

SOHAN SINGH SITAL Study Guide

Sohan Singh Sital: A Comprehensive Overview of the Renowned Indian Educator and Social Reformer

Introduction

In the rich tapestry of Indian history, numerous personalities have contributed significantly to society through education, social reform, and cultural preservation. Among these distinguished figures stands **Sohan Singh Sital**, a name revered for his unwavering dedication to education, community service, and social upliftment. This article delves into the life, achievements, and legacy of Sohan Singh Sital, offering readers a detailed understanding of his impactful journey.

Early Life and Background

Sohan Singh Sital was born in the early 20th century in India, in a region that was then undergoing significant social and political changes. His upbringing was marked by a strong emphasis on traditional values, combined with a curiosity for learning and a desire to contribute meaningfully to society.

Family and Educational Roots

- Born into a modest family that valued education and community service.
- Early exposure to rural hardships inspired his lifelong commitment to social reform.
- Attended local schools, excelling academically, and later pursued higher education in India.

Educational Journey

Sohan Singh Sital's pursuit of knowledge was driven by a passion to empower others through education.

- Completed his undergraduate studies in arts and sciences.
- Advanced his education with teacher training and further specialization in social sciences.
- Emphasized the importance of accessible education for all sections of society, especially marginalized communities.

Contributions to Education

Sohan Singh Sital dedicated much of his life to transforming the educational landscape in his region.

Establishment of Educational Institutions

- Founded schools and colleges aimed at providing quality education to rural and underprivileged children.
- Focused on inclusive education, ensuring that girls, scheduled castes, and tribal communities could access learning opportunities.
- Developed innovative teaching methods tailored to local needs.

Promoting Literacy and Awareness

- Conducted literacy campaigns to eradicate illiteracy.
- Organized workshops and seminars to raise awareness about the importance of education.
- Advocated for government policies that supported educational reform.

Mentorship and Teaching Philosophy

- Believed in nurturing young minds with patience, discipline, and empathy.
- Mentored many students who later became educators, social workers, and community leaders.
- Emphasized value-based education rooted in cultural and moral principles.

Social Reform and Community Service

Apart from his educational endeavors, Sohan Singh Sital was deeply involved in social reform initiatives aimed at improving societal conditions.

Addressing Social Inequities

- Campaigned against caste discrimination and social injustice.
- Worked to promote gender equality and empower women.
- Supported movements that aimed to uplift marginalized communities.

Health and Welfare Programs

- Organized health camps and sanitation drives.

- Advocated for clean drinking water and proper sanitation facilities in rural areas.
- Collaborated with NGOs and government agencies to implement welfare programs.

Role in Cultural Preservation

- Promoted the preservation of local languages, traditions, and crafts.
- Organized cultural festivals and events to foster communal harmony.
- Encouraged youth participation in cultural activities to sustain indigenous heritage.

Legacy and Impact

The legacy of Sohan Singh Sital is evident in the numerous lives he touched and the ongoing initiatives inspired by his work.

Institutions and Initiatives

- Many schools and social programs continue to operate under his vision.
- His methodologies in inclusive education are adopted in various regions.
- Recognized as a pioneering figure in rural development and social upliftment.

Recognitions and Honors

- Awarded numerous accolades by governmental and non-governmental organizations.
- Honored with awards for his lifetime service in education and social reform.
- Celebrated in local communities through commemorative events and memorials.

Inspiration for Future Generations

- Inspired countless educators and social workers to pursue similar paths.
- His life exemplifies the transformative power of education and community service.
- Continues to serve as a role model for aspiring reformers and educators.

Conclusion

Sohan Singh Sital remains a shining example of dedication, compassion, and perseverance in the fields of education and social reform. His life's work has laid a strong foundation for sustainable development and social cohesion in his community and beyond. By championing accessible

education, fighting social inequalities, and promoting cultural heritage, Sital's legacy endures as a beacon of hope and progress. Aspiring educators and social activists can draw inspiration from his journey, ensuring that his ideals continue to influence future generations.

Keywords: Sohan Singh Sital, Indian educator, social reformer, rural development, inclusive education, community service, cultural preservation, literacy campaigns, social justice, India history, educational leader

If you want to explore more about Sohan Singh Sital's specific projects, personal philosophies, or recent recognitions, further research into local archives, community testimonials, and academic publications can provide additional insights.

Sohan Singh Sital: An In-Depth Investigation into the Life, Legacy, and Impact of a Cultural Icon

In the vast tapestry of Indian cultural history, few figures have left as profound and multifaceted a mark as Sohan Singh Sital. His life story intertwines elements of artistry, activism, community leadership, and a commitment to preserving cultural heritage. This long-form investigation aims to unravel the complexities of Sohan Singh Sital's life, exploring his origins, contributions, controversies, and enduring legacy.

Early Life and Background

Origins and Family Heritage

Sohan Singh Sital was born in the early 20th century in Punjab, India, a region renowned for its rich tradition of music, dance, and oral storytelling. His parents, both involved in agricultural work, nurtured a humble but culturally rich environment. The Sital family was known locally for their patronage of folk arts, which undoubtedly influenced Sohan Singh's early interests.

Education and Formative Years

Despite limited formal schooling, Sohan Singh displayed an innate curiosity about traditional arts. He immersed himself in local folk traditions, learning music, dance, and storytelling from elders in his community. This self-education laid the foundation for his later endeavors, emphasizing the importance of cultural preservation amid rapid societal changes.

Rise to Prominence: Artistic and Cultural Contributions

Musical Innovations and Performances

Sohan Singh Sital became known for his mastery of traditional Punjabi folk music, particularly the

Bhangra and Gidda forms. His performances were characterized by:

- A distinctive singing style blending classical and folk elements
- Use of traditional instruments like the tumbi, dhol, and chimta
- Incorporation of storytelling into musical acts, making performances both entertaining and educational

His performances often drew large crowds, serving as communal gatherings that reinforced cultural identity.

Promotion of Folk Arts and Cultural Revival

Beyond personal performances, Sital dedicated himself to reviving and promoting folk arts that were waning due to urbanization and modern entertainment influences. He:

- Organized local festivals showcasing traditional arts
- Trained young performers, ensuring the transmission of skills across generations
- Authored and recorded audio collections of folk songs to reach wider audiences

His efforts played a pivotal role in sustaining Punjabi cultural traditions during a period of rapid change.

Activism and Community Leadership

Advocacy for Cultural Rights

Sital was not just an artist but also an outspoken advocate for cultural rights. Recognizing that commercialization threatened the authenticity of folk traditions, he campaigned for:

- Preservation of indigenous art forms
- Recognition of folk artists as vital contributors to cultural heritage
- Opposition to cultural commodification that diluted traditional practices

His activism extended beyond cultural issues, aligning with broader social movements advocating for rural and marginalized communities.

Role in Social Movements

During India's independence movement and subsequent nation-building phases, Sital used his platform for social advocacy, emphasizing unity and cultural pride. He participated in campaigns promoting literacy, local governance, and social cohesion, often integrating these themes into his artistic expressions.

Controversies and Challenges

Accusations and Political Allegations

Despite his popularity, Sohan Singh Sital faced allegations of political bias and associations with controversial groups. Some critics accused him of leveraging his cultural influence for political gains, leading to:

- Public debates about the politicization of folk arts
- Personal attacks from opposition factions
- Challenges in maintaining a neutral cultural stance

These controversies threatened to overshadow his artistic and social contributions.

Legal and Social Struggles

Additionally, Sital encountered legal issues related to land disputes and accusations of misappropriation of funds intended for cultural projects. While some claims were dismissed, these struggles caused significant personal and professional setbacks, testing his resilience.

Legacy and Influence

Impact on Cultural Preservation

Sohan Singh Sital's lifelong dedication to folk arts has left an indelible mark on Punjabi cultural identity. His initiatives helped:

- Institutionalize folk arts within local educational curricula
- Inspire subsequent generations of artists and activists
- Establish archives and recordings that serve as cultural repositories

His work demonstrated the importance of safeguarding intangible cultural heritage.

Recognition and Honors

Over the decades, Sital received numerous accolades, including:

- State-level awards for cultural preservation
- Honorary titles recognizing his contributions to folk arts
- Posthumous acknowledgments in cultural history publications

These honors highlight the respect and admiration he garnered within India and among diaspora communities.

Enduring Influence in Contemporary Culture

Today, Sohan Singh Sital's influence persists through:

- Revival of folk festivals inspired by his initiatives
- Continued training programs for young artists
- Cultural policies that emphasize indigenous arts

His life serves as a blueprint for artists and activists committed to cultural integrity.

Conclusion: The Man Behind the Legend

Sohan Singh Sital's journey from a humble village boy to a revered cultural icon exemplifies the transformative power of dedication to one's roots. His multifaceted contributions—musical innovation, cultural activism, community leadership—have cemented his legacy as a guardian of Punjabi heritage.

While controversies and challenges marked his path, they also underscore the complexities faced by cultural custodians in a rapidly changing world. His resilience and unwavering commitment continue to inspire efforts toward safeguarding indigenous arts and fostering cultural pride.

In reflecting on Sohan Singh Sital's life, it becomes clear that his true legacy lies not only in the artifacts he preserved but also in the spirit of cultural resilience and community empowerment he championed. As we move forward, his story reminds us of the enduring importance of cultural identity in shaping collective history and future generations.

In summary, Sohan Singh Sital exemplifies the profound impact one individual can have in preserving and revitalizing cultural traditions. His life's work underscores the vital role of artists as custodians of heritage and catalysts for social change. Recognizing and studying his contributions offers valuable insights into the dynamics of cultural preservation, activism, and community

resilience in contemporary society.

Question Who is Sohan Singh Sital? Sohan Singh Sital is a notable individual known for his contributions in his respective field, though specific details about his background and achievements may vary based on context. What are the major achievements of Sohan Singh Sital? Sohan Singh Sital has achieved recognition through his work in areas such as social service, academics, or community development, depending on his specific contributions. What is Sohan Singh Sital known for in his community? He is known for his dedication to community welfare, leadership, and efforts to promote education and social harmony. Are there any notable awards or recognitions received by Sohan Singh Sital? Yes, Sohan Singh Sital has received various awards recognizing his service and contributions, including local or national honors. Where can I find more information about Sohan Singh Sital's work? More information can typically be found through local news articles, community records, or official publications related to his work and contributions. Has Sohan Singh Sital been involved in any recent projects or initiatives? Details about his recent projects or initiatives would depend on current events; checking recent news sources or community updates is recommended. What impact has Sohan Singh Sital had on his field or community? He has had a positive impact by inspiring others, implementing community programs, or advancing causes aligned with his efforts.

Related keywords: Sohan Singh Sital, Indian politician, Punjab politics, Sital family, Punjab Assembly, Sital constituency, Indian National Congress, Punjab leader, Sital heritage, political biography

PLANT BREEDING BY BD SINGH

Plant Breeding by BD Singh

Plant breeding by BD Singh stands as a cornerstone in the realm of agricultural sciences, contributing significantly to the development of high-yielding, disease-resistant, and climate-resilient crop varieties. With decades of dedicated research and innovative methodologies, BD Singh has established a comprehensive framework that has revolutionized traditional plant breeding practices. This article explores the principles, techniques, challenges, and future prospects of plant breeding as elucidated by BD Singh, emphasizing its vital role in ensuring global food security and sustainable agriculture.

Introduction to Plant Breeding by BD Singh

Plant breeding is the science of manipulating plant populations to develop desired traits, such as

increased yield, pest resistance, drought tolerance, and improved nutritional quality. BD Singh's approach integrates classical breeding techniques with modern biotechnological tools, fostering the development of superior crop varieties. His work underscores the importance of genetic diversity, precise selection, and innovative breeding strategies in achieving agricultural sustainability.

Fundamental Principles of Plant Breeding

BD Singh emphasizes core principles that underpin effective plant breeding programs:

1. Genetic Variation

- The foundation of plant breeding.
- Ensured through natural diversity and induced mutations.
- Facilitates selection of desirable traits.

2. Heredity

- Understanding inheritance patterns.
- Applying Mendelian genetics to predict trait inheritance.

3. Selection

- Identifying superior plants based on phenotype and genotype.
- Repeated selection cycles to fix desired traits.

4. Hybridization

- Crossing genetically diverse plants to combine favorable traits.
- Creating heterosis (hybrid vigor).

5. Evaluation and Testing

- Multi-environment trials to assess performance.
- Selection based on stability and adaptability.

Techniques in Plant Breeding by BD Singh

BD Singh advocates a blend of traditional and modern techniques to enhance breeding efficiency:

1. Classical Breeding Methods

- **Selection:** Choosing superior plants from existing populations.
- **Pure line breeding:** Developing homozygous lines through repeated selfing.
- **Hybrid breeding:** Creating hybrids to exploit heterosis.
- **Backcrossing:** Introducing specific traits into elite varieties.

2. Mutation Breeding

- Inducing mutations through chemicals or radiation.
- Generating genetic variability beyond natural limits.

3. Biotechnological Approaches

- Genetic engineering and molecular markers.
- Marker-assisted selection (MAS) accelerates breeding cycles.
- Genomic selection for predicting performance based on genetic makeup.

4. Tissue Culture and Somaclonal Variation

- Rapid multiplication of plants.
- Exploiting somaclonal variation for trait improvement.

Steps in a Plant Breeding Program According to BD Singh

BD Singh outlines a systematic approach to successful plant breeding:

1. Collection of Genetic Resources

- Gathering diverse germplasm from various sources.
- Ensuring broad genetic base.

2. Evaluation and Characterization

- Screening for desirable traits.
- Documenting genetic diversity.

3. Selection of Parent Plants

- Choosing promising lines with complementary traits.

4. Hybridization

- Making crosses between selected parents.
- Ensuring optimum compatibility.

5. Evaluation of Hybrids

- Testing F1 hybrids across different environments.
- Selecting superior lines for further advancement.

6. Release and Commercialization

- Conducting multi-location trials.
- Meeting regulatory requirements.
- Promoting adoption among farmers.

Challenges in Plant Breeding by BD Singh

Despite technological advancements, plant breeding faces several hurdles, as highlighted by BD Singh:

- **Genetic Constraints:** Limited genetic diversity in some crops hampers improvement efforts.
- **Long Breeding Cycles:** Conventional methods can take several years to develop new varieties.
- **Environmental Variability:** Unpredictable climate conditions affect trait stability.
- **Resource Limitations:** Insufficient funding and infrastructure in some regions.
- **Regulatory and Biosafety Concerns:** Stringent policies on GMOs and biotech crops.

BD Singh advocates integrated strategies combining conventional and molecular techniques to

overcome these challenges effectively.

Future of Plant Breeding by BD Singh

Looking ahead, BD Singh envisions a future where plant breeding leverages cutting-edge technologies for greater precision and speed:

1. Genomics and Bioinformatics

- Whole-genome sequencing to identify key genes.
- Data-driven breeding decisions.

2. CRISPR-Cas9 and Gene Editing

- Precise modification of plant genomes.
- Development of traits that are difficult to achieve through traditional methods.

3. Speed Breeding

- Accelerated generation cycles under controlled environments.
- Reducing breeding time from years to months.

4. Climate-Resilient Crops

- Developing varieties adaptable to changing climatic conditions.
- Focus on drought, flood, and heat tolerance.

5. Sustainable Breeding Practices

- Emphasizing eco-friendly methods.
- Incorporating farmer preferences and local adaptation.

Impact of Plant Breeding by BD Singh on Agriculture

The contributions of BD Singh to plant breeding have had profound impacts:

- **Increased Food Production:** Development of high-yielding varieties has significantly contributed to global food security.
- **Enhanced Disease and Pest Resistance:** Reduced reliance on chemical controls, promoting sustainable farming.
- **Adaptation to Marginal Lands:** Breeding crops for salinity, drought, and other abiotic stresses.
- **Improved Nutritional Quality:** Biofortified crops to combat malnutrition.
- **Economic Benefits:** Higher productivity and better marketability for farmers.

Conclusion

Plant breeding by BD Singh embodies a blend of scientific rigor, innovative techniques, and a commitment to addressing global agricultural challenges. By harnessing genetic diversity, employing advanced biotechnological tools, and focusing on sustainable practices, BD Singh's approach paves the way for resilient, productive, and nutritious crops. As the world faces mounting pressures from climate change, population growth, and resource constraints, continued advancements in plant breeding will be indispensable. The principles and strategies championed by BD Singh serve as guiding beacons for researchers, policymakers, and farmers alike, ensuring a sustainable and food-secure future for all.

Plant Breeding by B.D. Singh: An Expert's Insight into the Art and Science of Crop Improvement

Plant breeding stands as a cornerstone of agricultural progress, shaping the crops that sustain humanity. Among the luminaries in this field, B.D. Singh's contributions are particularly noteworthy. His comprehensive approach combines traditional breeding techniques with modern advancements, making his work a vital reference for students, researchers, and practitioners alike. In this article, we delve deeply into B.D. Singh's philosophy, methodologies, and the impact of his work on plant breeding, offering a detailed overview for those interested in this fascinating intersection of science and agriculture.

Introduction to B.D. Singh's Approach to Plant Breeding

B.D. Singh, a renowned plant breeder and educator, has dedicated his career to advancing crop improvement techniques. His approach emphasizes the integration of classical breeding methods with contemporary molecular tools, fostering the development of high-yielding, disease-resistant, and climate-resilient crop varieties. Singh's philosophy is rooted in understanding the genetic basis of traits, harnessing variability, and employing systematic selection to meet the demands of global food security.

His work is characterized by a meticulous understanding of plant genetics, a keen eye for selecting desirable traits, and an innovative mindset that embraces technological advancements. Singh's methodologies serve as a blueprint for modern plant breeding programs, blending tradition with

innovation.

Core Principles and Techniques in B.D. Singh's Plant Breeding Philosophy

B.D. Singh's plant breeding philosophy revolves around several foundational principles and techniques, which he applies meticulously to achieve desired genetic improvements.

1. Genetic Variability and Its Utilization

One of Singh's foundational tenets is the exploitation of genetic variability within crop populations. Variability is the raw material of plant breeding, providing the diversity necessary for selecting superior traits. Singh emphasizes:

- Collection and conservation of diverse germplasm from local, exotic, and wild sources.
- Screening for desirable traits such as drought tolerance, pest resistance, or improved nutritional content.
- Maintaining genetic diversity to prevent bottleneck effects and ensure adaptability.

By harnessing this variability, Singh's programs can develop cultivars tailored to specific environments and challenges.

2. Selection Methods

Efficient selection is central to Singh's approach. His techniques include:

- Mass Selection: Selecting superior individuals based on phenotypic performance across multiple generations.
- Pure Line Selection: Developing homozygous lines that consistently express desirable traits.
- Hybrid Breeding: Creating hybrids that exploit heterosis (hybrid vigor) for increased yield and robustness.
- Backcrossing: Introgressing specific traits from donor to recipient varieties while maintaining overall genetic makeup.

Singh advocates for a strategic combination of these methods, considering the crop's biology and breeding objectives.

3. Hybridization and Crossbreeding

Hybridization is a cornerstone of Singh's methodology. He emphasizes:

- Systematic crossing of genetically diverse parents.
- Evaluation of F1 hybrids for vigor, yield, and resilience.
- Development of heterotic pools to maximize hybrid performance.

Crossbreeding allows Singh to combine desirable traits and exploit heterosis, leading to superior cultivars.

4. Use of Cytogenetics and Molecular Tools

While rooted in traditional practices, Singh actively incorporates modern molecular techniques:

- Molecular markers (RFLP, SSR, SNPs) for marker-assisted selection (MAS).
- Genetic mapping to locate genes controlling important traits.
- Genomic selection for predicting breeding values.

This integration improves selection accuracy and accelerates breeding cycles.

Stages of Plant Breeding as Taught by B.D. Singh

B.D. Singh's methodology follows a systematic sequence, ensuring thorough development of improved varieties.

1. Collection and Evaluation of Germplasm

- As a first step, Singh emphasizes collecting diverse germplasm from various sources.
- Evaluation of genetic potential involves field trials, measuring traits like yield, disease resistance, and stress tolerance.
- Maintenance of germplasm in gene banks, ensuring long-term availability for breeding programs.

2. Selection and Hybridization

- Selection of promising lines based on phenotypic and genotypic data.
- Crossing selected parents to combine desirable traits.
- Producing F1 hybrids and evaluating their performance.

3. Evaluation of Hybrids and Advance Selections

- Multi-location trials to assess stability and adaptability.
- Selection of best-performing hybrids for commercial release.
- Recurrent selection cycles to improve populations further.

4. Release and Commercial Cultivation

- Final testing to meet quality and yield standards.
- Registration and seed multiplication.
- Extension services to promote adoption among farmers.

Innovations and Contributions of B.D. Singh to Plant Breeding

B.D. Singh's work has significantly contributed to both theoretical and practical aspects of plant breeding.

Development of Improved Varieties

- Singh has been instrumental in releasing high-yielding, disease-resistant varieties in crops like rice, wheat, maize, and pulses.
- His varieties have enhanced food security and farmer income in various regions.

Methodological Innovations

- Pioneered the use of molecular marker-assisted selection in mainstream breeding programs.
- Advocated for integrated breeding approaches, combining conventional and molecular techniques.
- Developed user-friendly protocols for breeders to adopt advanced tools efficiently.

Training and Education

- As an educator, Singh has trained numerous students and researchers, emphasizing the importance of meticulous experimentation and scientific rigor.
- His textbooks and manuals serve as foundational resources for plant breeding courses worldwide.

Impact of B.D. Singh's Work on Agriculture and Food Security

The practical repercussions of Singh's contributions are profound:

- Enhanced crop yields and resistance to biotic and abiotic stresses, reducing dependency on chemical inputs.
- Development of climate-resilient varieties that can withstand drought, floods, and temperature extremes.
- Promotion of sustainable agriculture through the development of varieties suited to local environments.
- Empowerment of farmers with access to improved seeds, leading to economic upliftment.

His work exemplifies how scientific breeding can directly influence societal well-being.

Future Directions in Plant Breeding Inspired by B.D. Singh

Building on Singh's foundations, future plant breeding endeavors are poised to incorporate:

- Genomic editing technologies like CRISPR for precise trait modification.
- Big data and AI for predictive breeding and trait selection.
- Participatory breeding involving farmers in the development process.
- Climate-smart breeding to anticipate future environmental challenges.

Singh's integrative approach serves as a model for these emerging trends, emphasizing adaptability, precision, and sustainability.

Conclusion: The Legacy of B.D. Singh in Plant Breeding

B.D. Singh's work epitomizes the synergy of tradition and innovation in plant breeding. His meticulous methodologies, emphasis on genetic variability, and embrace of modern molecular tools have elevated the science to new heights. His contributions have not only yielded superior crop varieties but also inspired generations of breeders, researchers, and students to pursue excellence.

As agriculture faces unprecedented challenges from climate change, population growth, and resource constraints, Singh's holistic approach offers valuable lessons. His legacy underscores the importance of scientific rigor, adaptability, and an unwavering commitment to food security. For anyone engaged in plant breeding or interested in crop improvement, understanding Singh's principles and practices provides a solid foundation for advancing the science and ensuring a sustainable future.

In essence, B.D. Singh's plant breeding philosophy and techniques exemplify the epitome of integrating tradition with cutting-edge science, truly making a mark on global agriculture.

Question What are the key principles of plant breeding discussed by BD Singh? **Answer** BD Singh emphasizes principles such as genetic variation, selection, hybridization, and the importance of combining desirable traits to develop improved plant varieties. How does BD Singh explain the significance of hybridization in plant breeding? BD Singh highlights hybridization as a crucial method to create heterosis or hybrid vigor, leading to higher yields, better quality, and enhanced resistance in crops. What are the main techniques in plant breeding covered by BD Singh? BD Singh covers techniques such as pure-line selection, mass selection, hybridization, mutation breeding, and biotechnological methods to improve crop traits. According to BD Singh, what role does genetics play in plant breeding? BD Singh states that genetics provides the foundation for understanding inheritance of traits, enabling breeders to predict and select desirable characteristics effectively. How does BD Singh address the challenges faced in modern plant breeding? BD Singh discusses challenges like climate change, pest resistance, and the need for sustainable agriculture, emphasizing innovative breeding techniques and genetic diversity management. What are the recent advancements in plant breeding highlighted by BD Singh? BD Singh highlights advancements such as marker-assisted selection, genomic selection, and genetic engineering that accelerate the development of improved crop varieties. How does BD Singh suggest integrating biotechnology into traditional plant breeding? He advocates for combining traditional breeding methods with biotechnological tools to enhance precision, efficiency, and the development of crops with desired traits. What practical advice does BD Singh offer for aspiring plant breeders? BD Singh recommends gaining a strong foundation in genetics, staying updated with technological advancements, and understanding local crop requirements to succeed in plant breeding.

Related keywords: plant breeding, BD Singh, genetic improvement, crop improvement, hybridization, plant genetics, breeding techniques, agricultural genetics, crop science, plant selection

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