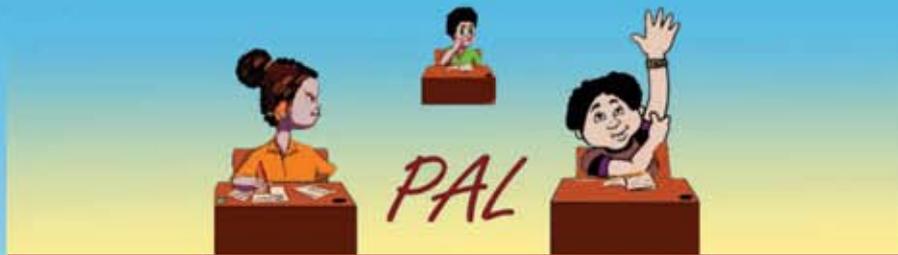


Participate and Learn



Biotechnology Tools for Conservation and Use of Plants A school play for senior students



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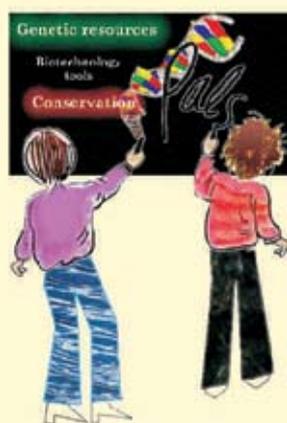
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Preface

With the droughts and other natural disasters in the African continent, which adversely affect agricultural production, people often struggle to survive. Droughts have caused hunger problems in Africa and malnutrition is widespread, even during times when growing conditions are good. Experts argue that ploughing up yet more wilderness, cutting down forests or increasing the area of land under agriculture is no longer a viable option to solve food production problems. To conserve the present ecosystems, increased food production must be limited to the cropland currently in use. Therefore, new ways to increase food production from existing resources need to be applied.

An extension of traditional plant breeding, plant biotechnology, uses genetic knowledge and scientific techniques to add specific traits to crops. These traits benefit farmers, including those in developing countries where crop losses due to weeds, pests and diseases are high and conventional tools to overcome these problems are unavailable or unaffordable. It is now argued that biotechnology is by default our best and, maybe, only way to increase production to meet future food needs.

With the increasing importance of biotechnology, especially in developing countries, educating young students, who will become the decision makers of the future, is a key factor in spreading knowledge about use of biotechnology.

The Food and Agriculture Organization of the United Nations (FAO) is the leader of international efforts to defeat hunger. Achieving food security for all is at the heart of FAO's efforts - to make sure people have regular access to enough high-quality food to lead active, healthy lives.

Through this book, and in line with its mandate to provide information to raise the levels of nutrition, improve agricultural productivity, better the lives of rural populations and contribute to the growth of the world economy, FAO is helping young generations to understand the concept of conservation and how knowledge of biotechnology can help conserve genetic resources. In addition, this book invests in the introduction of methods of conservation to youth at an early stage of their education. This is in line with the International Treaty on Plant Genetic Resources for Food and Agriculture whose objectives are the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising out of their use for sustainable agriculture and food security.

This book is an elementary introduction of a complex subject to encourage students to learn further about biotechnology for the future. The knowledge in this book is presented in the form of a play. This knowledge is intended to help students in their decision making process during their higher education.

It is hoped that this book will be both entertaining and educational.

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Biotechnology Tools for Conservation and Use of Plants

About the book

This book, with script, graphics and photographs, is written as a “play” for high school students aged 15 to 16 years. It is intended to introduce students to the term “biotechnology” and to inform them about the role of biotechnology tools in the conservation and use of plant genetic resources (PGR). The play encourages active participation of students by adding a touch of entertainment to scientific content. Besides the term “biotechnology”, the play also introduces the concept of “conservation” and the logic behind it. In particular, it is expected to educate students in understanding the fundamentals associated with biotechnology and to explain how biotechnology can contribute to the process of conserving plant genetic resources. The cassava plant, which is a major staple food in Africa, is used as an example, whenever possible. The first few examples of biotechnology tools discussed in the book are the plant tissue culture technique, micropropagation, cryopreservation and the techniques associated with marker-assisted selection.



I hope, this plant will be healthy

By the end of this play, students are expected to have gained enough knowledge to confidently discuss “biotechnology” and “conservation” with their teachers and friends. This play is also intended to create interest in young minds to encourage them to learn more about applying biotechnology tools towards conserving existing natural resources.

How to use this book

Information for the teacher & the students

There are many characters in this play. It is recommended that the teacher plays the part of "biology teacher" as well as that of "Dr. Mardea". All other characters should be assigned to students.

There are limited numbers of "student" characters. Therefore, students in the class may have to share the parts of the "student" characters. Each student may play a character in one scene and give the opportunity to play the same character in the following scene to another student. This means that a specific character will be played by more than one student before the completion of the play.

Depending on the class size undergoing this exercise, the number of students reading each "student" character needs be previously assigned by the teacher. This will allow every student in the class to take part in this exercise.

In order to provide a smooth transition between the students reading the same character, participants should read their lines at home and try to understand the content before they read their part in the class room. If they do not understand the content then they should contact their teacher and request clarification before their reading session. It is important that the students have a clear knowledge of what they read when they play their role.

Once a student has read/played a character in a particular scene, he/she should listen and follow the same character throughout the play. At the end of the play, the students who read the same character should get together and discuss the role of that character in the play and the interest of that character pertaining to "PGR", "conservation" and "biotechnology tools".

After the completion of the play, each student in the class will be expected, individually or in groups, to demonstrate what he/she has understood regarding "PGR", "conservation" and "biotechnology tools" in any acceptable format such as a poster, drawing, essay, painting, poetry, slide show, presentation or even another play script.



