that removes nutrients the crop needs. In this way, nutrients applied to the crop may be lost before they can be taken up, leaving the crop short.

Waterlogging, which often accompanies heavy rain, compounds the problem. When the soil is saturated and roots are deprived of oxygen, their ability to take up nutrients is impaired, so that even where nutrients are present, the crop cannot absorb them well. The combination of nutrient loss and reduced uptake can produce clear deficiencies during wet spells.

Recognising the Signs

Nutrient deficiencies reveal themselves in the appearance of the crop, most often in the leaves. A shortage of nitrogen, for example, typically causes a general yellowing and slowing of growth, while other deficiencies produce their own characteristic patterns of discolouration or abnormal growth. Learning to read these signs allows farmers to identify which nutrient the crop lacks.

Because deficiencies that arise from heavy rainfall may appear suddenly during or after wet periods, observing the crop closely at such times is important. Distinguishing nutrient deficiency from other causes of poor appearance, such as disease or waterlogging damage, guides the correct response, and where identification is uncertain, advice from extension services can help.

Correcting Deficiencies

When a nutrient deficiency is identified, it can often be corrected by supplying the lacking nutrient. Where the soil has been drained of a nutrient by leaching, a supplementary application can restore the supply, timed and applied so that the crop can take it up before further loss. Foliar sprays, which deliver nutrients directly to the leaves, offer a rapid means of correcting certain deficiencies, useful when quick action is needed.

In correcting deficiencies caused by wet conditions, it is important also to address the underlying situation where possible, for instance by improving drainage to relieve waterlogging so that roots can function and take up nutrients again. Combining the supply of the missing nutrient with the improvement of conditions gives the crop the best chance of recovery.





Preventing Losses

Beyond correcting deficiencies once they appear, farmers can take steps to reduce the loss of nutrients under heavy rainfall. Applying readily lost nutrients such as nitrogen in split doses, timed to the crop's needs, reduces the amount vulnerable to leaching at any one time. Good drainage limits waterlogging and its effect on nutrient uptake, and practices that build soil organic matter improve the soil's capacity to hold nutrients against loss.

These preventive measures lessen the risk of deficiencies arising in the first place, complementing the correction of deficiencies that do occur. Managing nutrients with an awareness of the losses that heavy rain can cause helps

maintain the crop's nutrient supply through the wettest part of the season.

Conclusion

Heavy monsoon rainfall can rob kharif crops of nutrients through leaching and impaired uptake, leading to deficiencies that threaten growth and yield. By understanding how these deficiencies arise, recognising their signs, correcting them promptly, and taking steps to prevent nutrient losses, farmers can protect their crops through the wettest part of the season. Attentive nutrient management under wet conditions helps ensure that the crop remains healthy and productive despite the challenges of heavy rain.

कृषि विज्ञान की मासिक पत्रिका

किसान गज़ट



Managing Kharif Crops During Dry Spells Within the Monsoon

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Abstract

The monsoon does not always bring steady rain; breaks or dry spells can occur even in the midst of the rainy season, stressing kharif crops that depend on the rains. This article discusses the impact of dry spells within the monsoon and the measures farmers can take to protect their crops, including supplementary irrigation, moisture conservation, and crop management. Preparing for and responding to dry spells helps safeguard the kharif crop against the unpredictability of the monsoon.

The monsoon is often imagined as a season of continuous rain, but in reality its rains come in spells, and breaks between them are common. A dry spell in the midst of the monsoon, when rain that the crop depends on fails to arrive for days or weeks, can stress kharif crops severely, particularly if it coincides with a sensitive stage of growth. For farmers who rely on the rains, these dry spells are among the greatest uncertainties of the season.

Because dry spells can strike at any time and their timing cannot be foreseen with certainty, preparing for them and knowing how to respond are essential. With foresight and appropriate measures, farmers can reduce the harm that a break in the monsoon causes to their crops.

The Impact of Dry Spells

A dry spell interrupts the supply of water on which a rain-fed crop depends. As the soil dries, the crop experiences moisture stress, and if the spell is prolonged or occurs at a sensitive stage, growth is checked and yield may be reduced. The most damaging dry spells are those that coincide with critical stages such as flowering, when the crop's need for water is greatest and stress most harmful.

The severity of the impact depends on the length of the dry spell, its timing in relation to the crop's growth, and the capacity of the soil to hold moisture. A short break may cause little harm, while a long one at a critical time can seriously damage the crop. Understanding this helps farmers judge how urgently to respond to a developing dry spell.

Supplementary Irrigation

Where a source of water is available, supplementary irrigation during a dry spell can save the crop from stress. Even a single irrigation given at a critical time, when the crop most needs water, can prevent the yield loss that a dry spell would otherwise cause. This is one of the most important uses of water stored in farm ponds and other harvesting structures, which are filled during periods of rain precisely for such occasions.

The ability to provide supplementary irrigation transforms a farmer's capacity to cope with dry spells, turning a potential disaster into a manageable setback. Prioritising the limited water available for the most critical stages of the crop makes the best use of it when a dry spell strikes.

Conserving Soil Moisture

Conserving the moisture already in the soil helps crops endure dry spells by extending the time before stress sets in. Practices such as mulching the soil surface reduce evaporation and keep moisture in the root zone longer, while measures that improve the soil's capacity to hold water build a reserve on which the crop can draw during a break in the rains.

Loosening the soil surface to reduce evaporation, and controlling weeds that would otherwise compete for the scarce moisture, further conserve water for the crop. These practices, applied before and during dry spells, stretch the available moisture and help the crop survive until the rains return.

Crop Management for Resilience

Choices made in planning and managing the crop influence its resilience to dry spells. Growing crops and varieties suited to the rainfall of the





area, including those that tolerate or escape drought, reduces the risk of loss. A crop that is well established, healthy, and appropriately nourished withstands moisture stress better than a weak one.

During a dry spell, avoiding operations that would add to the crop's stress, and taking measures to reduce the demand for water, help the crop endure. Being prepared to act, whether by irrigating, conserving moisture, or otherwise supporting the crop, allows farmers to respond effectively when a break in the monsoon occurs.

Conclusion

Dry spells within the monsoon are a recurring hazard for kharif crops, capable of causing serious damage when they strike at critical times. By preparing for them through water storage and moisture conservation, responding with supplementary irrigation where possible, and managing crops for resilience, farmers can protect their crops against the unpredictability of the monsoon. Foresight and timely action turn the threat of a dry spell into a challenge that can be met.

कृषि विज्ञान की मासिक पत्रिका

किसान गज़ट



Weed Control in Transplanted and Direct Seeded Rice

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Abstract

Weeds are a major constraint in rice cultivation, competing with the crop and reducing yields if not controlled. The approach to weed control differs between transplanted and direct seeded rice. This article discusses the weed problem in rice and the methods of controlling weeds in both systems, emphasising the importance of timely action during the critical early period. Effective weed management protects the rice crop and secures its yield.

Weeds are among the most serious constraints on rice production, competing with the crop for water, nutrients, light, and space, and reducing yields substantially where they are not controlled. The rice crop is especially vulnerable to weed competition in its early stages, and the management of weeds is a central task of rice cultivation. The approach required, however, differs between the two main systems of growing rice: transplanting and direct seeding.

Understanding the weed problem in rice, and the methods suited to each system, enables farmers to protect their crop from the losses that weeds cause. In both systems, timely action during the critical early period is the key to success.

The Weed Problem in Rice

Rice fields, warm and moist, provide conditions in which weeds thrive. If allowed to grow unchecked, weeds compete vigorously with the rice crop, capturing resources it needs and reducing its growth and yield. The competition is most damaging in the early part of the crop's life, when the young rice plants are establishing and are most susceptible to being overwhelmed by faster-growing weeds.

Because the early period is critical, keeping the crop free of weeds during this time is especially important. Weeds that establish alongside the young crop and compete with it during this window cause the greatest yield loss, so effective early weed control is the priority in rice weed management.

Weed Control in Transplanted Rice

In transplanted rice, the crop begins as established seedlings set into a puddled, flooded field, and the standing water helps suppress weeds. This gives

transplanted rice an advantage in weed management, as the flood inhibits the germination and growth of many weeds, and the head start of the transplanted seedlings over emerging weeds further favours the crop.

Nonetheless, weeds do grow in transplanted rice and require control. Maintaining an appropriate depth of water suppresses weeds, and physical removal of weeds, particularly during the critical early period, keeps the crop clean. Combining good water management with timely weeding manages weeds effectively in the transplanted system.

Weed Control in Direct Seeded Rice

In direct seeded rice, the crop and the weeds emerge together, and there is no standing water at the outset to suppress the weeds. This makes weed control more challenging than in transplanted rice, as the crop lacks the head start and the weed-suppressing flood of the transplanted system. Weeds can compete with the direct seeded crop from the very beginning, and controlling them is essential for a successful crop.

Effective weed control in direct seeded rice relies on good land preparation to reduce the initial weed population, timely control measures during the early period, and careful water management as the crop establishes. Vigilant, prompt attention to weeds is particularly important in this system, where their impact can be severe if they are allowed to gain a foothold.

The Importance of Timely Action

In both systems, the timing of weed control is decisive. Controlling weeds during the critical early period, before they compete strongly with the crop, prevents the yield loss that late control cannot recover. Delayed weeding, after the weeds





have already competed with the crop, is far less effective, as the damage will have been done.

Planning weed control to address the weed problem during this critical window, and acting promptly when weeds appear, is therefore the foundation of effective weed management in rice. Combining timely action with the methods suited to the system in use protects the crop and secures its yield.

Conclusion

Weeds pose a serious threat to rice yields, but the threat can be managed through methods suited to the system of cultivation and, above all, through timely action during the crop's critical early period. Transplanted rice benefits from the weed-suppressing flood and the head start of its seedlings, while direct seeded rice demands especially vigilant early control. In both systems, effective weed management protects the rice crop and safeguards the yield on which the farmer depends.

कृषि विज्ञान की मासिक पत्रिका

किसान गज़ट



Kharif Vegetable Cultivation: Managing Crops Through the Rainy Season

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Abstract

Growing vegetables during the rainy season presents both opportunities and challenges. The monsoon supplies water, but excess moisture, high humidity, and pest and disease pressure complicate cultivation. This article discusses the management of kharif vegetables, including drainage, staking, and protection from pests and diseases. With appropriate care, farmers can produce vegetables during the monsoon and benefit from good prices when supply is otherwise limited.

Vegetables grown during the rainy season can be a rewarding enterprise, supplying the market at a time when the supply from other sources may be limited and prices favourable. Yet cultivating vegetables through the monsoon is demanding. The same rains that supply water bring the risks of excess moisture, high humidity, and heightened pest and disease pressure, all of which can damage tender vegetable crops. Success requires careful management suited to these conditions.

By anticipating the challenges of the rainy season and managing the crop accordingly, farmers can produce good vegetables during the monsoon and reap the reward of favourable prices. Attention to drainage, support, and protection is central to this success.

The Challenge of Excess Moisture

While vegetables need water, most are harmed by excess moisture around their roots. Waterlogging deprives roots of oxygen, damages the crop, and encourages root and other diseases. Ensuring good drainage is therefore among the most important requirements of rainy-season vegetable cultivation, so that excess water is removed and the crop is not left standing in water after heavy rain.

Growing vegetables on raised beds or ridges lifts the crop above the level at which water collects, keeping the root zone drained even when rain is heavy. This practice, combined with drainage channels to carry water away, protects vegetables from the waterlogging that the monsoon can bring and is a foundation of successful rainy-season cultivation.

Support and Protection of the Crop

Many vegetable crops benefit from support, particularly during the monsoon when heavy rain and wind can damage or flatten unsupported plants and when contact with wet soil promotes disease. Staking or otherwise supporting such crops keeps them upright, improves air circulation around them, and lifts fruits and foliage away from the wet ground, reducing disease and improving quality.

कृषि विज्ञान की मासिक पत्रिका

Protecting the crop from the physical effects of heavy rain, and maintaining conditions that discourage disease, are important aspects of care. Good air movement around the plants, achieved through appropriate spacing and support, helps the crop dry between showers and lessens the humid conditions in which diseases flourish.

Managing Pests and Diseases

The warm, humid conditions of the monsoon strongly favour the pests and diseases that afflict vegetables, making their management a major concern of rainy-season cultivation. High humidity and moisture create ideal conditions for many diseases, and pest populations can build up rapidly. Vigilant monitoring to detect problems early, and timely action to manage them, are essential to protect the crop.

An integrated approach, combining cultural practices that reduce pest and disease pressure with timely, targeted intervention when needed, gives the best results. Good drainage, appropriate spacing, support of the crop, and field sanitation all reduce disease, while regular observation allows pests and diseases to be caught and managed before they cause serious damage.





Realising the Opportunity

The reward for managing these challenges is the opportunity to supply vegetables during the monsoon at prices that reflect the limited supply. Vegetables that are scarce during the rainy season command good prices, so a successful crop can be highly profitable. Producing quality vegetables when others struggle to do so is the aim that justifies the careful management the season demands.

Choosing suitable crops and varieties for the rainy season, siting and preparing the field well, and managing the crop attentively throughout its growth together make rainy-season vegetable cultivation a viable and profitable enterprise. For

farmers with the skill and diligence it requires, the monsoon offers a valuable window of opportunity.

Conclusion

Kharif vegetable cultivation combines the challenges of the monsoon with the opportunity of a favourable market. By ensuring good drainage, supporting and protecting the crop, and managing pests and diseases through an integrated approach, farmers can overcome the difficulties of the rainy season and produce quality vegetables when they are most valuable. With careful management, the demanding conditions of the monsoon can be turned to profitable advantage.

कृषि विज्ञान की मासिक पत्रिका

किसान गज़ट



The Role of Organic Matter in Sustaining Kharif Soil Productivity

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Abstract

Soil organic matter is fundamental to soil fertility, structure, and the capacity to support productive crops. This article discusses the importance of organic matter for kharif soils, the ways in which it benefits the soil and crop, and the practices that build and maintain it. Enriching soils with organic matter supports higher yields, greater resilience, and the long-term sustainability of farming.

Beneath every productive crop lies a healthy soil, and at the heart of soil health lies organic matter. Though it makes up only a small fraction of most soils, organic matter exerts an influence on soil fertility and productivity out of all proportion to its quantity. For the soils that support kharif crops, maintaining and building organic matter is among the most important things a farmer can do to sustain productivity over the long term.

Organic matter is the living and once-living material in the soil, the residues of plants and animals and the multitude of organisms that transform them. Understanding what it does for the soil and crop, and how it can be built and maintained, allows farmers to manage this vital resource wisely.

What Organic Matter Does for the Soil

Organic matter benefits the soil in many ways at once. It improves soil structure, binding particles into a crumbly, well-aerated arrangement that roots can penetrate and through which water and air move freely. It increases the soil's capacity to hold water, helping crops withstand dry spells, and its capacity to hold nutrients, reducing their loss and keeping them available to the crop.

Organic matter is also a store of nutrients, which are released gradually as it decomposes, providing a steady supply to the crop. And it sustains the vast community of soil organisms whose activity is essential to fertility. Through all these effects, organic matter makes the soil more fertile, more resilient, and better able to support productive crops.

Organic Matter and the Kharif Crop

For the kharif crop, growing through the moisture and warmth of the monsoon, the benefits of organic matter are especially valuable. The improved structure that organic matter confers helps the soil absorb heavy rain and drain excess water, reducing waterlogging, while its capacity to hold moisture supports the crop through dry spells between the rains.

The steady release of nutrients from organic matter complements the supply from fertilisers, supporting the crop's growth. And the resilience that organic matter gives the soil, its ability to cope with the stresses of the season, helps the crop through the varied conditions of the monsoon. A soil rich in organic matter is better equipped to support a healthy kharif crop.

Building and Maintaining Organic Matter

Organic matter is built by adding organic materials to the soil and maintained by replacing what is lost through decomposition and cropping. Applying well-decomposed organic manures, incorporating crop residues, growing and ploughing in green manures, and returning organic materials to the soil all add to its organic matter. These practices, carried out regularly, build and sustain the organic matter on which fertility depends.

Because intensive cropping depletes organic matter, replenishing it is a continuing task rather than a one-time effort. Combining several sources of organic material, and integrating their addition into the cropping system, maintains organic matter over time. Practices that reduce its loss, such as avoiding the burning of residues and minimising unnecessary soil disturbance, also help conserve it.





Toward Sustainable Productivity

Managing organic matter well is central to sustainable farming. Soils rich in organic matter are more productive, more resilient, and less dependent on external inputs, and they sustain their fertility over the long term. Building organic matter thus serves both the immediate goal of good yields and the enduring goal of preserving the soil for the future.

In an era of concern over soil degradation and the sustainability of farming, the maintenance of soil organic matter is more important than ever. By enriching their soils with organic matter, farmers invest in the productivity and resilience of their

land, laying the foundation for sustainable and rewarding agriculture.

Conclusion

Soil organic matter, though small in quantity, is fundamental to the fertility, structure, and productivity of the soil, and its benefits are especially valuable to the kharif crop growing through the monsoon. By building and maintaining organic matter through the addition of organic materials and the conservation of what the soil contains, farmers sustain the productivity and resilience of their land. Caring for soil organic matter is caring for the very foundation of productive and sustainable farming.

कृषि विज्ञान की मासिक पत्रिका

किसान गज़ट



Crop Insurance and Risk Management for the Kharif Farmer

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Abstract

Kharif farming is exposed to many risks, from the uncertainty of the monsoon to pests, diseases, and market fluctuations. Crop insurance and other risk management measures help farmers cope with losses when adverse events occur. This article discusses the risks facing kharif farmers, the role of crop insurance, and broader strategies for managing risk. Protecting against risk safeguards farmers' livelihoods and supports their capacity to invest in productive farming.

Farming, and kharif farming in particular, is an enterprise carried out in the face of many uncertainties. The monsoon on which the season depends may bring too little rain or too much; pests and diseases may strike; prices may fall when the crop is ready to sell. These risks, largely beyond the farmer's control, can turn a promising season into a loss, threatening the livelihood of the farming household. Managing these risks is an essential part of farming wisely.

While good agronomy reduces some risks, others cannot be eliminated, and against these the farmer needs means of protection. Crop insurance, together with broader strategies for managing risk, helps farmers cope with losses when adverse events occur, cushioning the blow and supporting their capacity to continue and to invest in their farming.

The Risks Facing Kharif Farmers

The kharif farmer faces risks of several kinds. The greatest is the uncertainty of the weather, above all the monsoon, whose failure, excess, or ill timing can devastate crops. Pests and diseases pose a constant threat, capable of damaging or destroying a crop despite the farmer's efforts. And even a good harvest may bring disappointment if prices fall, so that the farmer's returns do not cover the costs of production.

These risks are largely outside the farmer's control, and their occurrence can cause serious financial hardship, particularly for small farmers with limited reserves. A single bad season can leave a household in debt and unable to invest in the next crop. Recognising these risks and preparing for them is therefore vital to the security of the farming household.

The Role of Crop Insurance

Crop insurance is a means by which farmers can protect themselves against losses from adverse events. In exchange for a premium, insurance provides compensation when a covered event, such as crop loss from adverse weather or other hazards, causes damage. This compensation helps the farmer recover from the loss, meet obligations, and continue farming, softening the impact of events that would otherwise be financially crippling.

Government-supported crop insurance schemes aim to make such protection accessible and affordable to farmers, including small and marginal ones. By spreading the risk of loss and providing a source of compensation when disaster strikes, crop insurance contributes to the financial security of farmers and their capacity to withstand the uncertainties of farming. Understanding the insurance available and how to obtain it enables farmers to make use of this protection.

Broader Strategies for Managing Risk

Crop insurance is one part of a broader approach to managing risk. Diversifying crops and activities so that the household does not depend entirely on a single crop reduces vulnerability, as the failure of one crop may be offset by others. Practices that build resilience, such as conserving soil and water, choosing suitable crops and varieties, and maintaining soil health, reduce the likelihood and severity of losses.

Prudent financial management, including maintaining reserves where possible and avoiding excessive debt, helps households withstand bad seasons. Access to credit on fair terms allows





farmers to recover and to invest, and collective approaches and support from institutions strengthen farmers' capacity to manage risk. Together, these strategies build the resilience that allows farming to continue in the face of uncertainty.

Risk Management and Investment

Protection against risk does more than cushion losses; it supports the farmer's willingness and ability to invest in productive farming. A farmer confident of some protection against catastrophic loss can invest in improved inputs and practices without the fear that a single bad season will bring ruin. In this way, managing risk encourages the investment on which higher productivity depends.

The security that risk management provides thus benefits not only the individual farmer but the

wider goal of a productive and resilient agriculture. By reducing the paralysing fear of loss, it frees farmers to farm ambitiously and to build for the future, contributing to the prosperity of the farming community as a whole.

Conclusion

Kharif farming is inseparable from risk, but that risk can be managed. Crop insurance offers protection against losses from adverse events, and broader strategies of diversification, resilience, and prudent management further strengthen the farming household against uncertainty. By protecting their livelihoods against the hazards of the season, farmers gain the security to continue and to invest in productive farming. In a calling as uncertain as agriculture, sound risk management is a foundation of both security and progress.

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