

genetics genomics and breeding of sugarcane genetics genomics and breeding of crop plants

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Explore the pivotal roles of genetics, genomics, and advanced breeding techniques in optimizing both sugarcane and a diverse range of critical crop plants. This field delves into understanding genetic diversity, applying cutting-edge genomic tools for trait discovery, and developing innovative breeding strategies to enhance yield, bolster disease resistance, and improve nutritional profiles essential for future global food security and sustainable agriculture.

Each article has been reviewed for quality and relevance before publication.

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Genomics-Assisted Breeding Overview - Aaron Lorenz - Genomics-Assisted Breeding Overview - Aaron Lorenz by Agriculture and Natural Resources 5,352 views 6 years ago 26 minutes - Aaron Lorenz, University of Minnesota **Genomic**, assisted **breeding**, overview.

Complex traits are controlled by many small-effect alleles

A genome-wide approach typically provides better predictions

Genomic prediction models

Models are typically equivalent in performance in plant breeding scenarios

Genomic best linear unbiased prediction (G-BLUP)

Sharing of information between relatives

Spectrum of resemblance among relatives for polygenic traits

Mendelian sampling term causes deviations from expected resemblance

Ideal G matrix calculated using causal polymorphisms

Predicting GxE effects and performance in future target environments Training data

Integrating Crop Growth Models with Whole Genome Prediction through Approximate Bayesian Computation

Use of Crop Growth Models with Whole-Genome Prediction: Application to a Maize Multienvironment Trial

Training population design

Title of Project: Increase the rate of genetic gain for yield in soybean breeding programs

Uniform Soybean Tests

Summary

Acknowledgements

plbr403 - Genetic Improvement of Crop Plants - Lecture 1 - plbr403 - Genetic Improvement of Crop Plants - Lecture 1 by SciencexMedia at Global Development 27,734 views 10 years ago 41 minutes - Vernon Gracen Professor Emeritus Department of **Plant Breeding**, and **Genetics**, College of Agriculture and Life Sciences Comel ...

Basics of Genomic Selection 1: Introduction - Basics of Genomic Selection 1: Introduction by CGIAR Genetic Innovation 4,545 views 2 years ago 1 minute, 37 seconds - Giovanny Covarrubias-Pazaran (EiB) presents the **genomic**, prediction workshop and outlines the topics to be covered and guest ...

Sugarcane Integrated Breeding System - Sugarcane Integrated Breeding System by Louisiana Sugarcane 34 views 12 days ago 29 minutes - Post-doctoral research scholar Keo Corak of USDA-ARS **Genomics**, & Bioinformatics Research Unit discusses predictive ...

CRISPR's Next Advance Is Bigger Than You Think | Jennifer Doudna | TED - CRISPR's Next Advance Is Bigger Than You Think | Jennifer Doudna | TED by TED 658,838 views 5 months ago 7 minutes, 37 seconds - You've probably heard of CRISPR, the revolutionary technology that allows us to edit the DNA in living organisms. Biochemist and ...

Understanding CRISPR-Cas9 - Understanding CRISPR-Cas9 by Andrew Douch 132,429 views 1 year ago 35 minutes - This video is a deep-dive into CRISPR-Cas9, but it takes the time to explain terms and concepts carefully, so that students who are ...

Introduction

How CRISPRCas9 works

Cas9 Enzyme

Guide RNA

SG RNA

Adaptive immune response

CRISPRCas9 editing

Nonhomologous end joining

Homologous directed repair

Resection to a chi site

Inserting a foreign gene

Double strand break repair

Why doesn't CRISPRCas9 cut the bacterias own DNA

Genetics 101 | National Geographic - Genetics 101 | National Geographic by National Geographic 1,009,630 views 5 years ago 3 minutes, 13 seconds - About National Geographic: National Geographic is the world's premium destination for science, exploration, and adventure.

Intro

What is Genetics

Human Genome Project

How to sequence the human genome - Mark J. Kiel - How to sequence the human genome - Mark J. Kiel by TED-Ed 1,430,836 views 10 years ago 5 minutes, 5 seconds - Your **genome**, every human's **genome**, consists of a unique DNA sequence of A's, T's, C's and G's that tell your cells how to ...

Introduction

What is a genome

DNA binds to DNA

Reading the genome

Interpreting the sequence

An Introduction to the Human Genome | HMX Genetics - An Introduction to the Human Genome | HMX Genetics by Harvard University 252,631 views 6 years ago 5 minutes, 36 seconds - Humans are 99.9% genetically identical - and yet we are all so different. How can this be? This video, taken from a lesson in ...

What do genetics determine?

Do all humans have the same genome?

QTL Analysis Explanation and Example - QTL Analysis Explanation and Example by Katharine ME 67,320 views 7 years ago 11 minutes, 5 seconds - In this video I describe how QTL Analysis (Quantitative Trait Loci Analysis) works and give an example of how it could be used to ...

Qtl Analysis

Qtl Analysis What Is Qtl Analysis

F2 Generation

2016 Seeds Saved from Jungle Peanut Crop - WILL THEY GROW? (Feb 2024) - 2016 Seeds Saved from Jungle Peanut Crop - WILL THEY GROW? (Feb 2024) by Pecan Grove 7,226 views 2 days ago 10 minutes, 1 second - Vego Garden Raised Beds <https://glmk.io/vzw5/1dw> -- MAILING ADDRESS-

Pecan Grove P.O. Box 462 Wiggins, MS.

Crispr cas9 gene editing explained - Crispr cas9 gene editing explained by Shomu's Biology 143,094 views 3 years ago 31 minutes - Crispr cas9 **gene**, editing explained - This lecture explains about the crispr cas9 **gene**, editing mechanism. crispr cas9 explained ...

Soybean Genetic Modification - Soybean Genetic Modification by BRING_GUNS 85,871 views 10 years ago 6 minutes, 30 seconds - Basic explanation of **gene**, insertion into **plants**, via agrobacterium using soybeans as an example. Borrowed from the University of ...

Introduction

Agrabacteria

Selection Plates

Transformants

Screening for Transfer

What is a genome? - What is a genome? by Genomics Education Programme 252,380 views 5 years ago 2 minutes, 2 seconds - What is a **genome**,? Find out in this short animation developed by Health Education England's **Genomics**, Education Programme ...

CRISPR Explained - CRISPR Explained by Mayo Clinic 1,261,507 views 5 years ago 1 minute, 39 seconds - This video is an explanation of CRISPR-Cas 9. FOR THE PUBLIC: More health and medical news on the Mayo Clinic News ...

What is the difference between genetics and genomics? - What is the difference between genetics and genomics? by The Jackson Laboratory 50,777 views 7 years ago 1 minute, 8 seconds - The terms sound alike, and they are often used interchangeably. But there are some important distinctions. Healthspan vs.

Introduction to BLUP - Rex Bernardo - from Online Class: Breeding for Quantitative Traits in Plants - Introduction to BLUP - Rex Bernardo - from Online Class: Breeding for Quantitative Traits in Plants by University of Minnesota Plant Breeding Center 9,018 views 2 years ago 1 hour, 30 minutes - Dr. Rex Bernardo Professor and Endowed Chair in Corn **Breeding**, and **Genetics**, Director of the University of Minnesota **Plant**, ...

Intro

Linear vs unbiased estimation

Mixed model

Example

Linear Model

Genetic Effects

Inbreds

Mixed Model Equations

Submatrices

When is a matrix nonsymmetric

Software

Marker assisted selection - Marker assisted selection by Shomu's Biology 91,649 views 10 years ago 11 minutes, 41 seconds - This video explains the process of marker assisted selection or MAS and how it is done to develop better quality **crops**, For more ...

Plant Breeding, Plant Genetics, and Genetic Engineering - Plant Breeding, Plant Genetics, and Genetic Engineering by Zygon Center 38,557 views 8 years ago 28 minutes - Description.

Itaraju Brum: Performance of genomic prediction for a sugarcane commercial breeding program - Itaraju Brum: Performance of genomic prediction for a sugarcane commercial breeding program by Cornell SIPS 214 views 5 years ago 49 minutes - Itaraju Brum, **Plant Breeding**, and **Genetics**, Section **Plant Breeding**, and **Genetics**, Special Seminar July 31, 2018 More seminar ...

Overview of the Building Program

Molecular Marker Data

Focus on Predicting Parental Breathing Values

The H Matrix

Linear Mixed Model

Results

Remarks

Comparison between Markers and Pedigree Prediction

Continuous Coding of the Genotype

Genomic Selection Part 1 | Why Genomic Selection | - Genomic Selection Part 1 | Why Genomic Selection | by vikas mangal 5,638 views 4 years ago 5 minutes, 17 seconds - Why **Genomic**, Selection ???

Genomic Selection: an Industry Perspective; David Habier, Hsiao-Yi Hung - Genomic Selection: an Industry Perspective; David Habier, Hsiao-Yi Hung by National Association of Plant Breeders 1,160 views 10 months ago 1 hour, 1 minute - Use of **genomic**, prediction in **plant breeding**, programs Cross-validation of **genomic**, prediction in Corteva How to interpret ...

SRA Webinar: Accelerating Development of New Sugarcane Varieties with Genomics - SRA Webinar: Accelerating Development of New Sugarcane Varieties with Genomics by Sugar Research Australia 118 views 1 month ago 1 hour, 22 minutes - The first SRA webinar of the 2024 series featured Professor Ben Hayes presenting on the Accelerating development of new **sugar**, ...

Traditional Plant Breeding vs. Genetic Modification (GM) - Traditional Plant Breeding vs. Genetic Modification (GM) by Agroecology 103 3,661 views 3 years ago 4 minutes, 9 seconds - Our colleague Irwin Goldman explains some advantages and disadvantages of traditional **plant breeding**, and **genetic**, ...

Natural Science II: Genomes and Diversity - Plant Genes and Genomes & Breeding - Natural Science II: Genomes and Diversity - Plant Genes and Genomes & Breeding by New York University 4,842 views 12 years ago 1 hour, 13 minutes - Mark Siegal.

Intro

Plants = food

The origin of agriculture

Major changes from wild ancestors

The Green Revolution

Green Revolution in a single gene

Other traits of interest to breeders

Arabidopsis: the "Drosophila" of plants

Example: salt tolerance in rice

Example: starch quality in rice

Matching traits to genes

Traditional breeding

Definition: allele

Understanding Quantitative Trait Loci with the help of tomatoes - Understanding Quantitative Trait Loci with the help of tomatoes by The Genetic Basis of Stuff and Things 16,659 views 2 years ago 5 minutes, 1 second - A review of: Resolution of quantitative traits into Mendelian factors by using a complete linkage map of restriction fragment length ...

Genomic selection | Introduction to genomics theory | Genomics101 (beginner-friendly) - Genomic selection | Introduction to genomics theory | Genomics101 (beginner-friendly) by Genomics Boot Camp 4,174 views 2 years ago 37 minutes - GenomicSelection is the state-of-art method to identify individuals with the highest **breeding**, value and increase the **genetic**, gain ...

Summary from previous lectures

Introduction

The concept of traditional breeding values

Marker-assisted selection

Genomic selection (GS)

Personal comments on GS

The genomic breeding scheme

Impact of GS on genetic gain

Steps in GS

Single-step GS

Acknowledgements

Summary of the lecture

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of India, Southeast Asia, and New Guinea. Grown in tropical and subtropical regions, sugarcane is the world's largest crop by production quantity, totaling... 75 KB (7,902 words) - 04:03, 6 March 2024

Domestication of Foxtail Millet". In Doust, Andrew; Xianmin Diao (eds.). Genetics and Genomics of Setaria. Plant Genetics and Genomics: Crops and Models. Vol... 27 KB (2,606 words) - 14:45, 16

December 2023

Plant disease resistance protects plants from pathogens in two ways: by pre-formed structures and chemicals, and by infection-induced responses of the... 64 KB (7,368 words) - 12:22, 11 December 2023

| Plants of the World Online | Kew Science". Retrieved 2017-07-02. Henry RJ, Kole C (15 August 2010). Genetics, Genomics and Breeding of Sugarcane. CRC... 102 KB (5,152 words) - 21:57, 21 February 2024

Qifa; Sorrells, Mark (2021). "Designing Future Crops: Genomics-Assisted Breeding Comes of Age". Trends in Plant Science. 26 (6): 631–649. doi:10.1016/j.tplants... 20 KB (1,809 words) - 15:55, 6 February 2024

3000 BCE. Several plants were cultivated, later to be replaced by the Three Sisters cultivation of maize, squash, and beans. Sugarcane and some root vegetables... 124 KB (13,234 words) - 13:40, 24 February 2024

Zhukuan (March 2014). "Ten years of gene discovery for meiotic event control in rice". Journal of Genetics and Genomics. 41 (3): 125–137. doi:10.1016/j... 73 KB (6,934 words) - 09:15, 29 February 2024

flowering plants. A considerable amount of new knowledge about plant function comes from studies of the molecular genetics of model plants such as the... 135 KB (14,209 words) - 15:58, 23 February 2024

organism for genetics and developmental biology. The MADS-box motif is involved in the development of maize flowers. The Maize Genetics and Genomics Database... 83 KB (8,661 words) - 09:51, 3 March 2024

bruxellensis genomic landscape: comparative genomics reveals variations in ploidy and nutrient utilisation potential amongst wine isolates". PLOS Genetics. 10... 81 KB (8,802 words) - 10:17, 3 March 2024

the genetic diversity of this staple crop and aiding breeding to select for particular characteristics. A reference genotype of pearl millet (Tift 23D2B1-P1-P5)... 28 KB (2,906 words) - 18:25, 2 January 2024

sometimes also known as "canoe plants", especially in the context of the Polynesian migrations. Domesticated animals and plants introduced during historic... 260 KB (25,518 words) - 04:23, 26 February 2024

third-highest yield of carbohydrates per cultivated area among crop plants, after sugarcane and sugar beets. Cassava plays a particularly important role in... 84 KB (8,479 words) - 06:06, 5 March 2024

also used to plow fields for crops that grow on dry land, like corn, sugarcane, or upland rice. Another older method of preparing fields with the carabao... 42 KB (4,446 words) - 14:03, 3 March 2024

are more than 400 commodity crops grown across California, including a significant portion of all fruits, vegetables, and nuts in the United States. In... 361 KB (35,503 words) - 17:04, 3 March 2024

fields of molecular genetics and genomics, Mohapatra is an elected fellow of the National Academy of Sciences, India, the National Academy of Agricultural... 20 KB (1,682 words) - 18:12, 7 March 2024

Austrian monk who is often called the "father of genetics" for his study of the inheritance of traits in pea plants Édouard Ménétries (1802–1861), French entomologist... 165 KB (20,769 words) - 20:49, 24 February 2024

of grasses and grain crops such as corn, but the species has been noted to consume over 80 different plants (50 non-economic and 30 economic plants)... 49 KB (4,971 words) - 06:23, 19 February 2024

to observe and experiment with plants, learning how they grew and developed. This new knowledge led to the domestication of plants into crops. Archaeological... 96 KB (10,370 words) - 12:32, 2 March 2024

agriculturally important plants, including coconut, sugarcane, sandalwood, and cannabis, as well as horticultural crops like sweet cherry, peaches, and nectarines in... 64 KB (5,415 words) - 20:18, 1 February 2024