

Database on breeding activities

The construction of this database was based on an inquiry answered by several institutions/ companies.

Access is a program that facilitates the storage and retrieval of structured information on computers hard drive. An Access database can not only contain a collection of related data tables, but also several different types of database objects: saved queries for organizing data; forms for interacting with the data on screen; reports for printing results.

Tables are where data in a database is stored; consequently, tables form the core of any database application.

In this database there are 4 major tables (**1-Research Centre; 2-Lab; 3-Researcher, 4-Data**) 2 “sub-tables” (**Researcher vs Species; Data vs Researcher**) and 2 auxiliary tables (**Species and Countries**). In the 4 major tables it was included a field with a sequential number, this field being fundamental for the relation between tables and for the integrity of the database.

The **Researcher vs Species** table is intended for keeping information regarding the species with which each researcher works. This table is filled-in simultaneous with table Researcher.

The **Data vs Researcher** table is intended for relating data of the tests with the researchers. This table is filled-in at the same time as table Data.

The auxiliary tables, **Species** and **Countries**, contain species and countries lists. This information will be used when the tables and sub-tables are filled-in. The advantage of this is not only to avoid mistakes but also to ensure that both Species and Countries are always written the same way - which is relevant in terms of Queries. For example: if someone wants know who works with the species *Quercus robur* we will make a Query and choose the species *Quercus robur* – which is different from *Q. robur*. If the names are spelled in varying forms, only partial data will be found under each entry. This criterion permits to extract information through Queries in an effective way.

The data in the tables Countries and Species are:

Countries: Portugal, Spain and France

Species: *Castanea sp*, *Cryptomeria japonica*, *Eucalyptus (others)*, *Eucalyptus globulus*, *Eucalyptus globulus (Subspecies)*, *Eucalyptus nitens*, *Juglans regia*, *Pinus pinaster*, *Pinus pinea*, *Pinus radiata*, *Populus*, *Prunus avium*, *Pseudotsuga menziesii*, *Quercus petraea*, *Quercus robur*, *Quercus rotundifolia*, *Quercus suber*, *Ulmus sp*.

Forms provide a user-oriented interface to the data in a database application. They allow to specify in detail the appearance and behaviour of the data on screen and to exert a certain amount of control over the user's additions and modifications to the data. Forms do not contain any data. Instead, they provide a "window" through which tables and queries can be viewed.

To visualise the data in the database, you should open the Forms related to 4 major tables. The Form is "the way of introduction of the data"; the Forms will allow visualising all the fields of a record. If you visualise data in tables, they will look like excel.

Queries allow the user to join data from one or more tables, order the data in different ways, calculate new fields, and specify criteria to filter out certain records. A Query it self contains no data-it merely reorganizes the data from the table (or tables) on which it is built without changing the "underlying tables" in any way.

Steps to perform a Query:

- 1 – Use the **New** Button in the Queries pane of the database window.
- 2 – A window will appear with the queries methods; choose **Design View** (creates queries from scratch)
- 3 – **Show Table** window will appear, listing all the tables in the database. **Add** the tables that contain the fields you want in the query.

The upper pane contains field lists for the tables on which the query is based. The lower pane contains the actual query definition. **Field row** shows the name of the fields included in the query. **Table row** shows the name of the table that the field comes from. **Sort Row** allows you to specify the order in which the records are displayed. **Show boxes** determine whether fields included in the query are actually displayed. **Criteria row** allows you to specify criteria for including or excluding records from the results set.

- 4 – Select the fields you wish to project and drag them into the query definition grid. Alternatively, double-click the field.

- 5 – Press the **datasheet** icon on the tool bar to see the results of the query. Press the design icon to return to design mode.

To see the data of the queries through a Form, **close** the query and **save** it. Select the query and click the **New Object: AutoForm** button, or select the Form pane and press the **new** button, choose the query/table and the type of Form.

To view the data of the query through a report, select the report pane, press the **new** button and chose the query/table and the type of report.

Examples of queries

Some examples of queries were built based in the following questions:

1 – List of institutions.

Fields: RC Short Name; RC Name, Country. To make this query the only table needed is the RESEARCH CENTER table.

2 – Who are the researchers working in the institutions and which species are they working with?

Fields: RC short name; Country; R first name; R last name; species. The tables necessary for this query are RESEARCH CENTER, RESEARCHER and Species vs Researcher. If we want the data to appear ordered by country, in **Sort Row** of the country column select Ascending

3 – Which species are being studied in Portugal and with which objective?

Fields: Country (It will be asked which country); RC short name; Species; Objectives. The tables necessary for this query are RESEARCH CENTER and DATA. To be able to choose the country, we must write the name of the country in the **Criteria row** of the country field.

4 – Who is working with the species (possibility of choosing the species) and with which objectives?

For example: **Quercus robur**. Fields: Species, Objectives, RC short name; R first name R last name. The tables necessary for this query are RESEARCH CENTER, DATA and RESEARCHER. To be able to choose the specie, write [which specie?] in the criteria row of the field species.

5 – Which institutions are performing Half-sib progeny trials?

Fields: RC short name, species, objectives, H-sib progeny trials: n° fam, n° sites, T area. The tables necessary for this query are RESEARCH CENTER, and DATA. A lot of zero data will appear; to avoid this, in the **Criteria row** of the fields H-sib progeny trials: n° fam, write “>0”