



**AGENT-BASED
SUPPORT TOOL FOR
THE DEVELOPMENT
OF AGRICULTURE POLICIES**

D4.7 Report on testing and validation activities of the AGRICORE interface



Deliverable Number	D4.7
Lead Beneficiary	AAT
Authors	AAT, IDE
Work package	WP4
Delivery Date	M39
Dissemination Level	Public

www.agricore-project.eu



The Agricore project has received funding from the European Union's Horizon 2020 research and innovation programme under the Grant Agreement No. 816078





Document Information

Project title	Agent-based support tool for the development of agriculture policies
Project acronym	AGRICORE
Project call	H2020-RUR-04-2018-2019
Grant number	816078
Project duration	1.09.2019-31.8.2023 (48 months)

Version History

Version	Description	Organisation	Date
0.1	ToC definition	AAT	25-ene-2023
0.2	Content inclusion (first draft)	AAT	01-feb-2023
0.3	Revision and comments	IDE	07-feb-2023
0.4	Second draft	AAT/IDE	14-feb-2023
1.0	Final version (exportation and formatting)	IDE	27-feb-2023

Disclaimer

All the contributors to this deliverable declare that they:

- Are aware that plagiarism and/or literal utilisation (copy) of materials and texts from other Projects, works and deliverables must be avoided and may be subject to disciplinary actions against the related partners and/or the Project consortium by the EU.
- Confirm that all their individual contributions to this deliverable are genuine and their own work or the work of their teams working in the Project, except where is explicitly indicated otherwise.
- Have followed the required conventions in referencing the thoughts, ideas and texts made outside the Project.

Executive Summary

AGRICORE is a research project funded by the European Commission under the RUR-04-2018 call, part of the H2020 programme, which proposes an innovative way to apply agent-based modelling to improve the capacity of policymakers to evaluate the impact of agricultural-related measurements under and outside the framework of the Common Agricultural Policy (CAP).

Within the AGRICORE suite of tools, its main graphical user interface (GUI) can be found. Developed as a cross-platform desktop application, this tool enables users to configure and launch simulations on agricultural policies using synthetic populations and the Agent-based model (ABM). In such simulations, the analysis of the effect of the different policy measures is carried out through the computation of a series of key performance indicators (KPIs). Once finished the simulations, these KPIs will be used to assist in the analysis and visualisation of the results, representing them graphically in interactive charts and maps that will help users and policymakers to draw conclusions and support decision-making processes.

This document presents the design, description and execution of the testing and validation activities carried out to verify the performance of the AGRICORE interface and its interaction with the modules. The tests have been defined based on the functional requirements described in D4.6. The resulting test plan consists of four phases described in sections 5 to 8: unit tests, Integration tests, functional testing and UAT testing. Each of these phases has several test cases, which are described in detail and whose results are exposed in their corresponding sections in table format. It is necessary to remark that all test cases proposed and carried out were successfully approved.

Abbreviations

Abbreviation	Full name
ABM	Agent-Based Model
ARDIT	Agricultural Research Data Index Tool
CAP	Common Agricultural Policy
DWH	Data Warehouse
FR	Functional Requirement
KPI	Key Performance Indicator
NFR	Non-Functional Requirement
SQL	Structured Query Language
WP	Work Package
SPG	Synthetic population generation
GUI	Graphical user interface

List of Figures

Figure 1. AGRICORE Modular Architecture.....	9
Figure 2. Summarised Workflow.....	9

List of Tables

Table 1. Functional requirements of the AGRICORE interface module.....	10
Table 2. Description of UTP-TC-01-001: User Registration.....	14
Table 3. Description of UTP-TC-02-001: Login in the application with bad credentials.....	14
Table 4. Description of UTP-TC-02-002: Login in the application with the correct credentials.....	14
Table 5. Description of UTP-TC-02-003: Login in the application with an advanced user role.....	15
Table 6. Description of UTP-TC-03-001: Recover account credentials.....	15
Table 7. Description of UTP-TC-04-001: Create a new private policy.....	16
Table 8. Description of UTP-TC-04-002: Search for private policies.....	16
Table 9. Description of UTP-TC-05-001: Create a new general policy.....	16
Table 10. Description of UTP-TC-05-002: Search for general policies.....	17
Table 11. Description of UTP-TC-06-001: Access to the Synthetic population configuration view.....	17
Table 12. Description of UTP-TC-06-002: Load Synthetic population definition.....	17
Table 13. Description of UTP-TC-07-001: Access to the simulation setup page.....	18
Table 14. Description of UTP-TC-08-001: Searching for populations from available repositories.....	18
Table 15. Description of UTP-TC-08-002: Load synthetic population from a file to use it in the simulation setup.....	18
Table 16. Description of UTP-TC-09-001: Selection of Private Policies to be included in the simulation.....	19
Table 17. Description of UTP-TC-09-002: Selection of General Policies to be included in the simulation.....	19
Table 18. Description of UTP-TC-10-001: Selection of Simulation Period.....	20
Table 19. Description of UTP-TC-11-001: Selection of Solver and Biophysical Model(s).....	20
Table 20. Description of UTP-TC-12-001: Selection of default KPIs to be computed.....	20
Table 21. Description of UTP-TC-13-001: Export simulation setup file.....	21
Table 22. Description of UTP-TC-14-001: Load a simulation setup file.....	21
Table 23. Description of UTP-TC-15-001: Try to run the simulation.....	21
Table 24. Description of UTP-TC-16-001: View ongoing simulations.....	22
Table 25. Description of UTP-TC-17-001: View finished simulations.....	22
Table 26. Description of UTP-TC-18-001: Visualise the results from a finished simulation launched from the app.....	23
Table 27. Description of UTP-TC-18-002: Visualise the results from a finished simulation imported from a file.....	23
Table 28. Description of UTP-TC-18-002: Download a simulation result in PDF format.....	23
Table 29. Description of UTP-TC-19-001: Access to the main page and established navigations.....	24
Table 30. Traceability matrix of the unit tests.....	24
Table 31. Test report of the unit tests.....	26
Table 32. Description of ITP-TC-01-001: Check connection status to external modules.....	28
Table 33. Description of ITP-TC-02-001: New user registration.....	28
Table 34. Description of ITP-TC-02-002: Registered user authentication.....	29
Table 35. Description of ITP-TC-02-003: Authentication and authorization of user with an advanced role.....	29
Table 36. Description of ITP-TC-02-004: Setting new password.....	29

Table 37. Description of ITP-TC-03-001: Verify access to ARDIT from the Agricore Interface application.	30
Table 38. Description of ITP-TC-04-001: Selecting a population repository by consulting the DWH.....	30
Table 39. Description of ITP-TC-05-001: Loading and processing of the population file in the Agricore interface.....	30
Table 40. Description of ITP-TC-06-001: Query Solvers and Biophysical models.....	31
Table 41. Description of ITP-TC-07-001: Query the general catalogue of policies.....	31
Table 42. Description of ITP-TC-07-002: Create a new policy in the general catalogue.....	31
Table 43. Description of ITP-TC-07-003: Modifying a policy in the general catalogue of policies.....	32
Table 44. Description of ITP-TC-07-004: Deleting a policy in the general catalogue of policies.....	32
Table 45. Description of ITP-TC-08-001: Query of KPIS without prior establishment of policy.....	33
Table 46. Description of ITP-TC-08-002: KPIS query previously establishing a general catalogue policy.....	33
Table 47. Description of ITP-TC-09-001: Launch a simulation previously selecting all the necessary elements.....	33
Table 48. Description of ITP-TC-10-001: List all simulations in progress.....	34
Table 49. Description of ITP-TC-10-002: View the status of a simulation in progress.....	34
Table 50. Description of ITP-TC-10-003: Pause simulation process.....	35
Table 51. Description of ITP-TC-10-004: Stop the simulation process.....	35
Table 52. Description of ITP-TC-11-001: Visualise the results from a finished simulation launched from the app and store in DWH.....	35
Table 53. Traceability matrix of integrated testing.....	36
Table 54. Test report of the integrated testing.....	37
Table 55. Description of FTP-TC-01-001: Login in the application.....	38
Table 56. Description of FTP-TC-01-002: User Registration.....	39
Table 57. Description of FTP-TC-01-003: Recover account credentials.....	39
Table 58. Description of FTP-TC-02-001: Behavior of the SSP (Simulation Setup Page) view.....	39
Table 59. Description of FTP-TC-02-002: Synthetic population selection from a repository.....	40
Table 60. Description of FTP-TC-02-003: Load synthetic population from a file.....	40
Table 61. Description of FTP-TC-02-004: Selection of Policies to be included in the simulation.....	41
Table 62. Description of FTP-TC-02-005: Selection of Simulation Period.....	41
Table 63. Description of FTP-TC-02-006: Selection of Solver and Biophysical Model(s).....	42
Table 64. Description of FTP-TC-02-007: Selection of default KPIs to be computed.....	42
Table 65. Description of FTP-TC-03-001: View ongoing simulations.....	42
Table 66. Description of FTP-TC-03-002: View finished simulations.....	43
Table 67. Description of FTP-TC-03-003: Visualise the results from a finished simulation launched from the app.....	43
Table 68. Description of FTP-TC-03-004: Visualise the results from a finished simulation imported from a file.....	44
Table 69. Description of FTP-TC-03-005: Download a simulation result in PDF format.....	44
Table 70. Description of FTP-TC-03-006: Attempted creation of a custom visualization by an advanced user.....	44
Table 71. Description of FTP-TC-04-001: Access to the Synthetic population configuration view.....	45
Table 72. Description of FTP-TC-04-002: Load Synthetic population definition.....	45
Table 73. Description of FTP-TC-05-001: Access to the main page and established navigations.....	46
Table 74. Traceability matrix of the functional testing.....	46
Table 75. Test report of the functional testing.....	47
Table 76. Description of UAT-TC-01-001: User Registration.....	49
Table 77. Description of UAT-TC-01-002: Login in the application.....	49
Table 78. Description of UAT-TC-01-003: Recover account credentials.....	49
Table 79. Description of UAT-TC-02-001: Access to the main page and established navigations.....	50
Table 80. Description of UAT-TC-03-001: Synthetic population selection from a repository.....	50
Table 81. Description of UAT-TC-03-002: Selection of Policies to be included in the simulation.....	51
Table 82. Description of UAT-TC-03-003: Selection of Simulation Period.....	51

Table 83. Description of UAT-TC-03-004: Selection of Solver and Biophysical Model(s).	51
Table 84. Description of UAT-TC-03-005: Selection of KPIs to be computed.	52
Table 85. Description of UAT-TC-03-005: Launch simulation.	52
Table 86. Description of UAT-TC-04-001: View ongoing simulations.....	52
Table 87. Description of UAT-TC-04-002: Refresh ongoing simulations progress.....	53
Table 88. Description of UAT-TC-04-003: View finished simulations.....	53
Table 89. Description of UAT-TC-04-004: View detailed results for a finished simulation.	54
Table 90. Description of UAT-TC-04-005: Download a simulation result in PDF format.	54
Table 91. Traceability matrix of the UAT testing.	54
Table 92. Test report of the UAT testing.....	55

Table of Contents

1	Introduction	9
1.1	Objectives.....	9
1.2	Context.....	9
2	Functional Requirements	10
3	Approvers team.....	11
4	Test strategy.....	12
5	Unit testing.....	13
5.1	Prerequisites for the execution of the plan.....	13
5.2	Preparation and validation of the test environment.....	13
5.3	Participants.....	13
5.4	Description of scenarios.....	13
5.5	Test cases.....	14
5.6	Traceability Matrix	24
5.7	Test report.....	26
6	Integrated testing.....	27
6.1	Prerequisites for the execution of the plan.....	27
6.2	Preparation and validation of the test environment.....	27
6.3	Participants.....	27
6.4	Description of scenarios.....	27
6.5	Test cases.....	28
6.6	Traceability Matrix	36
6.7	Test report.....	37
7	Functional testing.....	38
7.1	Prerequisites for the execution of the plan.....	38
7.2	Preparation and validation of the test environment.....	38
7.3	Participants.....	38
7.4	Description of scenarios.....	38
7.5	Test cases.....	38
7.6	Traceability Matrix	46
7.7	Test report.....	47
8	UAT testing.....	48
8.1	Prerequisites for the execution of the plan.....	48
8.2	Preparation and validation of the test environment.....	48
8.3	Participants.....	48
8.4	Description of scenarios.....	48
8.5	Test cases.....	48
8.6	Traceability Matrix	54
8.7	Test report.....	55

1 Introduction

This document contains the different test plans prepared by the Agricore Interface platform development team, as well as a detailed description of each test plan and results obtained to establish the validation of the platform.

1.1 Objectives

The objective of this document is to present the different test plans for the Agricore Interface module and serve as a base for the validation and approval of the different tests carried out.

1.2 Context

AGRICORE Interface Module is the set of screens, controls and mechanisms for inputting and loading information and visualising the results of simulations carried out. All these modules allow the user to interact with the rest of the software components that make up the AGRICORE suite, as can be observed in [Figure 1](#). These modules are integrated and communicate according to this scheme, interacting according to the steps in [Figure 2](#) to simulate the scenario described by the user through the user interface.

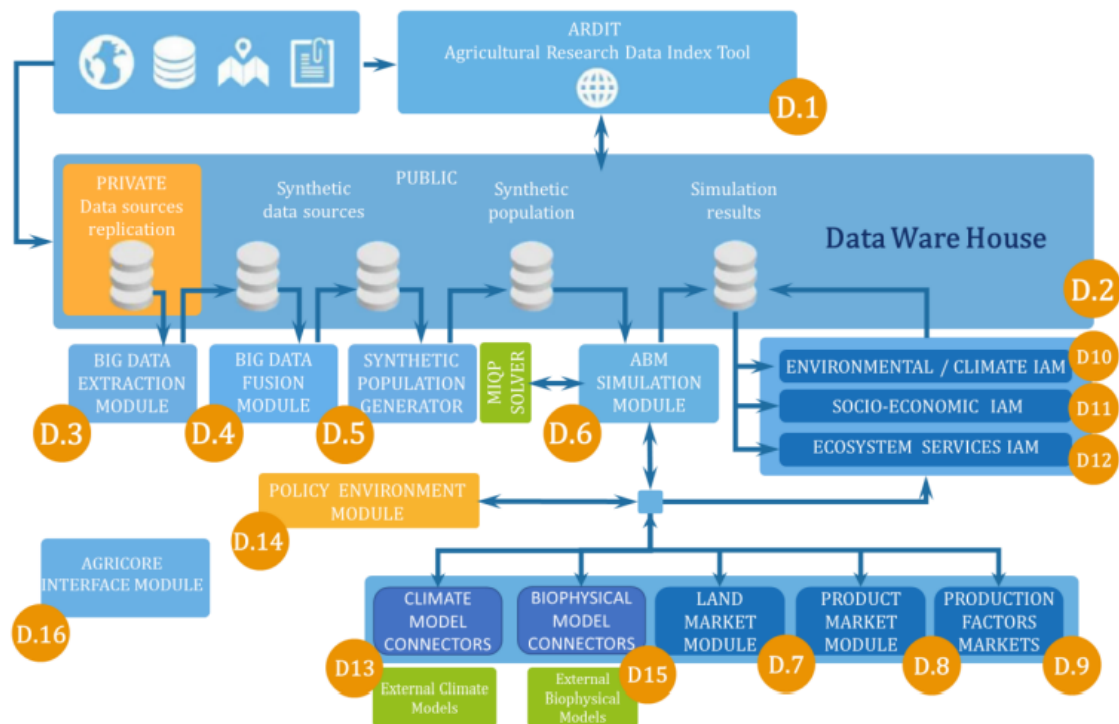


Figure 1. AGRICORE Modular Architecture.

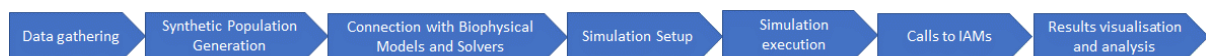


Figure 2. Summarised Workflow.

2 Functional Requirements

The functional requirements defined for the development of the AGRICORE interface module were listed and described in detail in D4.6. [Table 1](#) gathers them, together with their priority level, which is ML (medium-high) for all of them, and their status after testing. One or more test cases will be associated with each of them to verify their correct status.

Table 1. Functional requirements of the AGRICORE interface module.

Module	Code	Title	Priority	Status
AG.D16	AG.D16.FR.001	Centralise the interaction of the users with the AGRICORE suite	MH	Approved
AG.D16	AG.D16.FR.001-1-1	Login in the AGRICORE-Interface	MH	Approved
AG.D16	AG.D16.FR.001-1-2	User Registration	MH	Approved
AG.D16	AG.D16.FR.001-1-3	Recover account credentials	MH	Approved
AG.D16	AG.D16.FR.001-2	Simulation Setup	MH	Approved
AG.D16	AG.D16.FR.001-2-1	Simulation Setup Page	MH	Approved
AG.D16	AG.D16.FR.001-2-2	Synthetic Population Selection	MH	Approved
AG.D16	AG.D16.FR.001-2-3	Selection of Policies to be included in the simulation	MH	Approved
AG.D16	AG.D16.FR.001-2-4	Selection of Simulation Period	MH	Approved
AG.D16	AG.D16.FR.001-2-5	Selection of Solver and Biophysical Model(s) for the Simulation	MH	Approved
AG.D16	AG.D16.FR.001-2-6	Selection of default KPIs to be computed	MH	Approved
AG.D16	AG.D16.FR.001-3	My Simulations Module	MH	Approved
AG.D16	AG.D16.FR.001-4	Visualisation Module	MH	Approved
AG.D16	AG.D16.FR.001-5	Synthetic Population Generator Module	MH	Approved
AG.D16	AG.D16.FR.001-5-1	Synthetic Population Generator Configurator	MH	Approved
AG.D16	AG.D16.FR.001-5-2	Selection of Datasources for SPG	MH	Approved
AG.D16	AG.D16.FR.001-5-3	Synthetic Population Generator (Down)Loader	MH	Approved
AG.D16	AG.D16.FR.001-6	AGRICORE Suite Main Page	MH	Approved

3 Approvers team

The team of approvers will be made up of the project leaders:

Approver	Role	Company	Email
Carlos Leyva Guerrero	Technical leader	Idener	carlos.leyva@idener.es

4 Test strategy

In this section, how the testing phase has been organised is described. This plan aims at providing a feasible and comprehensive testing process for the module. The following test plans will be considered:

- Unit tests
- Integration tests between systems
- Functional testing
- UAT testing

The following sections are focused on one of these test plans. For each proposed test plan, the following information is included in order to record the circumstances in which the tests described are carried out:

- **Prerequisites for the execution of the plan:** the set of prerequisites that must be met to give way to the execution of the test plan.
- **Preparation and validation of the test environment:** preparation of the environment that will be used for these tests together with a set of validations that will be necessary to carry out before executing the described tests to guarantee the correct functioning of the environment and its origin with the execution of the test plan.
- **Participants:** teams participating in the execution of the test plan.
- **Description of scenarios:** description of all the scenarios that are going to be tested within the test plan.
- **Test cases:** description of all test cases specifying (for each case):
 - Identification of the test case
 - Test case title
 - Test scenario identification
 - Test scenario title
 - Type of test
 - Test Summary
 - Test case prerequisites
 - Steps to test
 - Expected result.
 - Requirements covered by the test case.
- **Traceability Matrix:** traceability matrix to establish coverage between requirements and proposed test cases.
- **Test report:** test report with the summary of the iterations carried out for each plan: Iteration number, Test cases in error, Test cases without error, Untested Test Cases, and Observations.

5 Unit testing

5.1 Prerequisites for the execution of the plan

For the execution of unit tests, it is necessary that the functional module to be tested is completely built and assembled.

5.2 Preparation and validation of the test environment

For the execution of these tests, it is not necessary that the application is completely built, but the module to be tested according to the description of the different scenarios does. You must have access to the release of the application that contains the built module to validate.

5.3 Participants

Agricore interface development team.

5.4 Description of scenarios

The scenarios to be tested have been structured as follows:

- SC-01: User registration
- SC-02: Login in the application
- SC-03: Recovery of access credentials
- SC-04: My catalogue of policies
- SC-05: General catalogue of policies
- SC-06: Synthetic Population Generator Module
- SC-07: Simulation setup view
- SC-08: Simulation setup – Select a synthetic population
- SC-09: Simulation setup – Select policies
- SC-10: Simulation setup – Select simulation horizon
- SC-11: Simulation setup – Selection of solver and biophysical models
- SC-12: Simulation setup – Selection of KPIs
- SC-13: Simulation setup – Export configuration
- SC-14: Simulation setup – Import configuration
- SC-15: Simulation setup – Launch simulation
- SC-16: My simulations – Simulations in progress
- SC-17: My simulations – Finished simulations
- SC-18: Visualization Module

- SC-19: AGRICORE Suite Main Page

5.5 Test cases

The different test cases proposed by each scenario are described below.

Table 2. Description of UTP-TC-01-001: User Registration.

UTP-TC-01-001: User Registration	
Scenario ID	SC-01
Scenario Title	User registration
Type of Test	UNIT
Summary	Check the registration process on the agricore interface platform
Prerequisites	Have access to the agricore interface application
Steps	<ol style="list-style-type: none"> 1. The user opens the desktop application agricore interface 2. The user clicks on the link indicating that he does not have an account and wishes to register. 3. The user fills in the required fields in the registration form that appears and submits the data.
Expected results	After completing the registration process by entering the required data: Name, country, valid email and affiliation data (company and/or institution) and accepting the receipt of emails, the creation of the account is confirmed. Repeat test case 01-001 to confirm that the user can access the platform.
Requirements covered by the test case	AG.D16.FR.001-1-2

Table 3. Description of UTP-TC-02-001: Login in the application with bad credentials.

UTP-TC-02-001: Login in the application with bad credentials	
Scenario ID	SC-02
Scenario Title	Login in the application
Type of Test	UNIT
Summary	Check system behaviour when incorrect credentials are entered.
Prerequisites	Have access to the agricore interface application
Steps	<ol style="list-style-type: none"> 1. The user opens the desktop application agricore interface 2. The user tries to access the application from the login page with bad credentials.
Expected results	After trying to log in with incorrect credentials, it is verified that the application responds indicating that the user or the password entered is incorrect and allows the user to re-enter other credentials.
Requirements covered by the test case	AG.D16.FR.001-1-1

Table 4. Description of UTP-TC-02-002: Login in the application with the correct credentials.

UTP-TC-02-002: Login in the application with the correct credentials	
Scenario ID	SC-02
Scenario Title	Login in the application
Type of Test	UNIT

Summary	Check that registered users with correct credentials can access the application and the authentication process against the established user repository is carried out correctly.
Prerequisites	Have access to the application and the correct credentials to access it.
Steps	1. The user opens the desktop application agricore interface 2. The user tries to access the application from the login page with the correct credentials.
Expected results	After entering the correct credentials, it is verified that the user can access the application, and the initial page configured for his access level is shown.
Requirements covered by the test case	AG.D16.FR.001-1-1

Table 5. Description of UTP-TC-02-003: Login in the application with an advanced user role.

UTP-TC-02-003: Login in the application with an advanced user role	
Scenario ID	SC-02
Scenario Title	Login in the application
Type of Test	UNIT
Summary	Check correct advanced user access to the application
Prerequisites	Have access to the application and user credentials with an advanced access level
Steps	1. The user opens the desktop application agricore interface 2. The user tries to access the application with the correct credentials of a user with an advanced role.
Expected results	After accessing the application, it is verified that the menu options reserved for advanced users appear available.
Requirements covered by the test case	AG.D16.FR.001-1-1

Table 6. Description of UTP-TC-03-001: Recover account credentials.

UTP-TC-03-001: Recover account credentials	
Scenario ID	SC-03
Scenario Title	Recovery of access credentials
Type of Test	UNIT
Summary	Check that the user can recover their access credentials in case of loss.
Prerequisites	Have a valid account in the application.
Steps	1. The user opens the desktop application agricore interface 2. The user clicks on the link indicating that he has forgotten his password. 3. The user fills in the required fields (email) and clicks on the Recover password button.
Expected results	After clicking on the password loss link and entering your registration email, an email will be sent to the user from which you can reset your password to access the agricore interface platform.
Requirements covered by the test case	AG.D16.FR.001-1-3

Table 7. Description of UTP-TC-04-001: Create a new private policy.

UTP-TC-04-001: Create a new private policy	
Scenario ID	SC-04
Scenario Title	My catalogue of policies
Type of Test	UNIT
Summary	Creation of a private policy for inclusion in the private catalogue.
Prerequisites	Have access to the application and sufficient privileges to create a new policy in the private catalogue.
Steps	<ol style="list-style-type: none"> 1. Access the menu option My catalogue of policies. 2. Click on the "Create new policy" button. 3. Fill in the creation form with the required data and send it.
Expected results	After filling in all the necessary fields of the form, the user creates a new policy in his private catalogue.
Requirements covered by the test case	AG.D16.FR.001-2-3

Table 8. Description of UTP-TC-04-002: Search for private policies.

UTP-TC-04-002: Search for private policies	
Scenario ID	SC-04
Scenario Title	My catalogue of policies
Type of Test	UNIT
Summary	Performing a search for user-defined policies in his private catalogue.
Prerequisites	Have some previously defined policies in the catalogue to be able to carry out the search.
Steps	<ol style="list-style-type: none"> 1. Access the menu option My catalogue of policies. 2. A list with the policies defined in the private catalogue will appear.
Expected results	After performing the search, the policies defined in the list are displayed. Try to find the policy defined in the previous case and try to interact with the listing pagination.
Requirements covered by the test case	AG.D16.FR.001-2-3

Table 9. Description of UTP-TC-05-001: Create a new general policy.

UTP-TC-05-001: Create a new general policy	
Scenario ID	SC-05
Scenario Title	General catalogue of policies
Type of Test	UNIT
Summary	Creation of a general policy for inclusion in the general catalogue.
Prerequisites	Have access to the application and sufficient privileges to create a new policy in the general catalogue.
Steps	<ol style="list-style-type: none"> 1. Access the menu option General catalogue of policies. 2. Click on the "Create new policy" button. 3. Fill in the creation form with the required data and send it.
Expected results	After filling in all the necessary fields of the form, the user creates a new policy in the general catalogue.
Requirements covered by the test case	AG.D16.FR.001-2-3

Table 10. Description of UTP-TC-05-002: Search for general policies.

UTP-TC-05-002: Search for general policies	
Scenario ID	SC-05
Scenario Title	General catalogue of policies
Type of Test	UNIT
Summary	Search for policies defined in the general catalogue.
Prerequisites	Have access to the application and sufficient privileges to perform policy searches in the general catalogue.
Steps	<ol style="list-style-type: none"> 1. Access the menu option General catalogue of policies. 2. A list of the policies defined in the general catalogue will appear.
Expected results	After accessing the general policies view, it is verified that the policies defined in the general catalogue are listed.
Requirements covered by the test case	AG.D16.FR.001-2-3

Table 11. Description of UTP-TC-06-001: Access to the Synthetic population configuration view.

UTP-TC-06-001: Access to the Synthetic population configuration view	
Scenario ID	SC-06
Scenario Title	Synthetic Population Generator Module
Type of Test	UNIT
Summary	It will be verified that an advanced user has access to the Synthetic population generator view and has data loaded in order to start a sample configuration.
Prerequisites	Have access credentials in advanced user mode and have data loaded on the platform to be able to start an example of the generation/configuration of a Synthetic population.
Steps	<ol style="list-style-type: none"> 1. Access the menu option Synthetic populations. 2. Click on the button to create a new Synthetic population.
Expected results	It is verified that the advanced user can access the Synthetic population generator module and has data loaded in the selection fields to start a sample generation.
Requirements covered by the test case	AG.D16.FR.001-5

Table 12. Description of UTP-TC-06-002: Load Synthetic population definition.

UTP-TC-06-002: Load Synthetic population definition	
Scenario ID	SC-06
Scenario Title	Synthetic Population Generator Module
Type of Test	UNIT
Summary	It will be verified that the advanced user can load a file with the definition of a synthetic population from his computer to incorporate it in the simulation configuration.
Prerequisites	Have access credentials in advanced user mode and have a file with the format required for the definition of a synthetic population.
Steps	<ol style="list-style-type: none"> 1. Access the menu option Synthetic populations. 2. Click on the button to create a new Synthetic population. 3. Click on the upload button to upload the previous definition of the population contained in a format file.

Expected results	The advanced user can successfully import the file he has with the definition of the synthetic population to be incorporated into the simulation configuration.
Requirements covered by the test case	AG.D16.FR.001-5-3

Table 13. Description of UTP-TC-07-001: Access to the simulation setup page.

UTP-TC-07-001: Access to the simulation setup page	
Scenario ID	SC-07
Scenario Title	Simulation Setup view
Type of Test	UNIT
Summary	It will be verified that the user can access the main page from which all the necessary steps are available to define a new simulation and the behaviour of the view in case he leaves this option.
Prerequisites	Access the Simulation Setup page and start to define a new simulation.
Steps	<ol style="list-style-type: none"> 1. Access the menu option Simulation setup. 2. Start to define the first steps of a hypothetical simulation setup. 3. Without finishing the full definition, jump to another application menu option.
Expected results	When the user leaves the simulation setup page without having downloaded the setup file, a message should appear indicating whether to proceed without saving the configuration established up to that moment or to lose the changes.
Requirements covered by the test case	AG.D16.FR.001-2-1

Table 14. Description of UTP-TC-08-001: Searching for populations from available repositories.

UTP-TC-08-001: Searching for populations from available repositories	
Scenario ID	SC-08
Scenario Title	Simulation setup – Select a synthetic population
Type of Test	UNIT
Summary	Check that it is allowed to search for populations in the repositories available from the interface.
Prerequisites	Have access to the application and sufficient privileges to define a simulation setup.
Steps	<ol style="list-style-type: none"> 1. Access the menu option Simulation setup. 2. In the first step, referring to the selection of a synthetic population, try to search among the available repositories.
Expected results	It is verified that for each repository selectable from the "Select a population from the repository" functionality, it is possible to perform a search without population errors and valid results are displayed.
Requirements covered by the test case	AG.D16.FR.001-2-2

Table 15. Description of UTP-TC-08-002: Load synthetic population from a file to use it in the simulation setup.

UTP-TC-08-002: Load synthetic population from a file to use it in the simulation setup	
Scenario ID	SC-08
Scenario Title	Simulation setup – Select a synthetic population

Type of Test	UNIT
Summary	Selection of a previously defined synthetic population from a local file according to the required format to be able to be imported.
Prerequisites	Check that the user can use a local file containing the definition of a synthetic population to incorporate it as part of the configuration in the simulation he is defining.
Steps	<ol style="list-style-type: none"> 1. Access the menu option Simulation setup. 2. In the first step, referring to the selection of a synthetic population, try to load a population from an external file and use it to incorporate it into the simulation setup definition.
Expected results	After loading the file, it is verified that the user can use the synthetic population contained as part of the configuration in the simulation that he is defining.
Requirements covered by the test case	AG.D16.FR.001-2-2

Table 16. Description of UTP-TC-09-001: Selection of Private Policies to be included in the simulation.

UTP-TC-09-001: Selection of Private Policies to be included in the simulation	
Scenario ID	SC-09
Scenario Title	Simulation setup – Select policies
Type of Test	UNIT
Summary	The selection of policies from the private catalogue to be incorporated into the simulation will be verified.
Prerequisites	Have a Policy Description in your personal catalogue (either because they have been incorporated from the general catalogue. or because you have policies described by the user himself).
Steps	<ol style="list-style-type: none"> 1. Access the menu option Simulation setup. 2. Access the second step and try to select a previously private defined policy.
Expected results	After selecting the private policy description to be incorporated into the configuration and downloading the configuration file, it is verified that the policy has been successfully incorporated.
Requirements covered by the test case	AG.D16.FR.001-2-3

Table 17. Description of UTP-TC-09-002: Selection of General Policies to be included in the simulation.

UTP-TC-09-002: Selection of General Policies to be included in the simulation	
Scenario ID	SC-09
Scenario Title	Simulation setup – Select policies
Type of Test	UNIT
Summary	The selection of policies from the general catalogue to be incorporated into the simulation will be verified.
Prerequisites	Have policies defined in the general catalogue.
Steps	<ol style="list-style-type: none"> 1. Access the menu option Simulation setup. 2. Access the second step and try to select a previously general defined policy.
Expected results	After selecting the policy from the general catalogue and incorporating it into the configuration, download the configuration file and check that the specified policy is contained in the simulation configuration being defined.

Requirements covered by the test case	AG.D16.FR.001-2-3
---------------------------------------	-------------------

Table 18. Description of UTP-TC-10-001: Selection of Simulation Period.

UTP-TC-10-001: Selection of Simulation Period	
Scenario ID	SC-10
Scenario Title	Simulation setup – Select the simulation horizon
Type of Test	UNIT
Summary	It will be verified that the user can select the simulation period to incorporate it into the configuration.
Prerequisites	Have access to the local agricore interface platform and have data loaded for period selection.
Steps	<ol style="list-style-type: none"> 1. Access the menu option Simulation setup. 2. Go to the third step and try to select a simulation period.
Expected results	It is verified that the user can select the necessary data to establish the simulation period in the configuration: base year, season, and number of time units to simulate. After selecting these fields and incorporating them into the simulation configuration, download the file to check that these elements have been correctly incorporated into the simulation configuration.
Requirements covered by the test case	AG.D16.FR.001-2-4

Table 19. Description of UTP-TC-11-001: Selection of Solver and Biophysical Model(s).

UTP-TC-11-001: Selection of Solver and Biophysical Model(s)	
Scenario ID	SC-11
Scenario Title	Simulation setup – Selection of solver and biophysical models
Type of Test	UNIT
Summary	It will be verified that the user can select Solver and Biophysical Model elements to incorporate them into the simulation configuration.
Prerequisites	Have access to the local platform and have data loaded for the Solver and Biophysical model selection fields.
Steps	<ol style="list-style-type: none"> 1. Access the menu option Simulation setup. 2. Go to the fourth step and try to select a solver and a biophysical model from the dropdown lists that appear for each item.
Expected results	It is verified that the user can select Solver and Biophysical model elements and incorporate them into the simulation configuration file. To do this, download the configuration file and check that these elements have been added correctly.
Requirements covered by the test case	AG.D16.FR.001-2-5

Table 20. Description of UTP-TC-12-001: Selection of default KPIs to be computed.

UTP-TC-12-001: Selection of default KPIs to be computed	
Scenario ID	SC-12
Scenario Title	Simulation setup – Selection of KPIs
Type of Test	UNIT

Summary	It will be verified that the user can select a set of default KPIs to be incorporated into the simulation process.
Prerequisites	Have access to the local agricore interface platform and have KPIs data available for selection.
Steps	<ol style="list-style-type: none"> 1. Access the menu option Simulation setup. 2. Go to the fifth step and try to select a KPI to incorporate into the definition.
Expected results	After selecting a set of KPIs and incorporating them into the simulation, it is verified that they appear correctly specified in the generated file.
Requirements covered by the test case	AG.D16.FR.001-2-6

Table 21. Description of UTP-TC-13-001: Export simulation setup file.

UTP-TC-13-001: Export simulation setup file	
Scenario ID	SC-13
Scenario Title	Simulation setup - Export configuration
Type of Test	UNIT
Summary	It will be verified that it is possible to export the simulation configuration and the format of the file that contains it.
Prerequisites	Have finished configuring a simulation following all the steps established for the selection of all the configuration elements.
Steps	<ol style="list-style-type: none"> 1. Access the menu option Simulation setup. 2. Click on the "Download the setup file" button.
Expected results	The export of the file from the interface is allowed, and the content conforms to the design established for this file.
Requirements covered by the test case	AG.D16.FR.001-2

Table 22. Description of UTP-TC-14-001: Load a simulation setup file.

UTP-TC-14-001: Load a simulation setup file	
Scenario ID	SC-14
Scenario Title	Simulation setup - Import configuration
Type of Test	UNIT
Summary	It will be tried to load a simulation configuration file in the application.
Prerequisites	Have a simulation configuration file ready to be imported into the application.
Steps	<ol style="list-style-type: none"> 1. Access the menu option Simulation setup. 2. Click on the "Load setup file" button.
Expected results	After importing the configuration file, the established configuration can be accessed and viewed (and even edited) from the application in the Simulation setup page.
Requirements covered by the test case	AG.D16.FR.001-2

Table 23. Description of UTP-TC-15-001: Try to run the simulation.

UTP-TC-15-001: Try to run a simulation	
Scenario ID	SC-15
Scenario Title	Simulation setup – Launch simulation
Type of Test	UNIT

Summary	Launch a simulation after you have completed all the necessary configurations.
Prerequisites	You have completed the necessary steps to establish a correct simulation configuration.
Steps	<ol style="list-style-type: none"> 1. Access the menu option Simulation setup. 2. Go to step five and click on the "Launch simulation" button.
Expected results	It is verified that the simulation is launched correctly. Although, for now, it will only check that the point where the API was called has been reached, regardless of the impact on the ABM Simulations module.
Requirements covered by the test case	AG.D16.FR.001-2

Table 24. Description of UTP-TC-16-001: View ongoing simulations.

UTP-TC-16-001: View ongoing simulations	
Scenario ID	SC-16
Scenario Title	My simulations – Simulations in progress
Type of Test	UNIT
Summary	After accessing the view of my simulations, it will be verified that the user can see and interact with the list of "Simulations in progress" section.
Prerequisites	Having launched simulations from the simulations configuration view, either through the guided manual configuration or through the importation of an already configured configuration file.
Steps	<ol style="list-style-type: none"> 1. Access the menu option My simulations. 2. Go to the "Simulations in progress" section.
Expected results	It is verified that ongoing simulations appear under the 'Simulations in progress' section, with their corresponding progress bar, a percentage, and buttons to watch (live results), pause or cancel the simulation.
Requirements covered by the test case	AG.D16.FR.001-3

Table 25. Description of UTP-TC-17-001: View finished simulations.

UTP-TC-17-001: View finished simulations	
Scenario ID	SC-17
Scenario Title	My simulations – Finished simulations
Type of Test	UNIT
Summary	It will be verified that the details of the finished simulations can be consulted from the application.
Prerequisites	Have launched simulations from the application, and they are in a finished state. (To carry out these tests, it is recommended to simulate that some of the simulations launched have ended up altering their state internally).
Steps	<ol style="list-style-type: none"> 1. Access the menu option My simulations. 2. Go to the "Finished simulations" section.
Expected results	Check that previously completed simulations appears listed under the 'Finished simulations' section, along with buttons to visualize the results (opening Visualization Module), download the result data into a plaintext/rich text file, or delete the result data.
Requirements covered by the test case	AG.D16.FR.001-3

Table 26. Description of UTP-TC-18-001: Visualise the results from a finished simulation launched from the app.

UTP-TC-18-001: Visualise the results from a finished simulation launched from the app	
Scenario ID	SC-18
Scenario Title	Visualisation Module
Type of Test	UNIT
Summary	It will be verified that the user can view the results of a simulation launched and finished from the application.
Prerequisites	Have finished simulations after launching simulations from the simulation setup view.
Steps	<ol style="list-style-type: none"> 1. Access the menu option My simulations. 2. In the completed simulations section, select a simulation and click on the "see results" button. 3. View results in the visualization module.
Expected results	Check that the results appear satisfactorily in the visualization view, providing details in different graphics.
Requirements covered by the test case	AG.D16.FR.001-4

Table 27. Description of UTP-TC-18-002: Visualise the results from a finished simulation imported from a file.

UTP-TC-18-002: Visualise the results from a finished simulation imported from a file	
Scenario ID	SC-18
Scenario Title	Visualisation Module
Type of Test	UNIT
Summary	It will be verified that the user can view the results of a simulation imported from the results and a well-formed file.
Prerequisites	Have a simulation finished and launched by importing a configuration file.
Steps	<ol style="list-style-type: none"> 1. Access the menu option My simulations. 2. In the completed simulations section, select a simulation (launched from the file) and click on the "see results" button. 3. View results in the visualization module.
Expected results	It is verified that the contained results are correctly interpreted and displayed in the visualization view, showing all the relevant detail in different graphs.
Requirements covered by the test case	AG.D16.FR.001-4

Table 28. Description of UTP-TC-18-002: Download a simulation result in PDF format.

UTP-TC-18-002: Download a simulation result in PDF format	
Scenario ID	SC-18
Scenario Title	Visualisation Module
Type of Test	UNIT
Summary	It will be verified that the user can download the complete result of the simulation in PDF format.
Prerequisites	Have finished simulations launched from the platform or have previously loaded them through the results file.
Steps	<ol style="list-style-type: none"> 1. Click on the Visualization option.

	2. Click the Download visualisation button and selects format PDF to export the report.
Expected results	After clicking on the button enabled to download the simulation results, it is verified that a PDF file has been downloaded, and its content faithfully shows the simulation result as it is displayed on the screen.
Requirements covered by the test case	AG.D16.FR.001-4

Table 29. Description of UTP-TC-19-001: Access to the main page and established navigations.

UTP-TC-19-001: Access to the main page and established navigations	
Scenario ID	SC-19
Scenario Title	AGRICORE Suite Main Page
Type of Test	UNIT
Summary	It will be verified that the user can access the main page, once logged into the system, from which they can navigate to other views of interest on the platform.
Prerequisites	Have access credentials to the agricore interface platform
Steps	1.
Expected results	After logging in with valid credentials, check the main page and navigate to the following views from it correctly: <ul style="list-style-type: none"> • Simulation setup • Synthetic population generator • Simulations • Visualisation of results and (optionally) commuting to/from ARDIT. • His/her catalogue of Policies • Past executed simulations (under My Simulations).
Requirements covered by the test case	AG.D16.FR.001-6

5.6 Traceability Matrix

Table 30. Traceability matrix of the unit tests.

Module	Requirement	Test case ID	TC Description
AG.D16	AG.D16.FR.001-1-1	UTP-TC-02-001	Login in the application with bad credentials
		UTP-TC-02-002	Login in the application with the correct credentials
		UTP-TC-02-003	Login in the application with an advanced user role
AG.D16	AG.D16.FR.001-1-2	UTP-TC-01-001	User Registration
AG.D16	AG.D16.FR.001-1-3	UTP-TC-03-001	Recover account credentials
AG.D16	AG.D16.FR.001-2	UTP-TC-13-001	Export simulation setup file
		UTP-TC-14-001	Load a simulation setup file

		UTP-TC-15-001	Try to run a simulation
AG.D16	AG.D16.FR.001-2-1	UTP-TC-07-001	Access to the simulation setup page
AG.D16	AG.D16.FR.001-2-2	UTP-TC-08-001	Searching for populations from available repositories
		UTP-TC-08-002	Load synthetic population from a file to use it in the simulation setup
AG.D16	AG.D16.FR.001-2-3	UTP-TC-04-001	Create a new private policy
		UTP-TC-04-002	Search for private policies
		UTP-TC-05-001	Create a new general policy
		UTP-TC-05-002	Search for general policies
		UTP-TC-09-001	Selection of Private Policies to be included in the simulation
		UTP-TC-09-002	Selection of General Policies to be included in the simulation
AG.D16	AG.D16.FR.001-2-4	UTP-TC-10-001	Selection of Simulation Period
AG.D16	AG.D16.FR.001-2-5	UTP-TC-11-001	Selection of Solver and Biophysical Model(s)
AG.D16	AG.D16.FR.001-2-6	UTP-TC-12-001	Selection of default KPIs to be computed
AG.D16	AG.D16.FR.001-3	UTP-TC-16-001	View ongoing simulations
		UTP-TC-17-001	View finished simulations
AG.D16	AG.D16.FR.001-4	UTP-TC-18-001	Visualise the results from a finished simulation launched from the app
		UTP-TC-18-002	Visualise the results from a finished simulation imported from a file
		UTP-TC-18-003	Download a simulation result in PDF format
AG.D16	AG.D16.FR.001-5	UTP-TC-06-001	Access to the Synthetic population configuration view
AG.D16	AG.D16.FR.001-5-1		This does not apply to unit tests
AG.D16	AG.D16.FR.001-5-2		This does not apply to unit tests
AG.D16	AG.D16.FR.001-5-3	UTP-TC-06-002	Download the Synthetic population definition
		UTP-TC-06-003	Load Synthetic population definition
AG.D16	AG.D16.FR.001-6	UTP-TC-19-001	Access to the main page and established navigations

5.7 Test report

Table 31. Test report of the unit tests.

Iteration number	Total Cases	Test	Failed Cases		Test Past Cases		Test Untested Cases		Test Observations
			Total	%	Total	%	Total	%	
1	30		0	0	0	0	30	100%	

6 Integrated testing

6.1 Prerequisites for the execution of the plan

For the correct execution of the integrated test plan, all the integration points detected in the design must be correctly implemented both in the Agricore interface and in the rest of the integration destination modules or, failing that, have a Mockup-API that returns the expected results in each situation so that the proposed test cases can be executed.

6.2 Preparation and validation of the test environment

The test environment must have the Agricore interface application interconnected to the intranet where the external modules are active in the organisation against which the integration test cases will be tested:

- Organization LDAP
- DWH
- ARDIT
- ABM Simulation Module

6.3 Participants

The main participants in this type of test will be:

- The Agricore Interface application development team
- A technical interlocutor for the rest of the modules against which the integration is carried out:
 - DWH
 - ARDIT
 - ABM Simulation Module

6.4 Description of scenarios

The integrated test scenarios are defined below:

- SC-01: Connection status.
- SC-02: LDAP Integration.
- SC-03: ARDIT Integration.
- SC-04: Population repositories stored in DWH integration.
- SC-05: Loading population from an external file.
- SC-06: Integration with ABM - Solvers and Biophysical models.
- SC-07: Integration with ABM - General catalogue of policies.
- SC-08: Integration with ABM – KPIS.

- SC-09: Integration with ABM – Simulations.
- SC-10: Integration with ABM - My simulations.
- SC-11: Integration with ABM and DWH - View finished simulations results.

6.5 Test cases

The proposed integration test cases will be described below.

Table 32. Description of ITP-TC-01-001: Check connection status to external modules.

ITP-TC-01-001: Check connection status to external modules	
Scenario ID	SC-01
Scenario Title	Connection status
Type of Test	INTEGRATION
Summary	Check that the connections to the ARDIT, DWH and ABM Simulation Module modules are correct in order to carry out the corresponding integrations from the Agricore Interface application.
Prerequisites	Have the Agricore Interface application installed locally and connected to the intranet of the organization where these tests are carried out and have credentials to access the application.
Steps	<ol style="list-style-type: none"> 1. Specify the credentials to try to access the agricore interface application. 2. If the connectivity to the external modules is correct, three green traffic lights will appear (ARDIT, DWH and ABM).
Expected results	Connectivity to the three required modules (ARDIT, DWH and ABM Simulation Module) appears in green, indicating that everything is correct.
Requirements covered by the test case	AG.D16.FR.001

Table 33. Description of ITP-TC-02-001: New user registration.

ITP-TC-02-001: New user registration	
Scenario ID	SC-02
Scenario Title	LDAP integration
Type of Test	INTEGRATION
Summary	Check the registration process on the agricore interface platform.
Prerequisites	Have access to the agricore interface application.
Steps	<ol style="list-style-type: none"> 1. Open the desktop application agricore interface. 2. Click on the link indicating that he does not have an account and wishes to register. 3. Fill in the required fields in the registration form that appears and submits the data.
Expected results	After completing the registration process by entering the required data: Name, country, valid email and affiliation data (company and/or institution) and accepting the receipt of emails, the creation of the account is confirmed.
Requirements covered by the test case	AG.D16.FR.001-1-2

Table 34. Description of ITP-TC-02-002: Registered user authentication.

ITP-TC-02-002: Registered user authentication	
Scenario ID	SC-02
Scenario Title	LDAP integration
Type of Test	INTEGRATION
Summary	Check that registered users with correct credentials can access the application and the authentication process against the established user repository is carried out correctly.
Prerequisites	Have access to the application and the correct credentials to access it.
Steps	<ol style="list-style-type: none"> 1. Open the desktop application agricore interface. 2. Try to access the application from the login page with your access credentials
Expected results	After entering the correct credentials, it is verified that the user can access the application, and the initial page configured for his access level is shown.
Requirements covered by the test case	AG.D16.FR.001-1-1

Table 35. Description of ITP-TC-02-003: Authentication and authorization of user with an advanced role.

ITP-TC-02-003: Authentication and authorization of user with advanced role	
Scenario ID	SC-02
Scenario Title	LDAP integration
Type of Test	INTEGRATION
Summary	Check correct advanced user access to the application.
Prerequisites	Have access to the application and user credentials with an advanced access level.
Steps	<ol style="list-style-type: none"> 1. Open the desktop application agricore interface. 2. Try to access the application with the correct credentials of a user with an advanced role.
Expected results	After accessing the application, it is verified that the menu options reserved for advanced users appear available.
Requirements covered by the test case	AG.D16.FR.001-1-1

Table 36. Description of ITP-TC-02-004: Setting new password.

ITP-TC-02-004: Setting new password	
Scenario ID	SC-02
Scenario Title	LDAP integration
Type of Test	INTEGRATION
Summary	Check that the user can recover their access credentials in case of loss.
Prerequisites	Have a valid account in the application.
Steps	<ol style="list-style-type: none"> 1. Open the desktop application agricore interface. 2. Click on the link indicating that he has forgotten his password. 3. Fill in the required fields (email) and click on the Recover password button.
Expected results	After clicking on the password loss link and entering your registration email, an email will be sent to the user from which you can reset your password to access the agricore interface platform.

Requirements covered by the test case	AG.D16.FR.001-1-3
---------------------------------------	-------------------

Table 37. Description of ITP-TC-03-001: Verify access to ARDIT from the Agricore Interface application.

ITP-TC-03-001: Verify access to ARDIT from the Agricore Interface application	
Scenario ID	SC-03
Scenario Title	Access to ARDIT from the Agricore interface
Type of Test	INTEGRATION
Summary	Check that ARDIT can be accessed from the Agricore Interface.
Prerequisites	Have successfully executed test case ITP-TC-01-001
Steps	<ol style="list-style-type: none"> Go to the Synthetic population option. Click on the link to access ARDIT
Expected results	The user can access ARDIT to consult the defined Datasets and manually incorporate them into the simulation configuration in Agricore Interface.
Requirements covered by the test case	AG.D16.FR.001-5-1

Table 38. Description of ITP-TC-04-001: Selecting a population repository by consulting the DWH.

ITP-TC-04-001: Selecting a populations repository by consulting the DWH	
Scenario ID	SC-04
Scenario Title	Integration with population repositories in DWH
Type of Test	INTEGRATION
Summary	Check that it is allowed to search for populations in the DWH repositories available from the interface.
Prerequisites	Have successfully executed test case ITP-TC-01-001
Steps	<ol style="list-style-type: none"> Go to the Simulation Setup menu option. In the first step, "1. Synthetic population", search for a repository from the section: Select a population from the repository
Expected results	It is verified that for each repository selectable from the "Select a population from the repository" functionality, it is possible to perform a search without population errors and valid results are displayed.
Requirements covered by the test case	AG.D16.FR.001-2-2

Table 39. Description of ITP-TC-05-001: Loading and processing of the population file in the Agricore interface.

ITP-TC-05-001: Loading and processing of the population file in the Agricore interface	
Scenario ID	SC-05
Scenario Title	Loading population from an external file
Type of Test	INTEGRATION
Summary	It will be verified that the advanced user can load a file with the definition of a synthetic population from his computer to incorporate it into the simulation configuration.
Prerequisites	Have access credentials in advanced user mode and have a file with the format required for the definition of a synthetic population.

Steps	<ol style="list-style-type: none"> 1. Go to the Simulation Setup menu option. 2. In the first step, "1. Synthetic population", try to load a synthetic population from an external file in the section: Load a population from an external file.
Expected results	The advanced user can successfully import the file he has with the definition of the synthetic population to be incorporated into the simulation configuration.
Requirements covered by the test case	AG.D16.FR.001-5-3

Table 40. Description of ITP-TC-06-001: Query Solvers and Biophysical models.

ITP-TC-06-001: Query Solvers and Biophysical models	
Scenario ID	SC-06
Scenario Title	Integration with ABM - Solvers and Biophysical models
Type of Test	INTEGRATION
Summary	It will be verified that the ABM API call returns data after querying Solvers and Biophysical models.
Prerequisites	Have successfully executed test case ITP-TC-01-001
Steps	<ol style="list-style-type: none"> 1. Go to the Simulation Setup menu option. 2. In the fourth step, "4. Solvers and biophysical models", try to select a Solver and Biophysical model item from the dropdown lists that appear.
Expected results	It is verified that the call to the ABM API works correctly, and data from Solvers and Biophysical models are returned to inform the selection fields in their corresponding sections.
Requirements covered by the test case	AG.D16.FR.001-2-5

Table 41. Description of ITP-TC-07-001: Query the general catalogue of policies.

ITP-TC-07-001: Query the general catalogue of policies	
Scenario ID	SC-07
Scenario Title	Integration with ABM - General catalogue of policies
Type of Test	INTEGRATION
Summary	It will be verified that the call to the ABM API correctly returns the general catalogue of policies and that it is presented correctly in the Agricore Interface application.
Prerequisites	Have successfully executed test case ITP-TC-01-001
Steps	<ol style="list-style-type: none"> 1. Go to the menu option Catalogs of policies -> General catalogue of policies.
Expected results	The call to the ABM API returns the data referring to the general catalogue of policies, and these are displayed correctly in their corresponding section, "General policies" so that they can be selected by the user.
Requirements covered by the test case	AG.D16.FR.001-2-3

Table 42. Description of ITP-TC-07-002: Create a new policy in the general catalogue.

ITP-TC-07-002: Create a new policy in the general catalogue	
Scenario ID	SC-07
Scenario Title	Integration with ABM - General catalogue of policies
Type of Test	INTEGRATION

Summary	It will be verified that a new policy can be created in the general catalogue through the ABM API.
Prerequisites	Have successfully executed test case ITP-TC-01-001
Steps	<ol style="list-style-type: none"> 1. Go to the menu option Catalogs of policies -> General catalogue of policies. 2. Click on the "Create a new policy" button. 3. Fill in the required fields of the form that appears and click on the "Send" button.
Expected results	It is verified that after filling in the form with the fields required for the creation of a new policy in the general catalogue and invoking the ABM API, the policy is created correctly. To verify this, refer back to the general catalogue policies query from the ABM API, re-running the execution of the above test case.
Requirements covered by the test case	AG.D16.FR.001-2-3

Table 43. Description of ITP-TC-07-003: Modifying a policy in the general catalogue of policies.

ITP-TC-07-003: Modifying a policy in the general catalogue of policies	
Scenario ID	SC-07
Scenario Title	Integration with ABM - General catalogue of policies
Type of Test	INTEGRATION
Summary	It will be verified that it is possible to update the data of an existing policy in the general catalogue of policies by calling the ABM API.
Prerequisites	Have successfully executed test case ITP-TC-01-001
Steps	<ol style="list-style-type: none"> 1. Go to the menu option Catalogs of policies -> General catalogue of policies. 2. Select an existing policy from the list. 3. Click on the "Edit policy" button. 4. Change some of the pre-filled data for the policy that can be edited and hit the "Submit" button.
Expected results	It is verified that after invoking the ABM API to update policies in the general catalogue. The data of the indicated policy is correctly updated in the catalogue. To verify this, refer back to the general catalogue policies query from the ABM API, re-running the execution of the above test case.
Requirements covered by the test case	AG.D16.FR.001-2-3

Table 44. Description of ITP-TC-07-004: Deleting a policy in the general catalogue of policies.

ITP-TC-07-004: Deleting a policy in the general catalogue of policies	
Scenario ID	SC-07
Scenario Title	Integration with ABM - General catalogue of policies
Type of Test	INTEGRATION
Summary	It will be verified that it is possible to remove a policy from the general catalogue of policies by calling the ABM API.
Prerequisites	Have successfully executed test case ITP-TC-01-001
Steps	<ol style="list-style-type: none"> 1. Go to the menu option Catalogs of policies -> General catalogue of policies. 2. Select an existing policy from the list. 3. Click on the "Delete policy" button.

Expected results	It is verified that after selecting a policy from the general catalogue to delete and invoking the ABM API, the selected policy is deleted. To verify this, refer back to the general catalogue policies query from the ABM API, re-running the execution of the above test case.
Requirements covered by the test case	AG.D16.FR.001-2-3

Table 45. Description of ITP-TC-08-001: Query of KPIS without prior establishment of policy.

ITP-TC-08-001: Query of KPIS without prior establishment of policy	
Scenario ID	SC-08
Scenario Title	Integration with ABM - KPIS
Type of Test	INTEGRATION
Summary	List of KPIS without prior selection of policy from the general catalogue by calling the ABM API
Prerequisites	Have successfully executed test case ITP-TC-01-001
Steps	<ol style="list-style-type: none"> 1. Go to the menu option Simulation setup. 2. Go to the fifth step to select KPIS.
Expected results	It is verified that the API returns all the KPIS available to be listed in the KPIS selection section since a policy has not been previously selected from the general catalogue.
Requirements covered by the test case	AG.D16.FR.001-2-6

Table 46. Description of ITP-TC-08-002: KPIS query previously establishing a general catalogue policy.

ITP-TC-08-002: KPIS query previously establishing a general catalogue policy	
Scenario ID	SC-08
Scenario Title	Integration with ABM - KPIS
Type of Test	INTEGRATION
Summary	List of KPIS associated with a general policy previously selected from the general catalogue.
Prerequisites	Have successfully executed test case ITP-TC-01-001 and have previously selected a policy from the general catalogue of policies.
Steps	<ol style="list-style-type: none"> 1. Go to the menu option Simulation setup. 2. Go to the fifth step to select KPIS.
Expected results	It is verified that the ABM API returns all the KPIS associated with the selected general catalogue policy.
Requirements covered by the test case	AG.D16.FR.001-2-6

Table 47. Description of ITP-TC-09-001: Launch a simulation previously selecting all the necessary elements.

ITP-TC-09-001: Launch a simulation previously selecting all the necessary elements	
Scenario ID	SC-09
Scenario Title	Integration with ABM - Simulations
Type of Test	INTEGRATION

Summary	A call to the ABM API will be checked to launch a previously configured simulation with all the necessary elements selected and contained in the JSON file that is passed as a parameter.
Prerequisites	Have successfully executed test case #1 and have selected all the elements necessary to set up a simulation.
Steps	<ol style="list-style-type: none"> Go to the menu option Simulation setup. Go to step 6 and click on the button enabled to launch the simulation.
Expected results	It is verified that the call to the ABM API is successful, and the simulation is accepted at the destination by means of an ACK response code.
Requirements covered by the test case	AG.D16.FR.001-2

Table 48. Description of ITP-TC-10-001: List all simulations in progress.

ITP-TC-10-001: List all simulations in progress	
Scenario ID	SC-10
Scenario Title	Integration with ABM - My simulations
Type of Test	INTEGRATION
Summary	It will be verified that it is possible to call the ABM API to return all the simulations in progress at a given time.
Prerequisites	Have successfully executed test case #1 and have launched at least one simulation to the ABM Simulation Module.
Steps	<ol style="list-style-type: none"> Go to the "My simulations" menu option -> Simulations in progress section.
Expected results	It is verified that the ABM API service returns all currently running simulations as a result. These simulation elements are correctly presented in the simulations in progress view.
Requirements covered by the test case	AG.D16.FR.001-3

Table 49. Description of ITP-TC-10-002: View the status of a simulation in progress.

ITP-TC-10-002: View the status of a simulation in progress	
Scenario ID	SC-10
Scenario Title	Integration with ABM - My simulations
Type of Test	INTEGRATION
Summary	It will be verified that it is possible to invoke the API and ABM to consult the status in which a certain simulation is in progress.
Prerequisites	Have successfully executed test case #1 and have simulations in progress.
Steps	<ol style="list-style-type: none"> Go to the "My simulations" menu option -> Simulations in progress section. Click on the update status icon in the current simulations section.
Expected results	It is verified that the ABM API returns progress for a given simulation, and this progress is appropriately reflected in the Simulations in Progress view in the agricore interface.
Requirements covered by the test case	AG.D16.FR.001-3

Table 50. Description of ITP-TC-10-003: Pause simulation process.

ITP-TC-10-003: Pause simulation process	
Scenario ID	SC-10
Scenario Title	Integration with ABM - My simulations
Type of Test	INTEGRATION
Summary	It will be verified that it is possible to pause a simulation in progress of the application and that the call to the ABM Simulation Module API is carried out correctly.
Prerequisites	Have successfully executed test case #1 and have simulations in progress and not finished.
Steps	<ol style="list-style-type: none"> 1. Go to the "My simulations" menu option -> Simulations in progress section. 2. Select an unfinished simulation and click on the pause simulation icon.
Expected results	It is verified that pausing a simulation launched from the application is allowed and that the call to the ABM Simulation Module API is carried out correctly.
Requirements covered by the test case	AG.D16.FR.001-3

Table 51. Description of ITP-TC-10-004: Stop the simulation process.

ITP-TC-10-004: Stop the simulation process	
Scenario ID	SC-10
Scenario Title	Integration with ABM - My simulations
Type of Test	INTEGRATION
Summary	It will be verified that it is possible to stop a simulation in progress of the application and that the call to the ABM Simulation Module API is carried out correctly.
Prerequisites	Have successfully executed test case #1 and have simulations in progress and not finished.
Steps	<ol style="list-style-type: none"> 1. Go to the "My simulations" menu option -> Simulations in progress section. 2. Select an unfinished simulation and click on the stop simulation icon.
Expected results	It is verified that stopping a simulation launched from the application is allowed and that the call to the ABM Simulation Module API is carried out correctly.
Requirements covered by the test case	AG.D16.FR.001-3

Table 52. Description of ITP-TC-11-001: Visualise the results from a finished simulation launched from the app and store in DWH.

ITP-TC-11-001: Visualise the results from a finished simulation launched from the app and store in DWH	
Scenario ID	SC-11
Scenario Title	Integration with ABM and DWH - View finished simulations results
Type of Test	INTEGRATION
Summary	It will be verified that you can access the DWH and view the results of a completed simulation that has previously been output by the ABM Simulation Module.
Prerequisites	Have finished simulation results in DWH after launching simulations from the simulation setup view.
Steps	<ol style="list-style-type: none"> 1. Go to the My simulations menu option -> Finished simulations section.

	2. Click on an item in the list to view details of the results for the finished simulation.
Expected results	Check that the results appear satisfactorily in the visualization view, providing details in different graphics.
Requirements covered by the test case	AG.D16.FR.001-4

6.6 Traceability Matrix

The traceability matrix is presented below to establish the coverage of the functional requirements described in the section Functional Requirements.

Table 53. Traceability matrix of integrated testing.

Module	Requirement	Test case ID	TC Description
AG.D16	AG.D16.FR.001-1-1	FTP-TC-01-001	Login in the application
AG.D16	AG.D16.FR.001-1-2	FTP-TC-01-002	User Registration
AG.D16	AG.D16.FR.001-1-3	FTP-TC-01-003	Recover account credentials
AG.D16	AG.D16.FR.001-2-1	FTP-TC-02-001	Behaviour of the SSP (Simulation Setup Page) view
AG.D16	AG.D16.FR.001-2-2	FTP-TC-02-002	Synthetic population selection from a repository
		FTP-TC-02-003	Load synthetic population from a file
AG.D16	AG.D16.FR.001-2-3	FTP-TC-02-004	Selection of Policies to be included in the simulation
AG.D16	AG.D16.FR.001-2-4	FTP-TC-02-005	Selection of Simulation Period
AG.D16	AG.D16.FR.001-2-5	FTP-TC-02-006	Selection of Solver and Biophysical Model(s)
AG.D16	AG.D16.FR.001-2-6	FTP-TC-02-007	Selection of default KPIs to be computed
AG.D16	AG.D16.FR.001-3	FTP-TC-03-001	View ongoing simulations
		FTP-TC-03-002	View finished simulations
AG.D16	AG.D16.FR.001-4	FTP-TC-03-003	Visualise the results from a finished simulation launched from the app
		FTP-TC-03-004	Visualise the results from a finished simulation imported from a file
		FTP-TC-03-005	Download a simulation result in PDF format
		FTP-TC-03-006	Attempted creation of a custom visualization by an advanced user
AG.D16	AG.D16.FR.001-5	FTP-TC-04-001	Access to the Synthetic population configuration view
AG.D16	AG.D16.FR.001-5-1	Do not apply functional tests on this requirement.	

AG.D16	AG.D16.FR.001-5-2	Do not apply functional tests on this requirement.	
AG.D16	AG.D16.FR.001-5-3	FTP-TC-04-002	Load Synthetic population definition
AG.D16	AG.D16.FR.001-6	FTP-TC-05-001	Access to the main page and established navigations

6.7 Test report

The results of the execution of functional tests are shown below.

Table 54. Test report of the integrated testing.

Iteration number	Total Cases	Test Failed Cases	Test Past Cases		Test Untested Cases		Test Observations
			Total	%	Total	%	
1	19	0	0	0	19	100%	

7 Functional testing

7.1 Prerequisites for the execution of the plan

Having successfully executed the unit and integrated test plans and having read the user manual of the Agricore interface application or having functional support during the execution of this test plan.

7.2 Preparation and validation of the test environment

The user (or users) performing the tests must have the agricore interface application installed on their local computer, as well as internet access to cover the integration needs with the rest of the agricore suite tools.

7.3 Participants

The Agricore interface development team, together with the project leadership team, must validate the execution of these functional tests.

7.4 Description of scenarios

The scenarios that will be tested will be those referring to each module of the application and that are described below:

- SC-01: Access to the agricore interface
- SC-02: Simulation setup
- SC-03: Visualisation module
- SC-04: Synthetic Population Generator Module
- SC-05: AGRICORE Suite Main Page

7.5 Test cases

The different test cases proposed by each scenario are described below.

Table 55. Description of FTP-TC-01-001: Login in the application.

FTP-TC-01-001: Login in the application	
Scenario ID	SC-01
Scenario Title	Access to the agricore interface
Type of Test	FUNCTIONAL
Summary	Check that registered users with an account in the application can access the agricore interface platform.
Prerequisites	Have access to the agricore interface platform and have a valid account in the Agricore interface after passing the registration process.
Steps	1. The user opens the desktop application agricore interface

	2. The user tries to access the application from the login page with his access credentials
Expected results	After entering the username and password from the login page, the user accesses the application and is shown the AGRICORE Suite Lobby view.
Requirements covered by the test case	AG.D16.FR.001-1-1

Table 56. Description of FTP-TC-01-002: User Registration.

FTP-TC-01-002: User Registration	
Scenario ID	SC-01
Scenario Title	Access to the agricore interface
Type of Test	FUNCTIONAL
Summary	Check the registration process on the agricore interface platform.
Prerequisites	Have access to the agricore interface platform
Steps	<ol style="list-style-type: none"> 1. The user opens the desktop application agricore interface 2. The user clicks on the link indicating that he does not have an account and wishes to register. 3. The user fills in the required fields in the registration form that appears and submits the data.
Expected results	After completing the registration process by entering the required data: Name, country, valid email and affiliation data (company and/or institution) and accepting the receipt of emails, the creation of the account is confirmed. Repeat test case 01-001 to confirm that the user can access the platform.
Requirements covered by the test case	AG.D16.FR.001-1-2

Table 57. Description of FTP-TC-01-003: Recover account credentials.

FTP-TC-01-003: Recover account credentials	
Scenario ID	SC-01
Scenario Title	Access to the agricore interface
Type of Test	FUNCTIONAL
Summary	Check that the user can recover their access credentials in case of loss.
Prerequisites	Have a valid account in the application
Steps	<ol style="list-style-type: none"> 1. The user opens the desktop application agricore interface 2. The user clicks on the link indicating that he has forgotten his password. 3. The user fills in the required fields (email) and clicks on the Recover password button.
Expected results	After clicking on the password loss link and entering your registration email, an email will be sent to the user from which you can reset your password to access the agricore interface platform.
Requirements covered by the test case	AG.D16.FR.001-1-3

Table 58. Description of FTP-TC-02-001: Behavior of the SSP (Simulation Setup Page) view.

FTP-TC-02-001: Behavior of the SSP (Simulation Setup Page) view	
Scenario ID	SC-02

Scenario Title	Simulation setup
Type of Test	FUNCTIONAL
Summary	It will be verified that the user can access the main page from which all the necessary steps are available to define a new simulation and the behaviour of the view in case he leaves this option.
Prerequisites	Have a valid account in the application and access the Simulation Setup page and start to define a new simulation.
Steps	<ol style="list-style-type: none"> 1. The user logs into the agricore interface application 2. The user clicks on the link Simulation setup 3. The user begins the definition of a simulation by filling in various fields arbitrarily. 4. The user attempts to leave the simulation setup page by navigating to another available application option.
Expected results	When the user leaves the simulation setup page without having downloaded the setup file, a message should appear indicating whether to proceed without saving the configuration established up to that moment or to lose the changes.
Requirements covered by the test case	AG.D16.FR.001-2-1

Table 59. Description of FTP-TC-02-002: Synthetic population selection from a repository.

FTP-TC-02-002: Synthetic population selection from a repository	
Scenario ID	SC-02
Scenario Title	Simulation setup
Type of Test	FUNCTIONAL
Summary	Selection of a previously defined synthetic population from the repository.
Prerequisites	The user must be able to access the simulation definition page and have synthetic populations loaded in the repository to be able to select one.
Steps	<ol style="list-style-type: none"> 1. The user logs into the agricore interface application 2. The user clicks on the link Simulation setup 3. The user in the Synthetic population section attempts to select a population element from the repository. 4. The user selects the required data in the form: repository, base year and others. 5. The user selects a population from the list to incorporate it into the configuration.
Expected results	After informing the necessary fields for the search of a synthetic population (search repository, simulation base year and other required information of interest), the user can select it from the contextual list that appears and use it as part of the configuration in the simulation that he intends.
Requirements covered by the test case	AG.D16.FR.001-2-2

Table 60. Description of FTP-TC-02-003: Load synthetic population from a file.

FTP-TC-02-003: Load synthetic population from a file	
Scenario ID	SC-02
Scenario Title	Simulation setup
Type of Test	FUNCTIONAL
Summary	Selection of a previously defined synthetic population from a local file according to the required format to be able to be imported.

Prerequisites	Check that the user can use a local file containing the definition of a synthetic population to incorporate it as part of the configuration in the simulation he is defining.
Steps	<ol style="list-style-type: none"> 1. The user logs into the agricore interface application 2. The user clicks on the link Simulation setup 3. The user in the Synthetic population section attempts to import a population from a format file. 4. The user selects the file to be imported.
Expected results	After loading the file, it is verified that the user can use the synthetic population contained as part of the configuration in the simulation that he is defining.
Requirements covered by the test case	AG.D16.FR.001-2-2

Table 61. Description of FTP-TC-02-004: Selection of Policies to be included in the simulation.

FTP-TC-02-004: Selection of Policies to be included in the simulation	
Scenario ID	SC-02
Scenario Title	Simulation setup
Type of Test	FUNCTIONAL
Summary	The user will select a Policy Description from their personal catalogue to incorporate it into the simulation configuration.
Prerequisites	Have a Policy Description in your personal catalogue (either because they have been incorporated from the general catalogue. or because you have policies described by the user himself)
Steps	<ol style="list-style-type: none"> 1. The user logs into the agricore interface application 2. The user clicks on the link Simulation setup 3. The user in the Policy section selects a policy. 4. Finally, click on the Next button
Expected results	After selecting the policy description to be incorporated into the configuration and downloading the configuration file, it is verified that the policy has been successfully incorporated.
Requirements covered by the test case	AG.D16.FR.001-2-3

Table 62. Description of FTP-TC-02-005: Selection of Simulation Period.

FTP-TC-02-005: Selection of Simulation Period	
Scenario ID	SC-02
Scenario Title	Simulation setup
Type of Test	FUNCTIONAL
Summary	It will be verified that the user can select the simulation period to incorporate it into the configuration.
Prerequisites	Have access to the local agricore interface platform and have data loaded for period selection.
Steps	<ol style="list-style-type: none"> 1. The user logs into the agricore interface application 2. The user clicks on the link Simulation setup 3. The user in the Simulation horizon section specifies a period after selecting year, Time unit (year, season), and Number of time units to simulate. 4. Finally, click on the Next button

Expected results	It is verified that the user can select the necessary data to establish the simulation period in the configuration: base year, season, and number of time units to simulate.
Requirements covered by the test case	AG.D16.FR.001-2-4

Table 63. Description of FTP-TC-02-006: Selection of Solver and Biophysical Model(s).

FTP-TC-02-006: Selection of Solver and Biophysical Model(s)	
Scenario ID	SC-02
Scenario Title	Simulation setup
Type of Test	FUNCTIONAL
Summary	It will be verified that the user can select Solver and Biophysical Model elements to incorporate them into the simulation configuration.
Prerequisites	Have access to the local platform and have data loaded for the Solver and Biophysical model selection fields.
Steps	<ol style="list-style-type: none"> 1. The user logs into the agricore interface application 2. The user clicks on the link Simulation setup 3. The user in the Selection of solver and biophysical models section selects a solver and biophysical model. 4. Finally, click on the Next button
Expected results	It is verified that the user can select Solver and Biophysical model elements and incorporate them into the simulation configuration file. To do this, download the configuration file and check that these elements have been added correctly.
Requirements covered by the test case	AG.D16.FR.001-2-5

Table 64. Description of FTP-TC-02-007: Selection of default KPIs to be computed.

FTP-TC-02-007: Selection of default KPIs to be computed	
Scenario ID	SC-02
Scenario Title	Simulation setup
Type of Test	FUNCTIONAL
Summary	It will be verified that the user can select a set of default KPIs to be incorporated into the simulation process.
Prerequisites	Have access to the local agricore interface platform and have KPIs data available for selection.
Steps	<ol style="list-style-type: none"> 1. The user logs into the agricore interface application 2. The user clicks on the link Simulation setup 3. The user in the Select KPIs section selects one KPI Available. 4. Finally, click on the Next button
Expected results	After selecting a set of KPIs and incorporating them into the simulation, it is verified that they appear correctly specified in the generated file.
Requirements covered by the test case	AG.D16.FR.001-2-6

Table 65. Description of FTP-TC-03-001: View ongoing simulations.

FTP-TC-03-001: View ongoing simulations	
Scenario ID	SC-03
Scenario Title	Visualisation Module

Type of Test	FUNCTIONAL
Summary	After accessing the view of my simulations, it will be verified that the user can see and interact with the list of simulations in progress section.
Prerequisites	Having launched simulations from the simulations configuration view, either through the guided manual configuration or through the importation of an already configured configuration file.
Steps	1. The user logs into the agricore interface application 2. The user clicks on the link My simulations.
Expected results	It is verified that ongoing simulations appear under the 'Simulations in progress' section, with their corresponding progress bar percentage and buttons to watch (live results), pause or cancel the simulation.
Requirements covered by the test case	AG.D16.FR.001-3

Table 66. Description of FTP-TC-03-002: View finished simulations.

FTP-TC-03-002: View finished simulations	
Scenario ID	SC-03
Scenario Title	Visualisation Module
Type of Test	FUNCTIONAL
Summary	After accessing the view of my simulations, it will be verified that the user can see and interact with the list of Finished simulations section.
Prerequisites	Have finished simulations after launching simulations from the simulation setup view.
Steps	1. The user logs into the agricore interface application 2. The user clicks on the link My simulations.
Expected results	Check that previously completed simulations appears listed under the 'Finished simulations' section, along with buttons to visualize the results (opening Visualization Module), download the result data into a plaintext/rich text file, or delete the result data.
Requirements covered by the test case	AG.D16.FR.001-3

Table 67. Description of FTP-TC-03-003: Visualise the results from a finished simulation launched from the app.

FTP-TC-03-003: Visualise the results from a finished simulation launched from the app	
Scenario ID	SC-03
Scenario Title	Visualisation Module
Type of Test	FUNCTIONAL
Summary	It will be verified that the user can view the results of a simulation launched and finished from the application.
Prerequisites	Have finished simulations after launching simulations from the simulation setup view.
Steps	1. The user logs into the agricore interface application 2. The user clicks on the link Visualization.
Expected results	Check that the results appear satisfactorily in the visualization view, providing details in different graphics.
Requirements covered by the test case	AG.D16.FR.001-4

Table 68. Description of FTP-TC-03-004: Visualise the results from a finished simulation imported from a file.

FTP-TC-03-004: Visualise the results from a finished simulation imported from a file	
Scenario ID	SC-03
Scenario Title	Visualisation Module
Type of Test	FUNCTIONAL
Summary	It will be verified that the user can view the results of a simulation imported from a result and well-formed file.
Prerequisites	Have a well-formed file of the results of a certain simulation that can be interpreted by the platform.
Steps	<ol style="list-style-type: none"> 1. The user logs into the agricore interface application 2. The user clicks on the link Visualization. 3. User clicks the Add a new results file button to import a results file
Expected results	After importing the results file into the platform, it is verified that the contained results are correctly interpreted and displayed in the visualization view, showing all the relevant detail in different graphs.
Requirements covered by the test case	AG.D16.FR.001-4

Table 69. Description of FTP-TC-03-005: Download a simulation result in PDF format.

FTP-TC-03-005: Download a simulation result in PDF format	
Scenario ID	SC-03
Scenario Title	Visualisation Module
Type of Test	FUNCTIONAL
Summary	It will be verified that the user can download the complete result of the simulation in PDF format.
Prerequisites	Have finished simulations launched from the platform or have previously loaded them through the results file.
Steps	<ol style="list-style-type: none"> 1. The user logs into the agricore interface application 2. The user clicks on the link Visualization. 3. User clicks the Download visualisation button and selects format PDF to export the report.
Expected results	After clicking on the button enabled to download the simulation results, it is verified that a PDF file has been downloaded, and its content faithfully shows the simulation result as it is displayed on the screen.
Requirements covered by the test case	AG.D16.FR.001-4

Table 70. Description of FTP-TC-03-006: Attempted creation of a custom visualization by an advanced user.

FTP-TC-03-006: Attempted creation of a custom visualization by an advanced user	
Scenario ID	SC-03
Scenario Title	Visualisation Module
Type of Test	FUNCTIONAL
Summary	It will be verified that the platform provides the ability for advanced users to create their own advanced visualizations by opening the Jupyter IDE with loading raw simulation results.

Prerequisites	Have credentials to access as an advanced user and have simulation results loaded and completed on the platform.
Steps	<ol style="list-style-type: none"> 1. The user logs into the application with the credentials of an advanced user. 2. The user clicks on the link Visualization. 3. The user clicks on the button enabled for advanced visualization.
Expected results	After clicking on the button enabled for advanced visualization, it is verified that the Jupyter IDE opens with the raw result data of the preselected simulation.
Requirements covered by the test case	AG.D16.FR.001-4

Table 71. Description of FTP-TC-04-001: Access to the Synthetic population configuration view.

FTP-TC-04-001: Access to the Synthetic population configuration view	
Scenario ID	SC-04
Scenario Title	Synthetic Population Generator Module
Type of Test	FUNCTIONAL
Summary	It will be verified that an advanced user has access to the Synthetic population generator view and has data loaded in order to start a sample configuration.
Prerequisites	Have access credentials in advanced user mode and have data loaded on the platform to be able to start an example of the generation/configuration of a Synthetic population.
Steps	<ol style="list-style-type: none"> 1. The user logs into the application with the credentials of an advanced user. 2. The user clicks on the link Synthetic population. 3. The user clicks on the create button and fills in the required fields in the form.
Expected results	It is verified that the advanced user can access the Synthetic population generator module and has data loaded in the selection fields to start a sample generation.
Requirements covered by the test case	AG.D16.FR.001-5

Table 72. Description of FTP-TC-04-002: Load Synthetic population definition.

FTP-TC-04-002: Load Synthetic population definition	
Scenario ID	SC-04
Scenario Title	Synthetic Population Generator Module
Type of Test	FUNCTIONAL
Summary	It will be verified that the advanced user can load a file with the definition of a synthetic population from his computer to incorporate it into the simulation configuration.
Prerequisites	Have access credentials in advanced user mode and have a file with the format required for the definition of a synthetic population.
Steps	<ol style="list-style-type: none"> 1. The user logs into the application with the credentials of an advanced user. 2. The user clicks on the link Synthetic population. 3. The user clicks on the button to upload the defined Synthetic popularization from a file.
Expected results	The advanced user can successfully import the file he has with the definition of the synthetic population to be incorporated into the simulation configuration.
Requirements covered by the test case	AG.D16.FR.001-5-3

Table 73. Description of FTP-TC-05-001: Access to the main page and established navigations.

FTP-TC-05-001: Access to the main page and established navigations	
Scenario ID	SC-05
Scenario Title	AGRICORE Suite Main Page
Type of Test	FUNCTIONAL
Summary	It will be verified that the user can access the main page once logged into the system, from which they can navigate to other views of interest on the platform.
Prerequisites	Have access credentials to the agricore interface platform.
Steps	1. The user logs into the application with his/her credentials.
Expected results	After logging in with valid credentials, the user can access the main page and navigate to the following views from it: <ul style="list-style-type: none"> • Simulation setup • Synthetic population generator • Simulations • Visualisation of results and (optionally) commuting to/from ARDIT. • His/her catalogue of Policies • Past executed simulations (under My Simulations).
Requirements covered by the test case	AG.D16.FR.001-6

7.6 Traceability Matrix

The traceability matrix is presented below to establish the coverage of the functional requirements described in the section Functional Requirements.

Table 74. Traceability matrix of the functional testing.

Module	Requirement	Test case ID	TC Description
AG.D16	AG.D16.FR.001-1-1	FTP-TC-01-001	Login in the application
AG.D16	AG.D16.FR.001-1-2	FTP-TC-01-002	User Registration
AG.D16	AG.D16.FR.001-1-3	FTP-TC-01-003	Recover account credentials
AG.D16	AG.D16.FR.001-2-1	FTP-TC-02-001	Behaviour of the SSP (Simulation Setup Page) view
AG.D16	AG.D16.FR.001-2-2	FTP-TC-02-002	Synthetic population selection from a repository
		FTP-TC-02-003	Load synthetic population from a file
AG.D16	AG.D16.FR.001-2-3	FTP-TC-02-004	Selection of Policies to be included in the simulation
AG.D16	AG.D16.FR.001-2-4	FTP-TC-02-005	Selection of Simulation Period
AG.D16	AG.D16.FR.001-2-5	FTP-TC-02-006	Selection of Solver and Biophysical Model(s)
AG.D16	AG.D16.FR.001-2-6	FTP-TC-02-007	Selection of default KPIs to be computed

AG.D16	AG.D16.FR.001-3	FTP-TC-03-001	View ongoing simulations
		FTP-TC-03-002	View finished simulations
AG.D16	AG.D16.FR.001-4	FTP-TC-03-003	Visualise the results from a finished simulation launched from the app
		FTP-TC-03-004	Visualise the results from a finished simulation imported from a file
		FTP-TC-03-005	Download a simulation result in PDF format
		FTP-TC-03-006	Attempted creation of a custom visualization by an advanced user
AG.D16	AG.D16.FR.001-5	FTP-TC-04-001	Access to the Synthetic population configuration view
AG.D16	AG.D16.FR.001-5-1	Do not apply functional tests on this requirement	
AG.D16	AG.D16.FR.001-5-2	Do not apply functional tests on this requirement	
AG.D16	AG.D16.FR.001-5-3	FTP-TC-04-002	Load Synthetic population definition
AG.D16	AG.D16.FR.001-6	FTP-TC-05-001	Access to the main page and established navigations

7.7 Test report

The results of the execution of functional tests are shown below.

Table 75. Test report of the functional testing.

Iteration number	Total Cases	Test Failed Cases	Test Past Cases	Test Untested Cases	Test Observations
1	19	0	0	19	100%

8 UAT testing

These tests will be executed in the final phase of the project.

8.1 Prerequisites for the execution of the plan

User acceptance testing will determine end users' compliance with the finished product. As a step prior to the execution of these tests, the participating end users must have been called, conveniently informing them of the date and time, and said call must have been formally accepted by the users.

8.2 Preparation and validation of the test environment

You must have a fully functional environment for an organisation. This includes all the external components with which the agricore interface application integrates:

- LDAP
- DWH
- ARDIT
- ABM Simulation Module

8.3 Participants

The test team must be made up of a representative of each functional module (Agricore Interface, DWH, ARDIT and ABM Simulation Module), as well as the users called. These tests can be executed in view and approval mode: It will be a member of the development team who interacts with the system and conveniently explains each test case that is going to be executed so that all attendees are aligned and can verify the correct behaviour of the application in each test case. Or it will be the user who runs each test case with the corresponding assistance from a member of the development team.

8.4 Description of scenarios

The following scenarios are considered for the approach of the proposed test cases:

- SC-01: Access to the agricore interface
- SC-02: AGRICORE Suite Main Page
- SC-03: Simulation Setup
- SC-04: Visualisation Module

8.5 Test cases

The different test cases proposed by each scenario are described below.

Table 76. Description of UAT-TC-01-001: User Registration.

UAT-TC-01-001: User Registration	
Scenario ID	SC-01
Scenario Title	Access to the agricore interface
Type of Test	UAT
Summary	Check the registration process on the agricore interface platform
Prerequisites	Have access to the agricore interface platform
Steps	<ol style="list-style-type: none"> 1. The user opens the desktop application agricore interface. 2. The user clicks on the link indicating that he does not have an account and wishes to register. 3. The user fills in the required fields in the registration form that appears and submits the data.
Expected results	After completing the registration process by entering the required data: Name, country, valid email and affiliation data (company and/or institution) and accepting the receipt of emails, the creation of the account is confirmed.
Requirements covered by the test case	AG.D16.FR.001-1-2

Table 77. Description of UAT-TC-01-002: Login in the application.

UAT-TC-01-002: Login in the application	
Scenario ID	SC-01
Scenario Title	Access to the agricore interface
Type of Test	UAT
Summary	Check that registered users with an account in the application can access the agricore interface platform.
Prerequisites	Have access to the agricore interface platform and have a valid account in the Agricore interface after passing the registration process.
Steps	<ol style="list-style-type: none"> 1. The user opens the desktop application agricore interface. 2. The user tries to access the application from the login page with his access credentials
Expected results	After entering the username and password from the login page, the user accesses the application and is shown the AGRICORE Suite Lobby view.
Requirements covered by the test case	AG.D16.FR.001-1-1

Table 78. Description of UAT-TC-01-003: Recover account credentials.

UAT-TC-01-003: Recover account credentials	
Scenario ID	SC-03
Scenario Title	Access to the agricore interface
Type of Test	UAT
Summary	Check that the user can recover their access credentials in case of loss.
Prerequisites	Have a valid account in the application.
Steps	<ol style="list-style-type: none"> 1. The user opens the desktop application agricore interface. 2. The user clicks on the link indicating that he has forgotten his password. 3. The user fills in the required fields (email) and clicks on the Recover password button.

Expected results	After clicking on the password loss link and entering your registration email, an email will be sent to the user from which you can reset your password to access the agricore interface platform.
Requirements covered by the test case	AG.D16.FR.001-1-3

Table 79. Description of UAT-TC-02-001: Access to the main page and established navigations.

UAT-TC-02-001: Access to the main page and established navigations	
Scenario ID	SC-02
Scenario Title	AGRICORE Suite Main Page
Type of Test	UAT
Summary	It will be verified that the user can access the main page, once logged into the system, from which they can navigate to other views of interest on the platform.
Prerequisites	Have access credentials to the agricore interface platform
Steps	1. The user logs into the application with his/her credentials.
Expected results	After logging in with valid credentials, the user can access the main page and navigate to the following views from it: <ul style="list-style-type: none"> • Simulation setup • Synthetic population generator • Simulations • Visualization of results and (optionally) commuting to/from ARDIT. • His/her catalogue of Policies • Past executed simulations (under My Simulations).
Requirements covered by the test case	AG.D16.FR.001-6

Table 80. Description of UAT-TC-03-001: Synthetic population selection from a repository.

UAT-TC-03-001: Synthetic population selection from a repository	
Scenario ID	SC-03
Scenario Title	Simulation Setup
Type of Test	UAT
Summary	Selection of a previously defined synthetic population from the repository.
Prerequisites	The user must be able to access the simulation definition page and have synthetic populations loaded in the repository to be able to select one.
Steps	<ol style="list-style-type: none"> 1. Access the Simulation Setup menu option. 2. Go to the first step of the simulation to define the population to incorporate (Synthetic population). 3. Select a repository from the Select a population from the repository section.
Expected results	After informing the necessary fields for the search of a synthetic population (search repository, simulation base year and other required information of interest), the user can select it from the contextual list that appears and use it as part of the configuration in the simulation that he intends. define.
Requirements covered by the test case	AG.D16.FR.001-2-2

Table 81. Description of UAT-TC-03-002: Selection of Policies to be included in the simulation.

UAT-TC-03-002: Selection of Policies to be included in the simulation	
Scenario ID	SC-03
Scenario Title	Simulation Setup
Type of Test	UAT
Summary	The user will select a policy from the general catalogue of policies to incorporate it into the simulation configuration.
Prerequisites	Have selectable policies from the general catalogue
Steps	<ol style="list-style-type: none"> 1. Access the Simulation Setup menu option. 2. Go to the second step of the simulation configuration and select a policy from the general catalogue.
Expected results	After selecting the policy description to be incorporated into the configuration and downloading the configuration file, it is verified that the policy has been successfully incorporated.
Requirements covered by the test case	AG.D16.FR.001-2-3

Table 82. Description of UAT-TC-03-003: Selection of Simulation Period.

UAT-TC-03-003: Selection of Simulation Period	
Scenario ID	SC-01
Scenario Title	Simulation Setup
Type of Test	UAT
Summary	It will be verified that the user can select the simulation period to incorporate it into the configuration.
Prerequisites	Have access to the local agricore interface platform and have data loaded for period selection.
Steps	<ol style="list-style-type: none"> 1. Access the Simulation Setup menu option. 2. Go to the horizon selection step and specify the base year, Time unit and Number of time units. 3. Click on the Next button
Expected results	It is verified that the user can select the necessary data to establish the simulation period in the configuration: base year, season, and number of time units to simulate.
Requirements covered by the test case	AG.D16.FR.001-2-4

Table 83. Description of UAT-TC-03-004: Selection of Solver and Biophysical Model(s).

UAT-TC-03-004: Selection of Solver and Biophysical Model(s)	
Scenario ID	SC-03
Scenario Title	Simulation Setup
Type of Test	UAT
Summary	It will be verified that the user can select Solver and Biophysical Model elements to incorporate them into the simulation configuration.
Prerequisites	Have access to the local platform and have data loaded for the Solver and Biophysical model selection fields.
Steps	<ol style="list-style-type: none"> 1. Access the Simulation Setup menu option. 2. Go to the selection step of solver and biophysical models.

	<ol style="list-style-type: none"> 3. Select data from dropdowns enabled for both configuration items. 4. Click on the Next button
Expected results	It is verified that the user can select the necessary data to establish the simulation period in the configuration: base year, season, and number of time units to simulate.
Requirements covered by the test case	AG.D16.FR.001-2-4

Table 84. Description of UAT-TC-03-005: Selection of KPIs to be computed.

UAT-TC-03-005: Selection of KPIs to be computed	
Scenario ID	SC-03
Scenario Title	Simulation Setup
Type of Test	UAT
Summary	It will be verified that the user can select a set of default KPIs to be incorporated into the simulation process.
Prerequisites	Have access to the local agricore interface platform and have KPIs data available for selection associated with the selected policy.
Steps	<ol style="list-style-type: none"> 1. Access the Simulation Setup menu option. 2. Go to the KPIs selection step. 3. Select the KPIs to be incorporated into the configuration. 4. Click on the Next button.
Expected results	After selecting a set of KPIs and incorporating them into the simulation, it is verified that they appear correctly specified in the generated file.
Requirements covered by the test case	AG.D16.FR.001-2-6

Table 85. Description of UAT-TC-03-005: Launch simulation.

UAT-TC-03-005: Launch simulation	
Scenario ID	SC-03
Scenario Title	Simulation Setup
Type of Test	UAT
Summary	Launch a simulation after you have completed all the necessary configurations.
Prerequisites	You have completed the necessary steps to establish a correct simulation configuration.
Steps	<ol style="list-style-type: none"> 1. Access the Simulation Setup menu option. 2. Go to the step to launch the simulation. 3. Click on the Launch Simulation button.
Expected results	It is verified that the simulation is launched correctly without communication problems with the ABM module. In the ABM Simulation Module, it is checked that a new input is registered for the submitted simulation and is queued to run.
Requirements covered by the test case	AG.D16.FR.001-2

Table 86. Description of UAT-TC-04-001: View ongoing simulations.

UAT-TC-04-001: View ongoing simulations	
Scenario ID	SC-04
Scenario Title	Visualisation Module

Type of Test	UAT
Summary	After accessing the view of my simulations, it will be verified that the user can see and interact with the list of simulations in progress section.
Prerequisites	Having launched simulations from the simulations configuration view, either through the guided manual configuration or through the importation of an already configured configuration file.
Steps	<ol style="list-style-type: none"> 1. Access the My simulations menu option. 2. Go to the Simulations in progress section.
Expected results	It is verified that ongoing simulations appear under the 'Simulations in progress' section, with their corresponding progress bar, a percentage, and buttons to watch (live results), pause or cancel the simulation.
Requirements covered by the test case	AG.D16.FR.001-3

Table 87. Description of UAT-TC-04-002: Refresh ongoing simulations progress.

UAT-TC-04-002: Refresh ongoing simulations progress	
Scenario ID	SC-04
Scenario Title	Visualisation Module
Type of Test	UAT
Summary	The refresh of simulations in progress will be checked from the Agricore Interface to report their progress.
Prerequisites	Have simulations in progress.
Steps	<ol style="list-style-type: none"> 1. Access the My simulations menu option. 2. Go to the Simulations in progress section. 3. Click on the enabled icon to refresh the view.
Expected results	It is verified that after updating the status of the simulations in progress, the progress of each simulation is correctly reflected in the view.
Requirements covered by the test case	AG.D16.FR.001-3

Table 88. Description of UAT-TC-04-003: View finished simulations.

UAT-TC-04-003: View finished simulations	
Scenario ID	SC-04
Scenario Title	Visualisation Module
Type of Test	UAT
Summary	After accessing the view of my simulations, it will be verified that the user can see and interact with the list of Finished simulations section.
Prerequisites	Have finished simulations after launching simulations from the simulation setup view.
Steps	<ol style="list-style-type: none"> 1. Access the My simulations menu option. 2. Go to the Finished simulations section.
Expected results	Check that previously completed simulations appears listed under the 'Finished simulations' section, along with buttons to visualise the results (opening Visualization Module), download the result data into a plaintext/rich text file, or delete the result data.
Requirements covered by the test case	AG.D16.FR.001-3

Table 89. Description of UAT-TC-04-004: View detailed results for a finished simulation.

UAT-TC-04-004: View detailed results for a finished simulation	
Scenario ID	SC-04
Scenario Title	Visualisation Module
Type of Test	UAT
Summary	It will be verified that the user can view the results of a simulation launched and finished from the application.
Prerequisites	Have finished simulations after launching simulations from the simulation setup view.
Steps	<ol style="list-style-type: none"> 1. Access the My simulations menu option. 2. Go to the Finished simulations section. 3. Select a completed simulation to view detailed results from the Visualisation page.
Expected results	Check that the results appear satisfactorily in the visualization view, providing details in different graphics.
Requirements covered by the test case	AG.D16.FR.001-4

Table 90. Description of UAT-TC-04-005: Download a simulation result in PDF format.

UAT-TC-04-005: Download a simulation result in PDF format	
Scenario ID	SC-04
Scenario Title	Visualisation Module
Type of Test	UAT
Summary	It will be verified that the user can download the complete result of the simulation in PDF format.
Prerequisites	Have finished simulations launched from the platform or have previously loaded them through the results file.
Steps	<ol style="list-style-type: none"> 1. Access the My simulations menu option. 2. Go to the Finished simulations section. 3. Select a completed simulation to view detailed results from the Visualisation page.
Expected results	After clicking on the button enabled to download the simulation results, it is verified that a PDF file is downloaded and its content faithfully shows the simulation result as it is displayed on the screen.
Requirements covered by the test case	AG.D16.FR.001-4

8.6 Traceability Matrix

Table 91. Traceability matrix of the UAT testing.

Module	Requirement	Test case ID	TC Description
AG.D16	AG.D16.FR.001-1-1	UAT-TC-01-002	Login in the application
AG.D16	AG.D16.FR.001-1-2	UAT-TC-01-001	User Registration
AG.D16	AG.D16.FR.001-1-3	UAT-TC-01-003	Recover account credentials

AG.D16	AG.D16.FR.001-2-1	UAT-TC-01-003	Synthetic population selection from a repository
AG.D16	AG.D16.FR.001-2-2	UAT-TC-03-001	Synthetic population selection from a repository
AG.D16	AG.D16.FR.001-2-3	UAT-TC-03-002	Selection of Policies to be included in the simulation
AG.D16	AG.D16.FR.001-2-4	UAT-TC-03-003	Selection of Simulation Period
AG.D16	AG.D16.FR.001-2-5	UAT-TC-03-004	Selection of Solver and Biophysical Model(s)
AG.D16	AG.D16.FR.001-2-6	UAT-TC-03-005	Selection of KPIs to be computed
AG.D16	AG.D16.FR.001-3	UAT-TC-04-001	View ongoing simulations
		UAT-TC-04-002	Refresh ongoing simulations progress
		UAT-TC-04-003	View finished simulations
AG.D16	AG.D16.FR.001-4	UAT-TC-04-004	View detailed results for a finished simulation
		UAT-TC-04-005	Download a simulation result in PDF format
AG.D16	AG.D16.FR.001-5	User tests are not considered for these requirements since they do not provide the functionality to the user of the Agricore Interface application.	
AG.D16	AG.D16.FR.001-5-1		
AG.D16	AG.D16.FR.001-5-2		
AG.D16	AG.D16.FR.001-5-3		
AG.D16	AG.D16.FR.001-6	UAT-TC-02-001	Access to the main page and established navigations

8.7 Test report

Table 92. Test report of the UAT testing.

Iteration number	Total Cases	Test	Failed Cases	Test	Past Cases	Test	Untested Cases	Test	Observations
		Total	%	Total	%	Total	%		
1	15	0	0	0	0	0	15	100%	

For preparing this report, the following deliverables have been taken into consideration:

Deliverable Number	Deliverable Title	Lead beneficiary	Type	Dissemination Level	Due date
D4.6	D4.6 AGRICORE interface	AAT	Report	Public	M39