



PROJECT REPORT ON:

**DELIVERABLE WP3: D3.2; D10: REPORT ON PILOTING OF CURRICULUM
DEVELOPED BY BUILDING CAPACITY IN PLANT BREEDING AND
BIOTECHNOLOGY EDUCATION AND RESEARCH THROUGH PARTNERSHIP
PROGRAM IN AFRICA, MIDDLE EAST AND EUROPE FOR AGRICULTURAL
TRANSFORMATION (BREEDTECH) PROJECT**

Submitted by BREEDTECH Project team

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Executive Summary

The BREEDTECH project, funded by the European Union, aims to strengthen educational programs, by incorporating cutting edge technologies in the ongoing programs, and by developing new curricula at partner institutions in Africa and Middle East. This executive summary provides an overview of the piloting phase, highlighting progresses, challenges, and key takeaways from implementation across partner institutions. Under this deliverables, the major achievements at the partner institutions are; all the partners successfully integrated the revised curriculum components into existing programs and some of them developed new programs in their host institution; enhanced collaboration between academia and industry stakeholders to ensure practical relevance; positive feedback from faculty and students regarding the applicability and comprehensiveness of the curriculum; and development of supplementary learning materials, including digital resources. The piloting phase commenced during the 2025-2026 academic year and has been implemented at all six partner institutions in Africa and Middle East (two each in Kenya, Ethiopia and Palestine). The curricula were designed to bridge theoretical knowledge with practical applications in modern technologies. Each institution tailored the content to fit its academic framework while maintaining core competencies outlined in the BREEDTECH project. However, partners also encountered challenges in terms of implementation speed due to the variations in institution capacity and regulations, effective delivery of new course contents, and limited access to the specialized laboratory. However, all the partners agree on the fact that these challenges have been addressed to suit the needs of the respective institution and country higher education framework while progressing with other deliverables of the project. Partners from Africa and Middle East learnt lessons and received feedback on training and available cutting edge technologies from partners in European countries. In general, the preliminary assessments indicates improved student engagement and better alignment with industry needs, whereas the next phase involves a structured evaluation to measure learning outcomes from the students to ensure continuous curriculum refinement. Overall, the piloting of the curricula under the BREEDTECH project have been largely successful, setting a strong foundation for future adoption. However, continuous support and collaboration among partner institutions will be crucial in ensuring sustainability and scalability of the curriculum improvements.

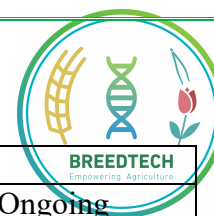


1.0 Introduction

Piloting an academic curriculum involves testing a new curriculum on a small scale before full implementation, allowing for feedback, adjustments, and evaluation of effectiveness, ultimately leading to a more refined and successful curriculum. The piloting phase will provide a valuable opportunity for the universities and students to test and refine the newly developed and reviewed curriculums in line with plant breeding and biotechnology ensuring that it is effective and sustainable. The students will also play an important role during the piloting phase by participating in the classes and providing feedback on the curriculum. This will help to ensure that the curriculum meets their needs and is engaging and relevant to them. During the piloting phase, collaboration between the universities will take place. The universities will collaborate and exchange experiences and best practices during the piloting phase. This will help to ensure the effectiveness and sustainability of the newly developed and reviewed curriculums. Collaboration and lesson learning with experts in EU HEIs to get feedback on the piloting phase and make any necessary changes to the curriculum. On overall, 13 curriculums will be piloted in Kenya, Ethiopia and Palestine (Table 1).

Table 1: Summary of all curriculums/programmes/courses developed by universities engaged in work Package 3 of the BREEDTECH project

	Curriculum name	New/updated/ Reviewed	Institution	Status of piloting
1.	PhD plant Breeding,	Reviewed	Egerton University, Kenya	Ongoing
2.	PhD Biotechnology,	Reviewed	Egerton University, Kenya	Ongoing
3.	Doctor of Philosophy in Crop Protection	Reviewed	Egerton University, Kenya	Ongoing
4.	Doctor of Philosophy in Dryland Agriculture and Resource Management	Reviewed	Egerton University, Kenya	Ongoing
5.	PhD Plant Pathology	New	Laikipia University, Kenya	Ongoing
6.	MSc. Plant Pathology	New	Laikipia University, Kenya	Ongoing
7.	MSc. Molecular Biology and Biotechnology	New	Laikipia University, Kenya	Ongoing
8.	BSc. Molecular Biology and Biotechnology	New	Laikipia University, Kenya	Ongoing
9.	BSc. Dryland Resource Management	Reviewed	Laikipia University, Kenya	Ongoing
10.	MSc in Plant Breeding	Reviewed	Haramaya University, Ehtiopia	Ongoing
11.	MSc in Plant Breeding	New	Oda Bultum University, Ehtiopia	Ongoing
12.	BSc in Plant production and protection	Updated	Al-Quad University,	Ongoing



			Palestine	
13.	BSc in Agriculture Engineering	Updated	Al-Najah National University, Palestine	Ongoing

2.0 Curriculum piloting by BREEDTECH project Universities Cosortium

2.1 Egerton University, Kenya

Four program reviewed are being piloted in 2025/2026 academic year (Table 2). The curriculums were reviewed between March 2024 and November 2024. Each curriculum review teams were led by program leaders and coordinated by the Chair of Crops, Horticulture and Soils department. The curriculums review teams included subject matter specialists, representatives from Board of Undergraduates studies (BUGS), Board of Postgraduate studies (BPGS), and Directorate of Quality Assurance and Expert from Education Curriculum reps Department.

During the curriculum review, the program Self Assessment reports, stakeholder opinion and Faculty expertise and suggestions were incorporated. The reviewed curriculums were presented to the Board of Post Graduate Studie (BPGS) through chair Department of Crops Horticulture and Soils (CHS) and Dean Faculty of Agriculture (FOA) where the reviewed curriculums were approved for teaching in 2024/2025 Academic year as Piloting phase according to BREEDTECH project

Table 2: Programmes reviewed and piloted by Egerton University Kenya under the BREEDTECH project

	Curriculum name	New/updated/Reviewed	Institution	Status of piloting
1	PhD plant Breeding,	Reviewed	Egerton University, Kenya	ongogoing
2	PhD Biotechnology,	Reviewed	Egerton University, Kenya	ongogoing
3	Doctor of Philosophy in Crop Protection	Reviewed	Egerton University, Kenya	ongogoing
4	Doctor of Philosophy in Dryland Agriculture and Resource Management	Reviewed	Egerton University, Kenya	Ongoing

2.2 Laikipia University, Kenya

Four programmes have been developed. These include: PhD Plant Pathology, MSc. Plant Pathology MSc. Molecular Biology and Biotechnology and BSc. Molecular Biology and Biotechnology under the BREEDTECH programme. MSc plant Pathology has been reviewed by Commision for University Education awaiting site inspection and launch in the



2024/2025 academic year, while the rest have gone through the external curriculum review stakeholders workshop and are yet to be discussed by the Deans committee and the Senate.

One programme has been reviewed: BSc Utilization and Sustainability of Arid Lands (USAL) whose name has been changed to **BSc. Dryland Resource Management** from the initial name, and three courses infused inline with the BREEDTECH project. This programme as been passed by the Deans Committee and is to be presented to the Senate, before piloting in the 2025/2026 academic year.

2.3 Haramaya University, Ethiopia

Four new courses have been included in the revised **MSc in Plant Breeding program**, whereas major revision have been made in 3 courses. Four students has been enrolled in the MSc in Plant Breeding program in 2024-2025 session, and are considered as a part of BREEDTECH project for piloting the revised curriculum. However, as the revision of the program is still ongoing and not approved at Senate level, the revised curriculum of Plant Breeding program will be completely implemented from the next academic years i.e. in 2025-2026 session. The curriculum has been reviewed between November 2024 and February 2025 and pending for approval at College and Senate level. The curriculum review teams were led by program leaders and coordinated by the Senior Plant Breeder of the Program. The curriculums review teams included the subject and pedagogue experts. The reviewed curriculum was presented to the School of Plant Sciences.

2.4 Oda Bultum University (OBU), Ethiopia

Oda Bultum University has introduced five new courses in its newly developed MSc in Plant Breeding program, along with major revisions to four existing courses. Three students have enrolled for the 2024–2025 academic year as part of the BREEDTECH project, which aims to pilot the new curriculum. The curriculum was developed between July and December 2024, followed by two review workshops: 1. Internal Curriculum Review Workshop: Involved two senior plant breeders, one pedagogical expert, and one language editor. 2. External Curriculum Review Workshop: Engaged external specialists in plant breeding, plant biotechnology, and bioinformatics.

After receiving approval at the Department of Plant Science and College of Agriculture levels, the curriculum gained final endorsement from the University Senate. The MSc in Plant Breeding program was officially launched on March 1, 2025, with students currently undertaking their first-semester coursework. The Program and Staff Development Directorate led the review process, coordinated by the program’s Senior Plant Breeder, and supported by subject matter experts and pedagogical specialists.



2.5 Al-Quad Open University, Palestine

One new course (Principles of Plant Breeding) has been added as an elective course in BSc in Plant production and Protection program. The aim of this course is learning the genetic and biological backgrounds of breeding. As well, learning the conventional and molecular methods in breeding to apply the breeding principles. Eventually, learning the positive impact of biotechnology application on plant breeding. This course will be piloted in the academic year 2025-2026. The curriculums were reviewed between November 2024 and January 2025 with the help of the subject expert and pedagogue expert.

2.6 An-Najah National University, Palestine:

Two courses (Technology of Crop Improvement and Genetic Engineering) (Table 3) of BSc in Agriculture Engineering were reviewed and upgraded. These courses will be piloted in the academic years 2025-2026 and 2026-2027. The curriculums were reviewed between November 2024 and January 2025. Each curriculum review teams were led by program leaders and coordinated by the Chair of the agricultural engineering department. The curriculums review teams included the subject expert and pedagogue expert.

The reviewed curriculums were presented to the Board of the faculty of veterinary medicine and agricultural engineering.

Table 3: Programmes reviewed and piloted by An-Najah National University, Palestine under the BREEDTECH project

Curriculum (Course name)	New/updated/ Reviewed	Institution	Status of piloting
BSc in Agriculture Engineering (Technology of Crop Improvement)	Updated	An-Najah National University	ongoing
BSc in Agriculture Engineering (Genetic Engineering)	Updated	An-Najah National University	ongoing

3.0 Conclusion

In conclusion BREEDTECH project is piloting 13 curriculums in Africa specifically in Kenya and Ethiopia and in Palestine. This is a great achievement in achieving the project goals towards building the capacity in plant breeding and biotechnology education and research in Africa, the Middle East and Europe. This will be towards building a research movement related to plant breeding and biotechnology in Europe and to encourage researchers and academics. These curriculums once piloted will improve the skills and competences levels of students and academic staff of partner African and Palestinian universities ensuring that the next generation of plant breeders and biotechnology professionals are equipped with the necessary knowledge and skills to succeed in their careers.