International Journal of Computer Science
Scholarly Peer Reviewed Research Journal - PRESS - OPEN ACCESS
ISSN: 2348-6600
http://www.ijcsjournal.com Volume 10, Issue 1, No 7, 2022. ISSN: 2348-6600
Reference ID: IJCS-420 PAGE NO: 2826-2827

Genome Based Plant Prevention

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Abstract - In the fields of molecular biology and genetics, a genome is the genetic material of an organism. It consists of DNA (or RNA in RNA viruses). The genome includes both the genes (the coding regions) and the noncoding DNA, as well as mitochondrial DNA and chloroplast DNA. The study of the genome is called genomics. In our project Genome based plant disease prevention system we have used ARDUINO as a microcontroller unit which will smartly senses the plant moisture level, water level and alerts the farmer when the plan is over watered. It also identifies the over exposure in sunlight by sensing the temperature and triggers the short SMS to farmer by alerting them regarding genome based predicted disease. By this alerting method we have also sending the precaution steps to avoid plant disease and by taking necessary steps the plant disease can be prevented earlier.

Index Terms – DNA, RNA, Arduino, SMS.

I. INTRODUCTION

Until very recently, the molecular analysis of plants often focused on the single gene level. Recent technological advances have changed this paradigm, enabling the analysis of organisms in terms of genome organization, expression and interaction. The study of the way genes and genetic information are organized within the genome, the methods of collecting and analyzing this information, and how this organization determines their biological functionality is referred to as genomics. Genomic approaches are permeating every aspect of plant biology, and since they rely on DNA-coded information, they expand molecular analyses from a signal to a multi1.species level. Plant genomics is reversing the previous paradigm of identifying genes behind biological functions and instead focuses on finding biological functions behind genes. It also reduces the gap between phenotype and genotype and helps to comprehend not only the isolated effect of a gene, but also the way its genetic context and the genetic networks it interacts with can modulate its activity. This review is organized into two main sections. The first deals with the current understanding of plant genomes, their genetic structure at the inter- and intra- species level and how whole genomes are sequenced, and its second section addresses some approaches used in order to achieve the final aim of genomics: finding the biological and functional significance of DNA sequence.

II. EXISTING SYSTEM

Fungicide can be a useful preventative measure for gardeners with plants that are especially prone to rot and disease. If you're concerned about adding chemicals to your garden, depending on the condition and the disease, there are some natural alternatives

Disadvantages:

1. Milk is known as an effective treatment for powdery mildew. Mix a 50:50 milk to water solution in a spray bottle and apply to leaves of plants.
2. Sulfur in dust form can keep disease at bay. Be sure to apply while wearing a mask so the dust doesn't irritate your eyes and mouth.
3. The "Cornell Formula" is a well-known natural fungicide, which includes mixing 1 tablespoon baking soda, 1 tablespoon horticultural oil and 1 to 2 drops dishwashing liquid.

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III. PROPOSED SYSTEM

Many plant diseases can quickly return if the dead plant matter isn't properly disposed of. In fact, most fungal, bacterial and viral plant diseases are spread naturally by wind currents, rain, soil seeds, insects and other animals. Others can survive on nearby dead plants or infected gardening tools. When you think you've collected all of the dead plant, follow these disposal tips

Advantages:

1. For less persistent diseases like powdery mildew, simply removing from live plants and allow to die off in compost. If you don't have a compost at home, check with your local government for a nearby green waste centre.
2. For leaves or fruits with rot, burying the decay in a 1 foot deep hole will work.
3. Dry, woody material like branches can be disposed of by setting a small bonfire. Be sure to handle on a non-windy day to reduce the risk of the fire spreading.
4. Infected bulbs, small wooden pruning and collapsed seedling can be tossed into your home garbage can.

IV. RESULTS AND DISCUSSION

The current understanding of plant biology is limited by our understanding of gene function in the context of whole organism biology. Even in Arabidopsis, only a fraction of its genes have been characterized from a molecular standpoint. This paradigm is being challenged by a myriad of genomic approaches available to researchers that allow the identification of putative genes and the validation of their biological functionality through functional approaches. Furthermore, used in combination with genetics, genomics adds another level of understanding to plant biology through the integrated analysis of different species.

The large number of genes handled simultaneously by genomics sets a new paradigm in plant biology, since it allows the genetic integration of diverse processes, tissues and organisms. It is expected that a significant proportion of such information will be transferred to plant improvement programs and will thus contribute to meeting the increasing food requirements of the world.

Plant genomics will revolutionize the study of the molecular basis of plant biology. The traditional hypothesis-driven approach will be gradually transformed into an unbiased data collection at the tissue/organism level approach followed by bioinformatic analyses.

Finally, genomics is the ultimate interdisciplinary approach, as it covers the entire spectrum from DNA sequencing to field-based research. Only through the integrated endeavor of genetics, biology, bioinformatics, molecular biology, engineering, microbiology and related fields will the extensive benefits of genomics to mankind become reality.

V. CONCLUSION

Plant genomics will revolutionize the study of the molecular basis of plant biology. The traditional hypothesis-driven approach will be gradually transformed into an unbiased data collection at the tissue/organism level approach followed by bioinformatic analyses. Finally, genomics is the ultimate interdisciplinary approach, as it covers the entire spectrum from DNA sequencing to field-based research. Only through the integrated endeavor of genetics, biology, bioinformatics, molecular biology, engineering, microbiology and related fields will the extensive benefits of genomics to mankind become reality.

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