

AGROBASE generation II™

Introductory to Advanced Training Course Five Day Course Information and Agenda

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Who Should Attend? This course is designed for those who have never or only occasionally used this software but want to increase their basic proficiency, or those who have an intermediate knowledge, or the more advanced users who wish to learn more of the software's features in-depth. The more experienced users might not need to take the first two days, those wanting the advanced topics would take the last two days. If you are not into plant breeding *per se*, but variety testing, or are not interested in the plant breeding topics, you would focus on the first three days if you are new to the software, or the second and third day. ***Note that days 3 and 4 have an additional evening session especially for trainees coming for the last two days – the more advanced part of the course.***

Requirements In all cases, this course assumes a basic competence in the use of computer software and operating systems as well as basic terminology in agronomy and plant breeding. All trainees must have their own laptop computer with a demo or registered version of the software installed before the course. You are also expected to either bring a copy of your own relational database in Generation II ("research group") or data files (Excel®, dBASE®, text) with your own experiments and data to develop your own research group during the course.

Day 1- Research Groups, Experiments, Data Import and Export, Trials

This day of instruction is mandatory for all new users, or for those who need to ensure the most basic competency in using this software. More advanced users, or those who have taken this part of the course previously, could begin on the following day. The topics from this day will be assumed and not covered in the following days of instruction.

8:30 -10:00 am

- Welcome and introductions
- Verify installation of software in all trainee laptops – the software should have been previously installed
- Understanding research groups and relational database software
- Creating, accessing, joining, duplicating, and managing a research group
- Data security, backups, and LAN issues
- Navigating a research group – menus, interface, Help system
- Using the research data explorer to access treatments, experiments, nurseries, trials, locations, years
- Addition and definition of an initial set of data traits for your practice research group
- Managing traits: grouping, exporting, importing
- **Class Exercise:** Creation and initial development of your "practice" research group for this course

10:00-10:15 am

- Refreshment break

10:15 to 12:00 pm

- Addition and definition of locations and location groups
- Treatments (varieties, hybrids, fertilizer levels, herbicides, etc.): their creation, grouping, and use
- Importing treatments from entry lists and other files
- Drag and drop capabilities
- Finding treatments in the research group

• **Class exercise:** importing sample treatment lists - trainees are encouraged to bring dBase®, Excel®, or other file types to the course to help develop their own practice research group

12:00 to 1:00 pm

- Lunch break, possibly as a group depending upon venue
- Interaction with the course instructor as possible with the group

1:00 to 3:00 pm

- Designing experiments – RCBD and split plots, other designs depending upon group interest
- Exporting experiments to Excel or dBase
- Importing experiments from the DEMO research group
- Viewing data in your experiments – display options, locking traits, sorting, setting trait orders
- System settings, split screens, data entry and validation, etc.
- “Static” traits – their use in experiments, relevance
- **Class exercise:** importing your own experiment and data into your practice research group – trainees are encouraged to bring sample files of their current experiments in progress or past experiments

3:00 to 3:15 pm

- Refreshment break

3:15 to 4:30 pm

- Perennial experiments – depending upon interest
- Sub-sampling – depending upon interest
- Modifying and deleting experiments
- Fillers in experiments
- Correcting for planting errors
- Grouping experiments
- Grouping and managing multi-location experiments (trials)

4:30 to 5:00 pm

- Review from the day – questions from the day’s topics
- Trainee’s own time to work on the day’s topics
- Interact with instructor on specific questions

Day 2 - Planting Plans, Field Layout of Experiments, Reports, Labels

This day focuses on the practical aspects of laying out experiments, trials and nurseries. The trainee will use the experiments created in Day 1 in their practice research group.

8:30 to 10:00 am

- Exporting trials
- Importing a trial from the DEMO research group
- Optimizing your use of your research group through grouping experiments, trials, and treatments
- **Class exercise:** importing a trial from your research data – trainees are encouraged to bring a sample file with their own data to further develop their own practice research group

10:00 to 10:15 am • Refreshment break

10:15 to 12:00 pm

- Visual design of planting plans
- Creating fields maps and sowing order lists
- Planting and harvest order numbers
- Saving and exporting planting plans to Excel and other file formats
- Management of sites and plans
- **Class exercise:** make your own planting plan(s) using experiments from your practice research group
- Generating reports via the Visual FoxPro report generator

12:00 to 1:00 pm

- Lunch break, possibly as a group depending upon venue
- Interaction with the course instructor as possible with the group

1:00 to 3:00 pm

- Introduction to the report generator: Designing field books
- Designing labels and barcodes, printing multiple labels

- Sorting and filtering prior to generating reports or labels
- **Class exercise:** make your own reports or labels using your practice research group
- Importing data into existing experiments in a research group, especially via Excel files

3:00 to 3:15 pm

- Refreshment break

3:15 to 4:30 pm

- Using the Generation II to Excel “express link”
- Importance of import profiles
- Notes on traits in each experiment

4:30 to 5:00 pm

- Review from the day’s topics, answers for any trainee specific questions
- Trainee’s own time to work on the day’s topics
- Interact with instructor on specific questions.

Day 3: Data Entry, Manipulation, Analysis, Varietal Comparisons, Images

With the experiments planted and data now coming in during the season, this day focuses on data manipulation and calculations, basic analysis of variance, and varietal comparisons.

8:30 to 10:00 am

- Transformation (calculation) of data in your research group
- Building functions and logical conditions (filters)
- Managing calculated traits
- Transformation scales for categorical and other types of data
- Graphs – bar, line, and point, trend maps of field data

10:00 to 10:15 am

- Refreshment break

10:15 to 12:00 pm

- Working with a PDA to download data to your research group
 - Using the Gen IIPDA utility to download your data to your research group
 - Data analysis – ANOVA for an RCBD
 - Linear models, options, and basic understanding ANOVA output
 - Saving analyses to MS-Word® or Adobe Acrobat®
- Note: Since this is an introductory course, only a very basic knowledge of statistics is assumed

12:00 to 1:00 pm

- Lunch break, possibly as a group depending upon venue
- Interaction with the course instructor as possible with the group

1:00 to 3:00 pm

- Performing multiple single analyses of variance
- Accessing other analyses in Generation II – histograms, descriptive statistics, regression, correlation
- Viewing means stored from analyses of variance for single factor experiments
- Computing ranks, percent of checks or varieties
- System settings for displays
- Generating reports from means tables
- Creating selection indices and new groups of varieties or hybrids
- Strategies for completing the yield testing cycle from one year to the next
- **Class exercise:** creating a selection index and new treatment group using your practice research group

3:00 to 3:15 pm

- Refreshment break

3:15 to 4:30 pm

- Varietal comparisons – context in Generation II
- Head-to-Head comparisons of varieties or hybrids over years and locations
- Rolling average summaries across multi-year trials for unbalanced data sets
- Performance grid to view relative varietal performance across locations within a year
- Awareness of GxE analyses with stored means

- **Image Display Module:** Image display for treatments, traits, plots, experiments

4:30 to 5:00 pm

- Review from the day's topics, answers for any trainee specific questions
- Trainee's own time to work on the day's topics
- Interact with instructor on specific questions

Special Evening Session #1

This session is open to all trainees, but especially for those coming for the last two days for the "advanced course". This session will go over the many new features in the last two years of Generation II, to ensure that everyone is working at the most optimal level in Generation II. For trainees who have been working with this software even for many years, less than optimal ways or approaches may have been adopted over time. This session will be a "refresher" and offer ways to "think outside of the box" for many operations in Generation II. Trainees who have been "too busy" to read through all the newsletters about our software enhancements will have the chance to find out what they have been missing.

7:00 to 9:00 pm

- Review of the new features in the most recent versions of Generation II
- Ensuring the most optimal use of Generation II
- Trainee questions on topics that won't be directly covered in Days 4 and 5

Day 4 - Plant Breeding System: Parents, Crosses, Populations, Nurseries

This day focuses entirely on the breeding system. This would be an introduction if you have never used the software before, or a chance to refresh your knowledge and ask for help in "fine tuning" the software for you if you are a more advanced user. We will try to accommodate as many different crops and breeding schemes – whether self-pollinating, hybrid development, clonal crops breeding, and more.

8:30 to 10:00 am

- Identifying genotypes with desirable traits – querying the research group
- Parental genotypes for a breeding program – grouping, history, etc.
- Exporting and importing lists of parents from the DEMO research group
- **Class exercise:** importing lists of parents from your breeding program – trainees are encouraged to bring files with names of parents and any other descriptors (pedigree, source, etc.) from their breeding program to develop their practice research group

10:00 to 10:15 am

- Refreshment break

10:15 to 12:00 pm

- Generating crosses for various breeding schemes – self-pollinating, cross pollinating, polycrossing, cytoplasmic male sterile systems, synthetics, etc.
- Confirming and managing crosses
- Developing populations from crosses
- Developing nurseries with populations and other genetic material
- Making selections and segregating populations, clones, doubled haploids, etc.
- Viewing data from previous nurseries within a current nursery
- **Class exercise:** Make your own crosses from your own parental lists, then design populations, nurseries, make selections – learn to follow the "basic cycle" in Generation II

12:00 to 1:00 pm

- Lunch break, possibly as a group depending upon venue
- Interaction with the course instructor as possible with the group

1:00 to 3:00 pm

- Developing crosses and using 19 different breeding methods from within a nursery
- Viewing histories of populations
- Managing populations
- Grouping populations, nurseries
- Finding parents or populations in the breeding system
- Importing populations and crosses
- Relating the breeding system to the agronomic system
- "Converting" genotypes between the two systems

- Renaming populations – using the renaming tool

- **Class exercise:** Making crosses from within a nursery, learning about more of the breeding events and capabilities

3:00 to 3:15 pm

- Refreshment break

3:15 to 4:30 pm

- Dendograms – seeing the connections across generations
- Questions and synthesis of the day's instruction
- Individual interaction with the instructor as time permits
- Review of exercises and assistance from instructor as time permits

Special Evening Session #2

This session is open to all trainees, but especially for those coming for the last two days for the “advanced course”. The focus will be advanced topics in experimental design. Trainees are encouraged to have some of their own data for analysis

7:00 to 9:00 pm

- Incomplete bloc designs - advantages and disadvantages
- Non-replicated designs – field layout, analysis, advantages and disadvantages
- Nearest neighbours designs and analysis – the advantages of spatial designs
- The GenStat® to AGROBASE Generation II Link
- Line x Tester and Diallel designs

Day 5 – Advanced Topics

This day is for advanced users only, and will presume a basic to intermediate competence in using the software. These topics concern more advanced features in the software are not covered in the introductory course. There is also time for you to come with your specific needs and questions, and more group interaction.

8:30 to 10:00 am: Functions and Expressions

- Mastering complex FoxPro functions and expressions for searching, filtering, calculations
- AGROBASE Generation II special functions
- Using system and memory variables
- **Class exercise:** Writing functions and expressions for your particular needs

10:00 to 10:15 am

- Refreshment break

10:15 to 12:00 pm: Advanced Report Generation

- Advanced report generation – title page, summary, bands and groupings, object properties, report variables, conditional printing, data grouping, aligning and resizing, calculations within a report, colors
- **Class exercise:** Tackling your specific report generation needs

12:00 to 1:00 pm

- Lunch break, possibly as a group depending upon venue
- Interaction with the course instructor as possible with the group

1:00 to 3:00 pm: Breeding and Varietal Comparisons

- Cross prediction
- Progeny analysis
- Varietal comparisons – in-depth review and their relevance, especially with your own data

3:00 to 3:15 pm

- Refreshment break

3:15 to 4:00 pm

- Final questions and synthesis
- Individual interaction with the instructor as time permits for your specific needs and questions