SIMATS SCHOOL OF ENGINEERING

SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES

CHENNAI-602105

Best Crop Pesticides

A CAPSTONE PROJECT REPORT

Submitted in the partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

Submitted by

K. Shashi vardhan Reddy(192211796)

A. Surya(192211797)

Under the Supervision of

Dr. A. Moorthy

September 2024

DECLARATION

We, **Shashi and Surya** students of **Bachelor of Engineering in Computer Science and Engineering**, Department of Computer Science and Engineering, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, hereby declare that the work presented in this Capstone Project Work entitled vehicle rental system is the outcome of our own bona fide work and is correct to the best of our knowledge and this work has been undertaken taking care of Engineering Ethics.

K. Shashi(192211796)

A. Surya(192211797)

CERTIFICATE

This is to certify that the project entitled **"Best Crop Pesticides"** submitted by **Shashi vardhan Reddy and Surya** has been carried out under my supervision. The project has been submitted as per the requirements in the current semester of B. Tech Information Technology.

Teacher-in-charge

Dr. A. Moorthy

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Abstract

The increasing global demand for sustainable agricultural practices has made the identification and use of effective crop pesticides a crucial area of research. This capstone project focuses on evaluating and recommending the best crop pesticides that maximize pest control efficiency while minimizing environmental and health risks. Through a comprehensive analysis of pesticide efficacy, toxicity levels, environmental impact, and cost-effectiveness, the project aims to provide a practical guide for farmers and agricultural stakeholders.

Data will be collected from agricultural case studies, scientific research, and field experiments to evaluate different categories of pesticides, including chemical, organic, and biological solutions. Advanced analytical methods will be employed to compare the effectiveness of each pesticide against common pests, considering factors such as crop type, climate conditions, and pest resistance

The final outcome will include recommendations for specific pesticides tailored to various crop types, regions, and sustainability goals, with a focus on optimizing crop yield while adhering to environmental safety standards. This project is expected to contribute valuable insights into eco-friendly and effective pest control strategies, supporting both agricultural productivity and sustainability initiatives.

Introduction

Agriculture plays a vital role in sustaining the global population, yet one of its greatest challenges remains the effective management of pests that threaten crop productivity. Pesticides have long been a critical tool for controlling pests, but the widespread use of chemical pesticides has raised concerns regarding their impact on human health, biodiversity, and the environment. In recent years, the demand for sustainable agricultural practices has spurred research into alternative pest control methods, including organic and biological pesticides.

This project seeks to explore the landscape of crop pesticides by identifying the best solutions that balance efficiency in pest management with minimal environmental and health hazards. Through a detailed analysis of various pesticide types—chemical, organic, and biological—the project aims to provide comprehensive insights into their performance, cost-effectiveness, and ecological impact. Understanding the advantages and limitations of different pesticide options is crucial for farmers, policymakers, and agricultural stakeholders who seek to optimize crop yields while embracing sustainable farming practices.

The research will involve reviewing current literature, conducting field studies, and analyzing real-world case studies to evaluate pesticide efficacy across diverse crop types and pest species. By comparing traditional chemical pesticides with emerging eco-friendly alternatives, this study will offer recommendations for the best crop protection strategies that align with modern agricultural goals of sustainability and environmental stewardship.

Problem understanding

- **Excessive Use of Chemical Pesticides**: Farmers predominantly rely on chemical pesticides due to their quick results and broad-spectrum effects. However, overuse has led to environmental pollution, soil degradation, and harm to beneficial organisms such as pollinators and natural predators of pests.
- **Pesticide Resistance**: Many pests are developing resistance to commonly used chemical pesticides. This resistance forces farmers to apply higher doses or use more potent chemicals, increasing costs and risks to health and the environment.
- **Health and Environmental Risks**: Chemical pesticides are linked to several health risks, including respiratory issues, neurological disorders, and other chronic illnesses. Additionally, these chemicals contaminate water sources and affect non-target species, contributing to ecological imbalances.
- **Limited Adoption of Organic and Biological Alternatives:** Despite the availability of organic and biological pesticides, their adoption remains low due to higher costs, limited

availability, and reduced effectiveness compared to chemical pesticides, especially in severe pest infestations.

- **Lack of Awareness and Education**: Many farmers lack proper knowledge about the benefits of integrated pest management (IPM) and sustainable pest control techniques. As a result, they may continue to rely on outdated practices that harm both their crops and the environment.

LITERATURE REVIEW

TITLE: Best Crop Pesticide

The use of pesticides in agriculture has a long history, evolving from simple natural solutions to complex synthetic chemicals. The literature on crop pesticides is vast and diverse, covering a range of topics including the efficacy of different pesticide types, their environmental impact, and the challenges associated with resistance development. This review focuses on three primary categories of pesticides—chemical, organic, and biological—and examines their role in modern agriculture, as well as the ongoing shift towards more sustainable practices.

1. Chemical Pesticides: Efficacy and Concerns

Chemical pesticides, such as organophosphates, carbamates, and pyrethroids, have been widely used for decades due to their effectiveness in controlling a broad spectrum of pests. Studies, such as that by Zhang et al. (2018), highlight their success in increasing crop yields and reducing pest populations. However, long-term reliance on these pesticides has led to several negative consequences. According to Pimentel and Burgess (2014), the extensive use of synthetic pesticides has contributed to the development of pesticide-resistant pests, making pest management increasingly difficult and costly.

2. Organic Pesticides: An Environmentally Friendly Option

Organic pesticides, derived from natural sources such as plants and minerals, are often promoted as safer alternatives to chemical pesticides. Research by Isman (2017) shows that organic pesticides, including neem oil, pyrethrins, and essential oils, can be effective against a range of pests while posing fewer risks to human health and the environment. Organic pesticides generally degrade more quickly than synthetic chemicals, reducing the risk of long-term contamination.

3. Biological Pesticides: Sustainable Pest Control

Biological pesticides, or biopesticides, are derived from natural organisms such as bacteria, fungi, and viruses. They are increasingly recognized as a sustainable alternative to chemical pesticides. According to Glare et al. (2012), biopesticides offer a targeted approach to pest control, with minimal impact on non-target organisms and ecosystems. Examples include Bacillus thuringiensis (Bt), which has been widely used in both conventional and organic farming, and fungal biopesticides like Beauveria bassiana, which attack specific insect pests.

4. Integrated Pest Management (IPM): A Holistic Approach

Integrated Pest Management (IPM) has emerged as a widely accepted strategy that combines chemical, organic, and biological control methods to optimize pest management. IPM aims to reduce the reliance on chemical pesticides by using them only as a last resort, while prioritizing biological and organic solutions, crop rotation, and other preventive measures (Ehler, 2006). Studies, such as that by Pretty and Bharucha (2015), demonstrate that IPM can significantly reduce pesticide use, lower costs, and enhance crop resilience to pests.

Conclusion

The literature highlights the strengths and limitations of various pesticide types, underscoring the complexity of achieving effective pest control while minimizing environmental and health risks. Chemical pesticides offer high efficacy but pose significant ecological and health concerns. Organic pesticides provide a safer alternative, though their cost and limited efficacy remain challenges. Biological pesticides represent a promising sustainable option, but they require further development to overcome practical limitations. Integrated Pest Management (IPM) stands out as a holistic approach, combining the strengths of different pest control methods while reducing the drawbacks associated with any single strategy.

Existing System

The current system for crop pesticide management in agriculture is primarily reliant on chemical pesticides, although organic and biological pesticides are gaining traction. Integrated Pest Management (IPM) strategies are also being introduced to reduce the dependency on chemical pesticides. Below is an overview of the main components of the existing system:

1. Chemical Pesticides**:**

Chemical pesticides dominate pest control in most agricultural systems. These include:

- **Insecticides** (for controlling insects),
- **Herbicides** (for controlling weeds),
- **Fungicides** (for controlling fungi),
- **Rodenticides** (for controlling rodents).

Chemical pesticides are widely used because of their **quick action**, **broad-spectrum efficacy**, and **ease of availability**. However, they come with significant drawbacks:

- **Pest Resistance**: Over time, many pests have developed resistance to commonly used chemical pesticides, reducing their effectiveness.
- **Environmental Impact**: Chemical pesticides often cause soil degradation, water contamination, and harm to non-target species, including beneficial insects and pollinators like bees.
- **Health Risks**: Prolonged exposure to chemical pesticides has been linked to various health problems in humans, including respiratory diseases and cancer.

2. Organic Pesticides**:**

Organic pesticides are derived from natural sources such as plants, minerals, and microbial organisms. These are mainly used in **organic farming** systems and are gaining acceptance in conventional agriculture due to:

- **Lower toxicity** to humans and animals,
- **Reduced environmental impact**. Common examples include **neem oil**, **pyrethrins**, and **diatomaceous earth**.

Despite their benefits, organic pesticides have limitations:

- **High Cost**: Organic pesticides tend to be more expensive than chemical ones.
- **Lower Efficacy**: They often require frequent application and may not be as effective in severe pest infestations.

3. Biological Pesticides (Biopesticides)**:**

Biopesticides are derived from natural organisms, such as bacteria, fungi, or viruses, and offer a more sustainable pest control alternative. Examples include **Bacillus thuringiensis (Bt)**, a bacterial pesticide commonly used to control insect larvae, and **Trichoderma** fungi, used to manage plant pathogens.

Proposed System

The proposed system for the "Best Crop Pesticides" project aims to enhance pest management by integrating sustainable, effective, and eco-friendly pesticide strategies. The system will focus on a data-driven, multi-dimensional approach that combines the strengths of chemical, organic, and biological pesticides while minimizing their weaknesses. The goal is to provide farmers with a customizable, efficient pest control solution that prioritizes crop health, environmental safety, and long-term sustainability.

1. Hybrid Pest Control Strategy

The core of the proposed system is a hybrid pest control strategy that leverages the complementary strengths of different pesticide types. This system will prioritize:

- Chemical Pesticides: Used as a last resort or in cases of severe pest infestation to reduce over-reliance and prevent resistance.
- Organic Pesticides: Promoted for regular use due to their lower environmental impact and safer profile for human health.
- Biological Pesticides: Integrated into the system for targeted pest control, minimizing harm to beneficial organisms and promoting biodiversity.

This balanced approach will be implemented using an integrated platform that dynamically adjusts pesticide recommendations based on real-time data, pest pressure, and environmental conditions.

2. Data-Driven Pest Management

The proposed system will incorporate advanced data analytics to make pest control more efficient and precise. Key features include:

- Pest Monitoring and Prediction: Real-time data from sensors and weather stations will be used to monitor pest activity and predict outbreaks. Historical data will help anticipate pest lifecycles and optimize pesticide application timing.
- Pesticide Selection Algorithm: A machine-learning algorithm will analyze pest data, crop type, and environmental conditions to recommend the best combination of chemical, organic, and biological pesticides. The goal is to minimize chemical use while ensuring effective pest control.

3. Integrated Pest Management (IPM)

IPM principles will be at the heart of the proposed system. The system will incorporate:

- Cultural Practices: Recommendations for crop rotation, intercropping, and soil health improvement to reduce pest populations naturally.
- Mechanical and Physical Controls: Strategies such as traps, barriers, and handpicking pests to minimize pesticide use.
- Pest-Specific Solutions: Customized solutions based on the type of pest and crop, avoiding one-size-fits-all approaches. The system will suggest biological or organic solutions as a first line of defense, only resorting to chemical solutions when necessary.

4. Sustainability and Environmental Monitoring

The proposed system will emphasize sustainability by:

- Reducing Chemical Use: Implementing strict thresholds for chemical pesticide application to limit environmental contamination and reduce the risk of resistance.
- Promoting Eco-Friendly Alternatives: Offering incentives for farmers to use organic and biological pesticides, which are less harmful to ecosystems.
- Environmental Impact Assessment: Regular monitoring of soil health, water quality, and biodiversity will be conducted to assess the impact of pesticide use. The system will adjust recommendations based on environmental feedback to minimize negative impacts.

IMPLEMENTATION

HTML Code:

- <!DOCTYPE html>
- <html>
- <head>
- <meta name="viewport" content="with=device-width, intial-scale=1.0">
- <title>Crops and Pesticides - Easy Tutorials</title>
- <link rel="stylesheet" href="style.css">
- <link rel="https://cdn.jsdelivr.net/npm/@fortawesome/fontawesome-free@6.6.0/css/fontawesome.min.css">
- </head>
- <body>
- <section class="header">
- <nav>

- <img src="images/brandlogo.png">
- <div class="nav-links" id="navLinks">
- <i class="fa fa-times" onclick="hideMenu()"></i>
-
- HOME
- ABOUT US
- CROPS
- PESTICIDES
- CONTACT
-
- </div>
- <i class="fa fa-bars" onclick="showMenu()"></i>
- </nav>
- <div class="text-box">
- <h1>BEST CROP PESTICIDES</h1>
- <P>It is used to eliminate or control a variety of agricultural pests that can damage crops and livestock and reduce farm productivity. The most commonly applied pesticides are insecticides to kill insects, herbicides to kill weeds, rodenticides to kill rodents, and fungicides to control fungi, mould, and mildew.</P>
- Visit Us To Know More
- </div>
- </section>
- <section class="Pesticides">
- <h1>Pesticides We Offer</h1>
- <p>Tomota : Bacillus thuringiensis, Spinosad, and pyrethrin</p>
- <p>Paddy : Ammonium sulphate</p>
- <p>Ground Nuts : Antracol,Ammonium sulphate</p>
- <p>Corn : glyphosate,genium</p>
- <p>Wheat : Topaz,Glyphospate</p>

- <div class="row">
- <div class="Pesticides-col">
- <h3>Crop Pesticides</h3>
- <p>Tomota : Bacillus thuringiensis, Spinosad, and pyrethrin</p>
- <p>Paddy : Ammonium sulphate</p>
- <p>Ground Nuts : Antracol,Ammonium sulphate</p>
- <p>Corn : glyphosate,genium</p>
- <p>Wheat : Topaz,Glyphospate</p>
- </div>
- <div class="Pesticides-col">
- <h3>Crop Seasons</h3>
- <p>Tomota : Spring Season</p>
- <p>Paddy : Rainy season</p>
- <p>Ground Nuts : Rainy season or Summer Season</p>
- <p>Corn : Spring Season or Summer Season</p>
- <p>Wheat : Rainy season</p>
- </div>
- <div class="Pesticides-col">
- <h3>Crop Diseases</h3>
- <p>Tomota : Fungai</p>
- <p>Paddy : Insecteside</p>
- <p>Ground Nuts : Nut size and fungai</p>
- <p>Corn : Insectiside</p>
- <p>Wheat : Insectiside and Fungai</p>
- </div>
- </div>
- </section>
- <section class="Crops">

- <h1>Different Types of Crops</h1>
- <p>Tomoto, Wheat, Corn, Paddy, Groundnut</p>
- <div class="row">
- <div class="Crops-col">
- <img src="images/tomoto.jpg">
- <div class="layer">
- <h3>TOMOTO</h3>
- </div>
- </div>
- <div class="Crops-col">
- <img src="images/wheat1.jpg">
- <div class="layer">
- <h3>WHEAT</h3>
- </div>
- </div>
- <div class="Crops-col">
- <img src="images/corn2.jpg">
- <div class="layer">
- <h3>CORN</h3>
- </div>
- </div>
- <div class="Crops-col">
- <img src="images/p1.webp">
- <div class="layer">
- <h3>PADDY</h3>
- </div>
- </div>
- <div class="Crops-col">

- <img src="images/ground1.jpg">
- <div class="layer">
- <h3>GROUND NUT</h3>
- </div>
- </div>
- </div>
- </section>
- <section class="cta">
- <h1>Contact us from Any where</h1>
- CONTACT US
- </section>
- <section class="footer">
- <h4>ABOUT US</h4>
- <P>We can store should be large enough to accommodate the quantities of pesticides planned for storage. A further 15 percent capacity should be included to allow for stock movement and possible future needs, in addition to space for dispensing and repacking insecticides and for empty containers.</P>
- <p>We will provide best crop pesticides to the customers.</p>
- <div class="icons">
- <i class="fa fa-facebook"></i>
- <i class="fa fa-twitter"></i>
- <i class="fa fa-instagram"></i>
- <i class="fa fa-linkedin"></i>
- </div>
- </section>
- <script>
- var navLinks = documnet.getElementById("navLinks");
- function showMenu(){
- navLinks.style.right="0";

- }
- function hideMenu(){
- navLinks.stylr.right="-200px";
- }
- </script>
-
- </body>
- </html>

Css :-

- *{
- margin: 0;
- padding: 0;
- }
- .header{
- min-height: 100vh;
- width: 100%;
- background-image: linear-gradient(rgba(4,9,30,0.7),rgba(4,9,30,0.7)),url(images/banner.jpg);
- background-position: center;
- background-size: cover;
- position: relative;
-
- }
- nav{
- display: flex;

- padding: 2% 6%;
- justify-content: space-between;
- algin-items:center;
- }
- nav img{
- width: 150px;
- }
- .nav links{
- flex: 1;
- text-algin: right;
- }
- .nav-links ul li{
- list-style: none;
- display: inline-block;
- padding: 8px 12px;
- position: relative;
- }
- .nav-links ul li a{
- color: #fff;
- text-decoration: none;
- font-size: 13px;
- }
- .nav links ul li::after{
- content: '';
- width: 0%;
- height: 2px;
- background: #f44336;
- display: block;

- margin: auto;
- transition: 0.5s;
- }
- .nav links ul li:hover::after{
- width: 100%;
- }
- .text-box{
- width: 90%;
- color: #fff;
- position: absolute;
- top: 50%;
- left: 50%;
- transform: translate(-50%,-50%);
- text-align: center;
- }
- .text-box h1{
- font-size: 62px;
- }
- .text-box p{
- margin: 10px 0 40px;
- font-size: 14px;
- color: #fff;
- }
- .hero-btn{
- display: inline-block;
- text-decoration: none;
- color: #fff;
- border: 1px solid #fff;

- padding: 12px 34px;
- font-size: 13px;
- background: transparent;
- position: relative;
- cursor: pointer;
- }
- .hero-btn:hover{
- border: 1px solid #f44336;
- background: #f44336;
- transition: 1s;
- }
- nav .fa{
- display: none;
- }
- @media(max-width: 700px){
- .text-box h1{
- font-size: 20px;
- }
- .nav links ul li{
- display: block;
- }
- .nav links{
- position: absolute;
- background: #f44336;
- height: 100vh;
- width: 200px;
- top: 0;
- right: -200px;

- text-align: left;
- z-index: 2;
- transition: 1s;
- }
- nav .fa{
- display: block;
- color: #fff;
- margin: 10px;
- font-size: 22px;
- cursor: pointer;
- }
- }
- .Pesticides{
- width: 80%;
- margin: auto;
- text-align: center;
- padding-top: 100px;
- }
- h1{
- font-size: 36px;
- font-weight: 600;
- }
- p{
- color: #777;
- font-size: 14px;
- font-weight: 300;
- line-height: 22px;
- padding: 10px;

- }
- .row{
- margin-top: 5%;
- display: flex;
- justify-content: space-between;
- }
- .Pesticides-col{
- flex-basis: 31%;
- background: #fff3f3;
- border-radius: 10px;
- margin-bottom: 5%;
- padding: 20px 12px;
- box-sizing: border-box;
- transition: 0.5s;
- }
- h3{
- text-align: center;
- font-weight: 600;
- margin: 10px 0;
- }
- .Pesticides-col:hover{
- box-shadow: 0 0 20px 0px rgba(0,0,0,0.2);
- }
- .Crops{
- width: 80%;
- margin: auto;
- text-align: center;
- padding-top: 50px;

- }
- .Crops-col{
- flex-basis: 32%;
- border-radius: 10px;
- margin-bottom: 30px;
- position: relative;
- overflow: hidden;
- }
- .Crops-col img{
- width: 100%;
- display: block;
- }
- .layer{
- background: transparent;
- height: 100%;
- width: 100%;
- position: absolute;
- top: 0;
- left: 0;
- transition: 0.5s;
- }
- .layer:hover{
- background: rgba(226,0,0,0.7);
- }
- .cta{
- margin: 100px auto;
- width: 80%;

- background-image: linear-gradient(rgba(0,0,0,0.7),rgba(0,0,0,0.7)),url(images/banner.jpg);
- background-position: center;
- background-size: cover;
- border-radius: 10px;
- text-align: center;
- padding: 100px 0;
- }
- .cta h1{
- color:#fff;
- margin-bottom: 40px;
- padding: 0;
- }
- .footer{
- width: 100%;
- text-align: center;
- padding: 30px 0;
- }
- .footer h4{
- margin-bottom: 25px;
- margin-top: 20px;
- font-weight: 600;
- }
- .sub-header{
- height: 50vh;
- width: 100%;
- background-image: linear-gradient(rgba(4,9,30,0.7),rgba(4,9,30,0.7)),url(images/banner.jpg);
- background-position: center;

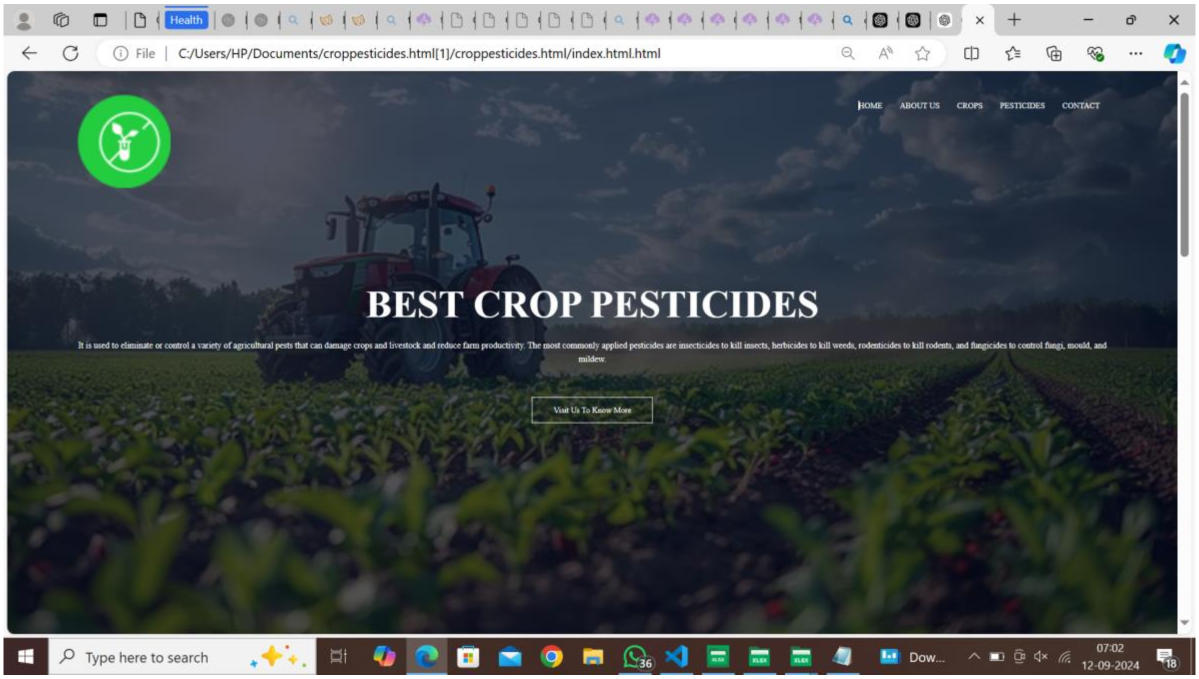
- background-size: cover;
- text-align: center;
- color: #fff;
- }
-
- .ABOUT-US{
- width: 80%;
- margin: auto;
- padding-top: 80px;
- padding-bottom: 50px;
-
- }
- .ABOUT-US{
- flex-basis: 48%;
- padding: 30px 2px;
- }
- .about-colimg{
- width: 100%;
- }
- .about-col h1{
- padding-top: 0;
-
- }
- .about-col p{
- padding: 15px;
- }
- .red-btn{
- border: 1px solid #f44336;

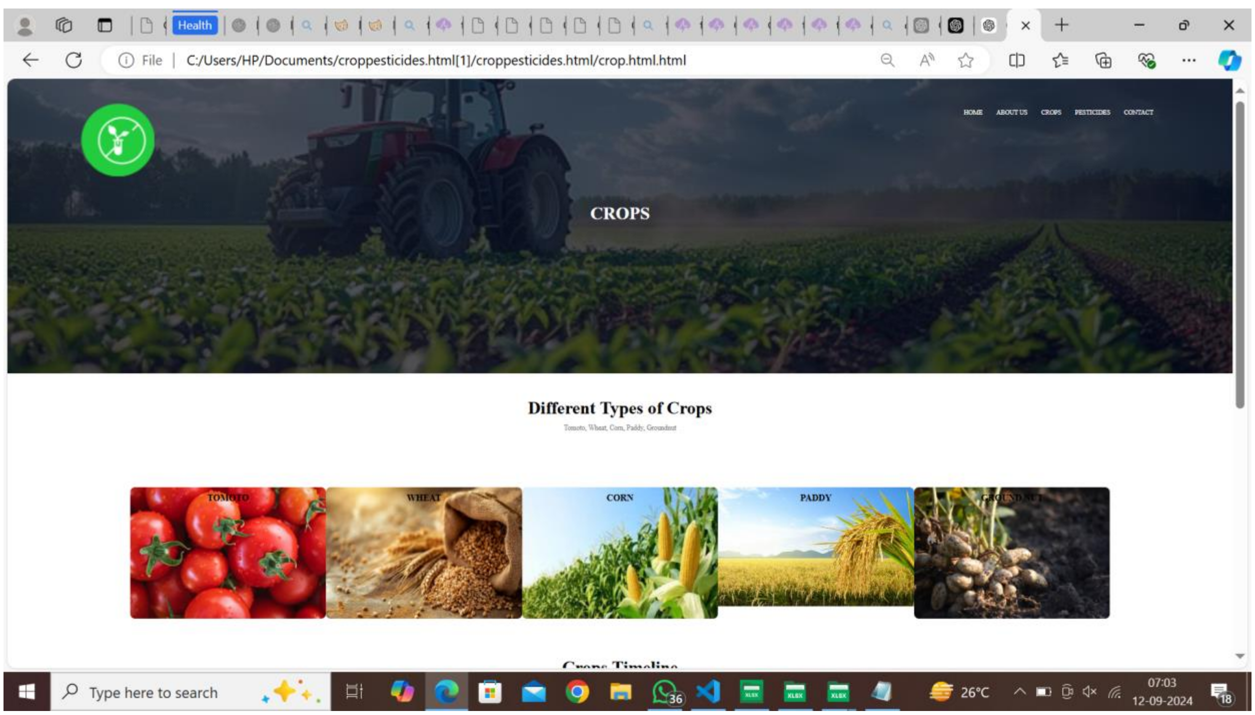
- background: transparent;
- color: #f44336;
- }
- .red-btn:hover{
- color: #fff;
- }
- .comment-box{
- border: 1px solid #ccc;
- margin: 50px 0;
- padding: 10px 20px;
- }
- .comment-box h3{
- text-align: left;
- }
- .comment-form input, .comment-form textarea{
- width: 100%;
- padding: 10px;
- margin: 15px 0;
- box-sizing: border-box;
- border: none;
- outline: none;
- background: #f0f0f0;
- }
- .comment-form button{
- margin: 10px 0;
- }
-
- .location{

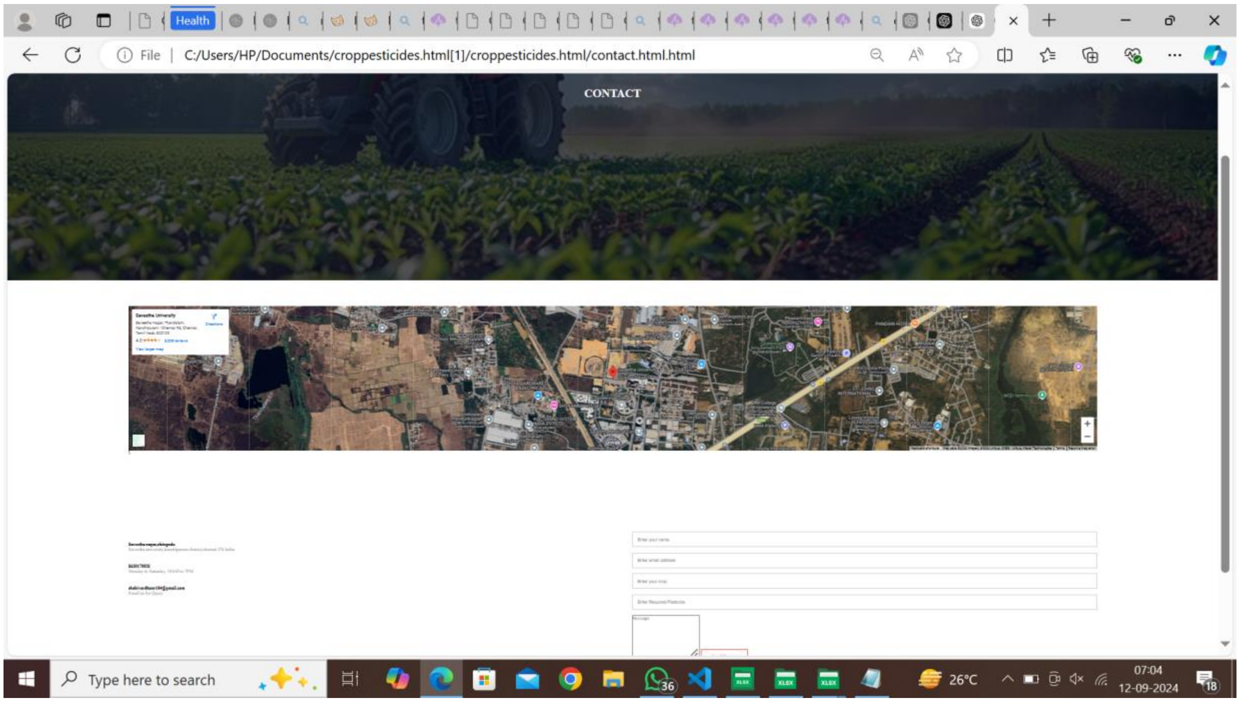
- width: 80%;
- margin: auto;
- padding: 80px 0;
- }
- .location iframe{
- width: 100%;
- }
- .contact-us{
- width: 80%;
- margin: auto;
- }
- .contact-col{
- flex-basis: 48%;
- margin-bottom: 30px;
- }
- .conatct-col div{
- display: flex;
- align-items: center;
- margin-bottom: 40px;
- }
- .contact-col div .fa{
- font-size: 28px;
- color: #f44336;
- margin: 10px;
- margin-right: 30px;
- }
- .contact-col div p{
- padding: 0;

- }
- .contact-col div hs{
- font-size: 20px;
- margin-bottom: 5px;
- color: #555;
- font-weight:400;
- }
- .contact-col input, .contact-col teatarea{
- width: 100%;
- padding: 15px;
- margin-bottom: 17px;
- outline: none;
- border: 1px solid #ccc;
- box-sizing: border-box;
- }

OUTPUT


C:/Users/HP/Documents/croppesticides.html[1]/croppesticides.html/index.html.html
HOME
ABOUT US
CROPS
PESTICIDES
CONTACT
BEST CROP PESTICIDES
It is used to eliminate or control a variety of agricultural pests that can damage crops and livestock and reduce farm productivity. The most commonly applied pesticides are insecticides to kill insects, herbicides to kill weeds, rodenticides to kill rodents, and fungicides to control fungi, mould, and mildew.
Visit Us To Know More
Type here to search
07:02
12-09-2024


C:/Users/HP/Documents/croppesticides.html[1]/croppesticides.html/crop.html.html
HOME
ABOUT US
CROPS
PESTICIDES
CONTACT
CROPS
Different Types of Crops
Tomato, Wheat, Corn, Paddy, Groundnut
TOMATO
WHEAT
CORN
PADDY
Type here to search
26°C
07:03
12-09-2024



Conclusion

The management of pests in agriculture remains a crucial challenge for sustaining global food production and ensuring environmental health. This project has explored the various types of pesticides—chemical, organic, and biological—and highlighted their respective strengths and limitations. While chemical pesticides offer high efficacy and immediate results, their environmental and health risks are significant, and the growing issue of pesticide resistance further complicates their use.

Organic pesticides provide a more environmentally friendly alternative, but their cost and lower effectiveness in certain situations limit their widespread adoption. Biological pesticides offer promising solutions with minimal ecological impact, though their slower action and specificity to certain pests can be a drawback.

Integrated Pest Management (IPM) emerges as the most holistic and sustainable approach, combining the benefits of all pesticide types while reducing the reliance on chemicals. IPM practices promote long-term agricultural sustainability by balancing pest control with environmental preservation.

REFERENCES:

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