

PREVALENCE, DISTRIBUTION AND POTENTIAL HORIZONTAL GENE TRANSFER OF ANTIBIOTIC-RESISTANCE GENETIC DETERMINANTS AMONG PLANT-ASSOCIATED BACTERIA.

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INTRODUCTION

Each year, plantpathogenic bacteria cause devastating crop losses worldwide. Often, farmers must resort to antibiotics to combat these diseases, despite the potentially threatening impact of antibiotic resistance genes (ARGs) on human and animal health. Therefore, there is an urgent need to re-evaluate the current use of antibiotics in plant agriculture. The prevalence and distribution of ARGs among plant pathogenic bacteria, as well as the contribution of Mobile Genetic Elements (MGEs) to their spread, need to be investigated. The question of whether they have an impact on the global issue of antibiotic resistance also remains unanswered. As part of a project commissioned by EFSA (European Food Safety Authority), this work will aim to shed new light on the main uncertainties associated with the use of antibiotics in plant agriculture.

METHODOLOGY

The project will review and analyse in detail the scientific literature on antibiotic resistances in plant pathogenic bacteria, including by conducting a thorough investigation of their potential transfer to environmental bacteria or human pathogens. Grey and technical literature, as well as patents related to AMR (antimicrobial resistance) in plant pathogens, will also be an important focus of this project. Several relevant databases have been selected in order to identify AMRs in plant pathogenic bacteria. A systematic approach will ensure the reliability of the collected data.

RESULTS

Initial investigations indicate that streptomycin and oxytetracycline are the two main antibiotics used in plant disease control. Resistance genes to both antibiotics have been observed in phytopathogens, which raises questions about their safety since they are clinically relevant. Other resistances have also been reported, such as kasugamycin and oxolinic acid resistances. It is unclear however if these resistances have emerged through prolonged use in crop cultivation.

DISCUSSION

The legislation and monitoring of antibiotic use in plant agriculture vary greatly depending on the country. Due to the severity of the potential risks associated with the misuse of antibiotics in this field, it is essential to establish proper legislation and recommendations. This project hopes to raise awareness about this issue and to facilitate decision-making regarding disease control measures.