

Research and Development

Final Project Report

(Not to be used for LINK projects)

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Project title

Testing of OrgPlan Conversion Planning software

DEFRA project code

OF 0331

Contractor organisation
and location

Institute of Rural Studies
 University of Wales, Aberystwyth
 Llanbadarn Campus, Aberystwyth

Total DEFRA project costs

£ 17183

Project start date

01/01/03

Project end date

30/05/03

Executive summary (maximum 2 sides A4)

OrgPlan is a computer package designed to support farmers and consultant in planning a conversion to organic farming. It consists of two main elements (the basis planning module that is part of the EMA software) and a database with data for organic, in-conversion and conventional data that can be loaded into the software. It was developed with DEFRA funding (OF 0159) by a partnership between the University of Wales, Aberystwyth, the University of Hertfordshire, Elm Farm Research Centre and SAC.

The objective of this work was to obtain feedback on the suitability of the software OrgPlan in supporting the process of planning a conversion to organic farming before its general release. Given the risk of the organic conversion process and the sensitive nature of the financial reports that OrgPlan can generate, further testing with consultants experienced in organic conversion planning was carried out. The work was broken down in four objectives. Independent of this OrgPlan has been used by the contractor in the context of research work, in particular the Modelling of Strategies of Organic Milk Production (OF 0146).

Objective 1: Update of standard data

The contractor updated the OrgPlan database with data from the 2002/03 Organic Farm Management Handbook and other sources.

Objective 2: Workshops and Field testing of the software

Three workshops with a total 22 consultants were held during which they were given a basic introduction to the use of OrgPlan and had a first opportunity to use the software on their own computer or appropriate workstations. The workshop also provided a good forum to discuss the concept and layout of the software and thus valuable feedback to the developers. Afterwards, each consultants was given the software for further testing, many returned their comments in writing.

The feedback from the consultants confirmed that OrgPlan can effectively support several aspects of a first broad brush planning of an organic conversion (rotation planning, cropping and livestock enterprises, feasibility of a proposed organic scenario in terms of financial output, nutrient and forage budgets) and can assist with more detailed financial planning of investments, leading to Profit and Loss and Cash-Flow forecasts. However, it is designed for users that have a basic understanding of what the process of conversion planning involves. User should further have basic computing skill and the programme has an in-built user-guide and a show-me function and will be release with a step guide how to use it. Those that intend to use OrgPlan in a professional capacity would benefit from specific training on how to use the software, such courses on how to use the software should be offered after the release on a regular basis. OrgPlan could have a wider application in whole farm planning, but this would require extending the database to cover a wider range of enterprises common on conventional farms.

Key strength identified by the consultants (not in order of importance)

- Financial planning
- Availability of basic enterprise data set
- Rotation planning and nutrient budgets
- Combination of financial and nutrient data in one package
- Create different scenarios giving instant access for reassessment of options
- Possibility to 'tweak' a scenario
- Library, navigation around the collection is excellent
- Help topics clear and straightforward
- Broad brush stroke planning, particularly for farms planning new enterprises

Key weaknesses (not in order of importance)

- Limited range of enterprises in the database, particularly for horticultural crops
- Problems with set-up, use of database and understanding all functions
- Need for regular updates of the dataset
- P and K Fertilisers routinely included in organic enterprises
- Data entry in some sections is long-winded

Objective 3: Essential corrections to the software and update of advisory section

Based on all feedback received a list of all problems and suggestions for further improvement was compiled. All changes that are essential for basic functioning (including most changes to the database set and step guide) or easy to implement will be corrected before a release of the software and are summarised in a list of action points at the end of the scientific report. Other suggestions that entail more complicated programming work and hence greater uncertainty in estimating the time required to correct them are included in a as ideas for future development of OrgPlan. Suggestions for further improvement made by the consultants that cannot be implemented at this point include were related to the following issues:

- Improved data entry and data presentation in graphs,
- The need to consider new policy (CAP reform) and other developments,
- Include a broader range of enterprises and examples of the impact of conversion on different farm types,
- Consider the distribution of farm-yard manures and further nutrient management, summing up of land area and forage supply according to organic status in the scenario evaluation,
- Include labour issues
- Include balance sheet function for improved detailed financial planning.

Objective 3 also included a full update of the Soil Association Standards as an HTML document for the EMA 2002 advisory section, which have been completely revised since the original development of the conversion planning software.

Objective 4: Final report

This is the final report submitted to DEFRA. The contractor will also submit to DEFRA a concept outlining the steps to be taken for the release of the software that is envisaged for the autumn 2003.

Scientific report (maximum 20 sides A4)**Susanne Padel, UWA and John Tzilivakis, UH**

July 2003

1 Background and work programme

The objective of this work was to obtain feedback on the suitability of OrgPlan in supporting the process of organic conversion planning before a general release of the software. Given the risk of the organic conversion process and the sensitive nature of the financial projection that can be made with the help of OrgPlan, further testing was felt to be essential to build confidence that the software can support conversion planning effectively. Consultants experienced in organic conversion planning were invited to participate and provide feedback to the developers in return for a free training workshop on how to use the software and a free license for EMA 2002. The work was broken down in four objectives:

Objective 1: Update of standard data

In order to carry out the testing with up-to-date information, the contractor updated the database section of OrgPlan with data from the 2002/03 Organic Farm Management Handbook and other sources. This work was completed before the first workshop in Aberystwyth.

Objective 2: Workshops and Field testing of the software

Consultants were invited to attend one day training workshop during which they received basic introduction of the aims of OrgPlan and how to use the software. Three workshops were held, a fourth one had to be cancelled because of a low number of participants. In return for providing some further written feedback consultants were offered a license to use EMA 2002, the OrgPlan database based on 2002/03 Organic Farm Management Handbook, installation notices and a step guide, all free of charge. If consultants had brought their own notebook to the workshop the software was installed during the meeting, other experienced some problems with installation of the prototype which usually could be resolved over the phone. The workshop did not just provide training to the consultants but also valuable feedback for the developers. The first section of this report contains a list of workshops held and a summary of the general points discussed at each workshop.

In a further step consultants was expected to carry out some testing of the software in his or her own time and they were asked to return a short written report of their experience using OrgPlan and any specific problems. A total of 22 consultants agreed to participate in the field testing. At the date when this report was compiled 14 had returned their comments and one returned the disc no longer in a position to contribute; the others have been sent a reminder. In third sections their comments have been summarised according to the different sections of the software. Each section includes suggestions for further improvements that were made by the consultants. The developers have commented on which of these points can be acted upon before the first release and which would require further work to be taken up.

Objective 3: Essential corrections to the software and update of advisory section

Based on this a list of action points was compiled which was submitted to DEFRA at the beginning of June and is included at the end of this report. Changes involving programming work have been rated on a scale of 1 to 5 (1 being easy, 5 being very difficult). We are aiming to implement any 1 rated suggestions prior to release, but those rated 2 to 5 will entail significant work and as the difficulty increases so does the uncertainty to estimate the time required to fix them. These are included as ideas for future development of OrgPlan.

This objective also included a full update of the Soil Association Standards as an HTML document for the EMA 2002 advisory section which have been completely revised since the original development of the conversion planning software.

Objective 4: Final report

The second section of this report summarises the main discussion points at the workshop. In the following sections the contributions of the individual consultants are collated and edited into one document structured according to the different sections of the software. Each section contains a short summary of the consultants' experience, problems that were encountered and suggestions for further improvement with comments of the developers on their implementation. The final section contains a list of action points that are to be implemented before the release of the software and a summary of the main suggestions made for further improvement. The contractor will also submit a discussion paper outline the strategy for the release of the software which is envisaged for the autumns 2003 and discuss this with the DEFRA and the project partners.

2 Workshops

Three workshops with consultants were held and OrgPlan was introduced to a group of vegetables producers at an HDRA seminar. Overall the reception that OrgPlan received at the workshop was positive, proving that it has potential as a tool for consultants in assisting with conversion planning. However, the workshops confirmed the need to sort out some points before the software can be released which was further refined, based on the comments sent by individual consultants and is included in the sections below.

Date	Location	Number of participants
9 th January 2003	Organic Centre Wales, Aberystwyth	7 participants
19 th February 2003	Elm Farm Research Centre, Hampstead Marshall	9 participants
10 th or March 2003	SAC Edinburgh	6 participants

A fourth workshop with Abacus and other consultants was scheduled twice (16th of February at UH and 8th of May at HDRA), but both had to be cancelled because of low numbers and short term cancellations. However, two Abacus consultants agreed to look at the software without training and one written report has been included in the summary below.

In addition, the software was presented on the 21st of January at HDRA to the linked farmers of the DEFRA Project of "Conversion to organic field scale vegetable production" (OF 0191)

Key discussions about the nutrient budgets

The workshops made clear that organic farming consultants do not have a standard approach for nutrient budgeting and the potential educational effect that the farm gate nutrient balances was illustrated, despite the limitations of the approach.

However, there was much confusion about how the two levels that OrgPlan offers (Farm gate and enterprise level nutrient budgets) which may in part be related to a mistake in the assumptions for the N fixation for legume crops, which has since been corrected.

Further improvements of the enterprise level nutrient budgeting function could be achieved by considering farmyard manure distribution. However, this needs careful investigation and is likely to be more complex than the current round of testing can accommodate.

Key discussions about the financial budgets

The workshops confirmed that financial checks of the feasibility of a conversion are currently not commonly taking place during OCIS type visits and many consultants are not familiar with type of work.

Given the increasingly difficult financial situation of many farms this would be desirable and OrgPlan could help to fill this gap. However, some concerns was expressed as to whether OrgPlan creates the false impression that it can deliver cash flow forecasts for the bank manager without the need for further input of detailed data and possible the help of a financial consultant. This clearly is not the intention of OrgPlan and the presentation of the financial results has since been reviewed. Some revision will be carried out before release, but not all points can currently be addressed.

Short report of each workshop

In the first workshop in Aberystwyth with consultants working with organic farms under Farming Connect in Wales (jointly with OCW) the participants were making positive comments about the level of detail that OrgPlan can accommodate in planning organic conversions, but raised the need to evaluate whether the regulatory situation of Wales is represented appropriately in EMA, which is being addressed for the 2003 edition. There was felt to be a need to clarify what farm gate and rotational/enterprise nutrient budgets do.

Based on the experience from the first workshop more emphasis on the presentation was given to the concept whole farm nutrient budgets at the 2nd workshop with OAS consultants at EFRC (19/02/2003). It was discussed that the function of the nutrient budget is very welcome and may take on a life of its own, as it becomes more and more important from a regulatory point of view. Rotational budgets could be enhanced by considering farm-yard manure distribution the suggestion was made to explore the possibility integrate the manure application tool developed by ADAS with the software. It was highlighted that the situation regarding conversion aid payment is changing with continuous Organic Farming Payments becoming available.

We also discussed that adding a proper organic ESC database that has all nutrient values for all the main outputs/inputs may be a good thing.

General points raised in the main discussion at the third workshop in Edinburgh (10/03/03) with SAC researchers and consultants were the assumption of the N-fixation values for the enterprise budgets which appear to produce some strange results. The SACO consultants also were interesting in the question how the value of the nutrient budgets at the field level could be enhanced by including the distribution of manure. It was pointed out that EMA 2002 has does not cover Scotland and the postcode feature does not work. This will be addressed in EMA 2003. The consultant expressed concerned that the profit and loss and cash flow forecast might create the impression that OrgPlan would fulfil bank managers requirements as such and some shortcomings on the presentation of the financial data. The layout has since been checked with an expert and suggestions for improvement are included below.

In addition to the workshop with consultants OrgPlan was introduced at a regular event (21/01/03) with the farmers participating in the organic field scale vegetable conversion project of HDRA (DEFRA OF 0???) This was not directly related to testing programme but some interesting issues were discussed. Given the limited time available we decided on a focus on rotation planning. The main issue discussed was whether or not organic standard enterprise data should include routine P and K applications, so that nutrient off-take of each crops cannot be seen clear. In the draft enterprise database used for testing P inputs are included in all in-conversion and organic cropping enterprises on the basis of an assumed rotational application. K is included in organic and in-conversion root and vegetables enterprises.

The point that the time interval check in the rotation does not consider crop families, e.g. such as crucifers, alliums etc was also raised at the workshop.

3 Consultants detailed comments: General use of the software

3.1 Experience with learning how to use the software

Several consultants considered themselves as not very experienced computer users. They commented that they found it at first rather difficult to get to grips with the OrgPlan layout, how the various sections of the software operate, and how to navigate around it. Some would have liked to have even more training in advance.

The "show-me" was considered useful, but some found confusing that this function asks for a connection to the internet. They had obviously not taken in the information given at the training that this can be bypassed without problems.

3.2 General problems reported

Very few general problems were reported:

- Several people commented on the data entry being a bit long winded, with double clicking, cells being too small etc.
- The software has no printing options for charts, when they are printed this is basically a screen dump to the default printer. This means that it is not possible to alter the set page up (landscape/portrait etc), or choose a different printer (particularly in networks). *This could be changed by incorporating the chart into an HTML report, but this would require more time for development than currently available (rating 3).*
- There are no categories for the valuation of livestock and quota in the farm profile and investment section (see section on financial reports).

3.3 Software errors

Very few actual errors were reported, which have been included in the specific sections below and have now been fixed.

3.4 Usefulness for conversion planning

The feedback in the workshops was generally positive, and the tool was considered potentially very useful in supporting conversion planning, and for farmers to explore different options.

The initial testing was largely with consultants experienced with conversion planning. However, one participant without such experience felt that users need some knowledge about the planning process, before they can make full use of the software. One participant who tested without the training day also appeared not to have identified all features of the software. Future training after the release should address those issues.

3.5 Strengths as identified by the consultants

- Financial planning
- Incorporates economic data with physical entries of enterprises
- Quicker to do budgets once rotation is worked out and stocking numbers calculated
- Broad brush stroke planning, particularly for farms planning new enterprises
- Good idea to include both financial and nutritional information in one package
- Illustrating the benefits or otherwise of different enterprise combinations both in terms of physical and financial data
- Allows to 'tweak' the system without having to re-define everything
- Library, navigation around this collection is excellent.
- Rotation planning and nutrient budgets was useful
- Help topics clear and straightforward
- Very useful to have basic enterprise data available resulting in much quicker assessment of various scenarios
- Ability to create and save different scenarios giving instant access for reassessment of options
- The summary info from the handbook in the advisory section

3.6 Weaknesses as identified by the consultants

- Takes time to get going, very complex, confusion over setting up, use of databases etc.
- Limited range of enterprises in the database, particularly for horticultural crops and for stockless arable rotations.

- The assumptions are not always clear, e.g. fertiliser applications as a matter of routine in all organic root crops, some of which can greatly alter the outcome of an exercise.
- Will need to be updated with new data – prices, premiums etc regularly
- Fertilisers routinely included in organic enterprises
- Transfer of data from database appeared to very slow although on balance it was still quicker than doing the exercise by hand
- Difficult to work out how to change prices in the enterprise data to illustrate sensitivity of scenarios to price changes.
- Requires thorough training in how the system operates, how you enter and change data, mouse attributes, F keys and data selection for the programme.

3.7 Time needed to plan one farm scenario

Most consultants had to learn the software as they were testing it and were therefore not in a good position to comment on this. Most felt that it took quite long at first (up to one day) but expected that data entry would be faster, once they were more familiar with the software layout.

Those that stated time reported that it takes approx. 1 to 2 hours for the data input for one farm, depending on the number fields, the length and complication of rotations and the level of detail of the planning.

3.8 Potential use for other whole farm planning

It was felt that OrgPlan could be useful for whole farm planning of other organic and conventional farms, but for the latter more work would be need done to expand the conventional standard data section and that the graphical presentation of the data could be improved.

3.9 General suggestions for further improvement from the consultants

- A need to evaluate whether the regulatory situation of Wales is represented appropriately in EMA. *This issue is being addressed for EMA 2003.*
- Extend database section for broader application, whole farm organic farms, and further conventional data. *It might be possible to explore collaboration with a provider for conventional data in the future.*
- Include more examples of scenarios could be used as demonstrations for farmers considering their conversion. *The demo-farm example will be replaced with a realistic scenario, further examples (such as those given in the OCIS brochure) model can be added, but require more work to set up.*
- Allow for continuous Organic Farming Payments: As maintenance payments are about to be introduced. *There clearly is a need to consider this in the future and this may not be too difficult to implement (rating 4). However, the user currently can enter the amount under the whole farm finances section as Income.*
- Improve the data entry, replace the write click of the boxes in order to edit, with just moving to the box. *This can be done but requires a lot of work (rating 3).*
- Scan in a map of the farm so that particular fields could be selected. This might help, with colour coding to visualise the amount of different crops being grown in different years. *This is, however, very difficult to implement and would be a significant project on its own (rating 5).*
- Edit-Undo command on the menu. *Again this is difficult to implement (rating 5).*
- Speed up the crop data entry by grouping the crops into categories rather than having to run through the list of ALL crops. *Consultants can customise their databases, but this would require a substantial amount of work (rating 5)*

4 Standard data section

4.1 Experience with viewing and editing standard data

Overall most found this section quite straight forward, apart from initial problems with loading the OrgPlan standard data.

Several consultants reported problems with remembering which database they were using, what changes they had made, particularly after working for a while on enterprises without going back to original database and some suggestions were made to overcome this (see below).

In relation to the nutrient budgeting function the inclusion of some organic inputs (P and lime application as standard, K application to root crops) was discussed in the workshops and commented on in some reports. Consultants found this confusing and potentially misleading for the nutrient analysis, and also because it creates the impression that the use of such inputs (Potassium Sulphate) is routinely practised, event if they may be restricted in the organic standards.

4.2 Problems encountered

Some consultants encountered problems with loading the OrgPlan data-base, an issue that needs to be explained in a document about the set-up.

Frequently we had problems explaining the difference between the farm-level and field level nutrient values at the workshops and *will include a little more explanation about this in the step guide.*

One had problems with copying with one vegetable enterprise and re-naming it, but this would not be possible anyway as the enterprise type would need to be changed for a different crop.

4.3 Software errors

One consultant had a problem in overwriting an enterprise database file. *This error needs to be checked but should be relatively easy to fix (rating 1).*

4.4 Data errors

No further data problems reported, apart from those identified in the workshops: double representation of K fertiliser in organic potatoes (*already corrected*) some errors in nutrient values (*will be checked again*).

4.5 User friendliness of the section

Most consultants found this to be good and the format derived from the Organic Farm Management Handbook to be familiar and user friendly apart from general comments about data entry. One commented on the difficulty in knowing ME, NPK values for all inputs/outputs.

4.6 Suggestions for improvement from consultants

- Separate ESC database with NPK content and costs etc of common amendments used including FYM on organic farms (*will be added*)
- Check enterprise names because set-aside refers to a subsidy regime rather than a crop which is red clover (*some adjustments will be made in the database, but changes are not restricted because sample rotations refer to the names*)
- Suggestions for additional data sets (*we will include some for which we can find data, but for many no reasonable source of data has not yet been identified*)
 - more horticultural crops (*cannot be added without data sets*)
 - grazed white clover/grass (other years) *added*
 - permanent pasture with less than 21% clover (*10% clover added*)
 - permanent pasture under conventional management (*exists already*)
 - rough grazing (*drafted based on HFRO, 1979*)
 - more crops for stockless arable rotations, such as crops for fertility building and for winter green manures
 - Grazed set aside (as under new rule, *added organic and in-conversion only*)
- Further differentiation of 'In-conversion' status depending on whether or not there is a market for in-conversion crops (*The developers assume that users can customise their own databases to reflect this*).
- Display the name of the active database in the Central Resources Section in a more prominent position. *Will be done (rating of 1)*
- Option to maximise window with the enterprise details. *Can be done (rating of 3)*
- Option to print "other details" apart from GM report, such as *Nutrients or other properties* and balances at the bottom. *Can be done (rating of 3)*
- Allow to keep better track of changes to values through (a) Colour coding of own entries, (b) option to 'return to/ compare with default' values (c) a prompt when changing data. *Can be done but is very difficult (rating of 5)*
- Use the colour coding to distinguish the status of inputs/outputs i.e white (conventional) yellow (in conversion) and green (Organic) *This is difficult to as the colour coding is already used within the module to distinguish between outputs and inputs. To change it would probably involve re-writing the entire module (rating of 5).*

5 Rotation planner

The tool was generally found quite straight forward and very useful. Particularly the function to see the nutrient implications of certain rotations was found to be very useful. However, the difference between farm-gate and field level nutrient budgets and why FYM is not included did cause some confusion, illustrating the organic consultants are not routine using nutrient budgeting at the moment, no standardised approach on how to do does yet exist.

5.1 Experience with viewing existing and creating new rotations

Generally found easy to do.

5.2 Problems encountered

- Two successive years of clover are treated as clover 2 separate crops and therefore gives a warning that the interval is not long enough (*to be checked*).
- Length of time for onions, potatoes and brassicas are specified in the Soil Association standards (Section 2.04) as 3 years, rather than the period in OrgPlan. (*will be adjusted*).
- For many crops in the list ("crops best followed by") they are no enterprise data so they can not be included.
- Poor labelling of graphs, especially if they are printed out. *This is limited by the control used within VB to create the charts.*
- Confusion about the nutrient status. *These were largely related to the errors we identified in the N budgets.*
- Some problems with data entry, double clicking, plus and minus buttons etc.
- Some problems with inappropriate warnings etc.. *These were related to not finding crops in the list, e.g. people did not find the set-aside as a fertility building crop.*

5.3 Software errors

One small error was reported that has now been fixed.

5.4 Comment on sample rotations and rotations rules

- Some examples were felt not to be relevant to the UK as a whole, but users found it easy to make up their own. *An additional beef and sheep rotation will be included.*
- The warnings were found to be handy and useful for someone with limited knowledge of planning a rotation.
- It is not clearly explained what the NPK bars are showing.

5.5 User friendliness of the section

Those that commented found it quite easy and straight forward to use.

5.6 Suggestions for improvement from consultants

- Relabel UP and DOWN arrows in the multi-crop selection box as "add crop" and "remove crop" for clarity. *This can easily be done (rating 1).*
- Check interval warning for 2nd years of clovers (*will be done*)
- Include printing option that allows printing all details, such as warnings, nutrient balance etc. *Can be done (rating of 2).*
- The "crops followed best by" bit should be left empty for permanent pastures, as this creates the impression that they can be ploughed, which clearly should not be the case. Can this be changed? *This could be possible to implement by changing the rules database (rating 2). However, this would also initiate a warning should the user construct a rotation in which permanent pasture was followed by any other crop, but given the growing restriction on this in agriculture as a whole this would be appropriate.*
- Set default status of the crops in the rotation should be organic rather than conventional (*can be done (rating of 3)*) or to include a prompt to remind that status needs to be set (*can be done, rating of 2*).
- Flag warnings for crops families, such as brassicas, alliums etc. *Can be done (rating of 3).*
- Quick jump to enterprise database from rotation planner (similar to other properties in scenario planner) so that new enterprises can be added or enterprises can be edited. *Can be done, but not easy (rating of 4).*

One horticultural consultant saw it as a missed opportunity that estimates of nitrate leaching have not been included and that the potential role that over-winter green manures could play in retaining N in an organic system can not be demonstrated. In his opinion it is one of most common errors that converting farms make (arable/veg rotations) is to under-estimate the importance of N conservation. The comments highlight the uncertainty that exists in relation to nutrient management, particularly in relation to horticulture. However, the developers feel that this area is outside the original intention of OrgPlan which was not meant to be a tool for nutrient management alone. To include this area would require collaboration with others working in this area (e.g. the MANNER programme, new DEFRA project on soil fertility on organic farms) would need careful thought as over simplification could lead to misleading estimates for N leaching.

6 Farm profile builder

6.1 Experience with entering a farm profile

Most consultants found this also quite easy to use and one in particular liked the link to the postcode, although one comment suggested that not all participants were clear what the implications of using a wrong postcode are.

6.2 Problems encountered

- Not possible to enter a negative opening balance. *This will be fixed (rating 1).*
- When more than 12 fields the table doesn't automatically scroll down when entering new data, so this has to be done manually for each line, which is awkward. *The developers consider this to be a nuisance rather than a real problem.*
- There is only one year for livestock data, compared with two for crops. *This can be changed, but does have lots of knock on effects in (rating of 4). As an immediate solution labelling of this one year should be brought in line with the field section.*
- In the field section selecting crops for 'previous' or 'current' that do not have data in the enterprise database selected will give incorrect calculations e.g. for stocking rates. *This is a general problem of the software that we are aware of but not able to correct at the moment.*
- No valuation section for livestock and quotas (*see financial sections below*)
- One reported problems with multi-cropping: the farm size is increased .g. two crops in a 10 ha field will increase the area by 10 ha, *but the problem could not be replicated by the developers.*

6.3 Software errors

None reported

6.4 User friendliness of the section

Overall considered good, apart from the specific problems identified above.

6.5 Suggestions for improvement from consultants

- Highlight the "active" farm profile in some way. *Will be done before release (rating of 1)*
- Prompt to remind the user to set the status for the fields. *Can be done (rating of 2)*
- Different ways to activate the edit mode, other than double clicking and having to press enter at the end. *Can be done but a lot of work (rating of 3)*
- Include warning if enterprise is entered for which no data are available. *Can be done but not easy (rating of 3)*
- Make it easier for non-typists to correct errors, such use of delete key. *This is difficult to implement (rating of 4).*
- Include a quick check for the floor space requirements for each species as laid down in the standards (similar to the field entry section) in the farm profile. This can be done, but would entail alterations to the storage database and would also require the development of assessment and reporting routines to compare the capacity available to that required based on livestock numbers (*rating of 5*).
- Improve financial section through adding valuation section for livestock and quota, including annual estimated value for a) personal drawings b) interest on existing loans and value of own land (*see financial reports below*).

7 Scenario creation and planning

7.1 Experience with creating and planning scenarios

This was found to be fairly straightforward once familiar with the program.

7.2 Problems encountered

- Splitting fields seems to cause problems for several people (the cropping plan before the split was adding up the fields to less than 100%; it was double counting the field area before the split and the areas of the field after being split; did not allow unequal sizes between the splits) *One problem has now fixed. However, if no crop has been assigned, sizes will add to less than 100% and when the user is multi-cropping on one or more the fields this can add up to more than 100%.*
- After the F2 or F3 key (to set the in conversion or organic status) had been hit, the software goes back to the first field & year option rather than staying on the field & year just set. *This could not be replicated, user may refer to setting the status of a selection of fields/years, in which case the software will always return to the first cell selected in the drag and drop selection process.*
- Problems with editing the field size in the cropping planner *which his is not meant to be possible anyway.*
- Changes made to enterprise databases occasionally did not appear to appear in the scenario creation section. *This is may be related to using different enterprise databases in the central resources and scenario creation process.*

7.3 Any software errors

Consultants had a problem attempting to open a file that did not exist. *This will be solved through error trap.*

7.4 User friendliness of the section

Reasonably user-friendly, apart from some problems and frustration with the data entry.

7.5 Suggestions for improvement from consultants

- Include a more realistic example of a scenario to look at with the software. *A demo-farm was already installed, but this will be replaced by a more realistic scenario of an organic conversion.*
- Include examples of scenarios to illustrate the impact of conversion on farms of different type. *Examples similar to model calculation in the OICS brochure could be included, but this is outside the timeframe agreed at the moment.*
- For staged conversions it would be good to include a summing up of the land area that is conventional, in-conversion and organic in the feed-back section. *may involve lot of work (rating of 4)*
- Include checks whether status assignment is feasible and conforms to standards, i.e. organic status can only be entered after 2 years of 'In-conversion', so that the user is warned if she or he prematurely assigns organic status to a field. *A nice idea, but given the overall assumption of an informed user not a high priority and very difficult to implement (rating of 5).*
- Include edit 'undo last action'. *Also raised as general points, extremely difficult to implement (rating of 5)*

8 Scenario feedback

Those that commented found this section quite clear and very useful to get a quick feedback once a scenario has been created.

8.1 Reliability of calculations and correspondence with own estimates

8.2 Area in hectares and percent

Found to be functioning o.k, no specific comments.

8.3 Gross margins

Found to be functioning o.k., no specific comments.

8.4 Forage budget

One consultant found the output (in ME) a bit too academic, as farmers don't use this for forage planning and suggested to re-convert the value into tonnes of silage.

8.5 Nutrient budgets

The workshops and reports highlight that consultants at large are not familiar with the concepts with the farm gate nutrient budget. They are not routinely included in conversion plans, and there is no common approach on how to do it and consultants did not instantly understand what the charts were showing.

There was some discussion about the value of farm gate budgets. It was highlighted that this clearly does not illustrate the weaknesses for individual fields, only for the scenario as a whole, but more detail for each field would be needed to make the option of field analysis work more accurately. However, many found the option to illustrate the impact of rotations and scenarios on nutrient flows very useful.

After testing with known examples the developers identified some errors in the N-budgets. The main problem in the farm-fate budgets is related to the fact that proposed fixation factors (Korsath and Eltun, 2000) do not consider N fixation under ground and that the source did not provide factors for all legumes likely to be considered by OrgPlan users. The following table summarises the corrected fixation factors collated from a range of sources) and the N crop residue factors have been adjusted to reflect the below ground fixation values (Joergensen and Ledgard, 1997). However, it is important to note that several of these are the developers' estimates and are not supported by specific research.

Parameter values for the N-fixation formula (Table 23 in OrgPlan Manual)

Nleg (%)	Fixation N	N Crop residue factor		Legume
		Year 1	>Year 2	
4.7	0.9	1.7	1.5	White clover
3.0	0.9	1.7	1.5	Red clover
3.3	0.9	1.7	1.5	Lucerne
3.1	0.8	1.5		Trefoil
3.1	0.8	1.3		Vetches
3.3	0.8	1.3		Tares
2.5	0.8	1.3		Lupines
4.3	0.8	1.3		Field beans
3.4	0.8	1.3		Field peas

8.6 Stocking rates

This was found to be very useful, but an explanation of what the colour changes means is needed. *An explanation of the trigger level will be included in the General section of the software options window (rating of 1).*

8.7 Suggestions for improvement by the consultants

- Titles on top of the three charts in the balancing section would be useful and better labelling of the charts to be printed. *However, the chart control tool used to create these in VB is fairly limited and in this instance it is not possible to force it to display labels and titles due to the size of the chart, but a note will be included in the step guide.*
- Re-convert ME values into tonnes DM of forage (e.g. silage) through the use of a standard value to make this to be easier understand by farmers. *Can be done, but not easy (rating of 3)*
- Consider proportion of feed from organic and in-conversion status in the forage budgets. *This is considered to be helpful and should be explored further in the future.*
- Improve the value of nutrient analysis on a field level through the inclusion of manure availability and sufficient fertility building so that more representative budgets for individual fields could be drawn up. *This is considered to be helpful, but requires more work to find out how it could be done.*

9 Whole Farm Finances and Investment Planner

Many consultants stated that they are not commonly involved in financial advice, and they did not comment in detail on this section.

9.1 Experience with entering whole farm data

Interest payments on existing loans would need to be entered for every year which is a bit long-winded. An alternative option would be to include them in the farm profile builder as an estimated annual value or to include an empty field automatically as a reminder that such data need to be entered.

There is no category to enter the data for personal drawings. *This will be added and included in the cash flow forecast.* Again, an alternative would be an entry section in the farm profile as estimated annual value.

9.2 Experience with using the investment planner

One consultant would prefer to use percentage rather than total value to estimate repair and maintenance costs, but others were quite happy with the layout, so no further action will be taken at the moment.

No possibility to account for investment in breeding livestock and quota. *This should be explored in the future.*

9.3 Software errors

None reported.

9.4 User friendliness of these sections

There seemed to be the opportunity to record a lot of information, but some felt that this may already be done by other means and that financial consultants would have other tools to produce cash flow forecasts.

9.5 Suggestions for improvement by consultants

- It might be good to look at labour peaks and troughs throughout the year. *This is an interesting idea, and indeed labour budgets were part of some spreadsheet based planning programmes that we looked at early in the development. However, there is no catalogue of standard labour data for organic farms/enterprises in the UK that could be used as a basic data set and without reliable data this is difficult to implement.*
- Add valuation sections and data entry categories for breeding livestock and quota in farm profile/investment planner (*see below*).

- Can the certification costs be included automatically? (*A nice idea, but given the complicated fee structure of 16 certification bodies this appears impossible to implement*)

10 Financial reports and data export

Because some consultants that are involved with financial advice felt uneasy with the Profit & Loss and the Cash Flow reports, that the software would create a false impression of accuracy that it can not deliver, the layout was discussed again with a farm management lecturer at IRS, and his comments are included in this section.

10.1 Profit and loss report

Very few comments apart from the need to include interests on existing loans in the P&L calculation. *This item can already be considered, by entering interest payments in the whole farm finance section.*

10.2 Cash flow

The current layout does not include an estimate for "Personal drawings" under payments each year. *This will be included to get an accurate closing balance that can be carried over to the next year.*

10.3 Investment

Straight forward, no further comments.

10.4 Detailed cash flow

Personal drawings as above. One consultant commented on finding it very difficult to enter the dates in this section, another found this section to be too complex to be useful.

It is likely that experienced financial consultant would know what to do with the information that is provided, so it is largely a resource, rather than a direct output of OrgPlan and should be re-labelled cash flow data.

10.5 Gross margin reports

Fund to be very useful.

10.6 User friendliness of these sections

Overall, the report layout was found to look good. It appears that P&L forecasts and gross margin reports were found to be most useful at this stage, whereas cash-flow should more be viewed as a resource for more detailed analysis of data that experienced consultants may want to carry out.

10.7 Suggestions for improvement for consultants

- There was one suggestion to include further headings in the detailed cash flow data to make it more user-friendly.
- Would be nice to be able to put in certain scenarios like 10% drop in prices etc, or random 10% crop failure.
- Add an extra box labelled "estimated personal drawings" to the farm profile, possible under the opening balance.
- A negative cash flow balance could automatically attract further interest payments.
- Include a simple balance sheet into the programme in future would add more credibility and accuracy to the financial forecasts. Bank managers would ask for (or draw up) a balance sheet to assess such an investment, alongside a P&L forecasts, and a detailed cash flow for no more than three years ahead, with longer detailed forecasts considered to be too unreliable anyway. Such a financial balance sheet would need to cover all assets (i.e. machinery, buildings, land, livestock, quotas) and all Liabilities (bank loans, overdrafts and personal capital).

To include this in OrgPlan we would need to:

- 1) include a value per ha on the land owned,
- 2) include value section for existing buildings (this could include a check on size for floor space requirements)
- 3) include a valuation section to the livestock by adding a value per head for the stock which can be multiplied with the number of stock
- 4) include the value of quotas (i.e. the number of animals/kg of milk for which different types of quota are held) and a value per quota.
- 5) include a section to record existing loans.
- 6) design a balance sheet report

All these suggestions are relevant and suggest that the financial report section could be revised again to make it more user-friendly, but this is outside the current time limit.

10.8 Additional suggestions

GM reports

- A unit (kg/No) will be included in input column in enterprise report (*rating 1*)
- Move the tab further to the left, e.g. before P&L report *Can be done (rating 2)*

- Quick jump from here to edit enterprise data as errors or missing data are often spotted at this point and returning to the entire scenario takes a long time. *This would be difficult to implement and would probably be no faster than returning to the entire scenario because if changes are made to enterprises everything needs to be re-calculated anyway (rating of 5)*

P&L report

- The tab and printouts will be labelled clearly as "P& L **Forecast**" (rating 1)
- The note that all P&L forecast are pre-tax should will be included on all reports and printouts, charts etc.. (rating of 1)

Cash Flow

- The tab and all reports/printouts should be labelled as "Cash flow forecast" *Easily done (rating of 1)*
- Let calendar to assign dates appear after right click on mouse to select date rather than have to go to the top of the sheet each time. *Date pickers are always quite difficult to get working in a user-friendly way (rating of 4).*

Detailed cash flow data

- The tab should will be relabelled as "Detailed cash flow **data**" (rating of 1)
- The chart is meaningless unless the dates have been entered. *We will include an appropriate warning that it only shows a realistic picture once dates and other payments have been entered correctly.*

11 Summary

11.1 Action points implemented before release	Section above	Who
General use of the software		
Include some form of training in the marketing concept	2	SP✓
Add some more explanation about the layout and the different section of the software in the step guide (done)	2	SP✓
Enterprise data base section and tool		
Problems with overwriting an existing file	3.3	JT✓
Errors in some nutrient values	3.4	SP✓
Problems with N fixation factors	7.5	SP✓
Remove fertiliser use from organic/in-conversion data set	3.6	SP✓
Explore which new enterprises can be added	3.6	SP✓
Organic ESC database including farm yard manure	3.6	SP✓
Display the name of the "active database" in the Central Resources Section in a more prominent position.	3.6	JT✓
Re-label arrows in multi-cropping option as "add"&"remove" crops	3.6	JT✓
Rotation planner		
Check interval warning for 2 nd year clover	4.2	JT✓
Adjust Interval for onions and potatoes to come in line with SA standards to three years to bring it in line with the SA standards: add to the text in the warnings to make this clear (" as specified in Soil Association standards)	4.2	JT✓
Include additional rotation example for beef and sheep	4.2	SP✓
Farm profile builder		
Allow negative opening balance	5.2	JT✓
Change labelling for year entry in the livestock section to bring in line with crops.	5.2	JT✓
Highlight the "active" farm profile in some way.	5.5	JT✓
Scenario creation and planning		
Stop users from creating "empty" rotations	6.3	JT✓
Error trap to stop user from attempting to open a file that does not exist	6.3	JT✓
Include a more realistic demo-farm scenario	6.5	SP✓
Scenario feedback		
Explanation for stocking rate colour change <i>in</i> the General section of the software options window	7.6	JT✓
Remaining check of N fixation calculation for legumes, using feedback from SAC on residue factors	7.5	SP✓
Include note on which graphs are shown in the balancing section in the step guide	7.7	SP✓
Whole farm finances		
Data entry category for personal drawings	8.1	JT✓
Financial reports		
Take away as personal drawings as payments each year in the cash flow and detailed cash flow reports	9.2	JT✓
Include unit (kg/No) for input column in enterprise report	9.9	JT✓
Label P&L tab and printouts clearly as "Profit & Loss Forecast "	9.9	JT✓
Include note that all P&L forecast are pre-tax on all reports and printouts, charts etc.	9.9	JT✓
Label cash flow tab and all reports/printouts as "Cash flow forecast"	9.9	JT✓
Label detailed cash flow tab "Detailed cash flow data "	9.9	JT✓
Include note on chart of detailed cash flow, that this shows meaningful results only once dates have been allocated and additional costs have been entered correctly.	9.9	JT✓

11.1 Summary of recommendations for further improvement

General use of the software

The testing showed that OrgPlan can support several aspects of conversion planning, but it relies on the user having a basic understanding of what the process of conversion planning involves. Parts of the testing were training workshops in how to use OrgPlan. Most consultants found this valuable and it can therefore be concluded that training courses in how to use the software should be offered after the release.

OrgPlan could have a wider application in whole farm planning, but this would require extending the database to cover a wider range of enterprises common on conventional farms.

Key strength (not in order of importance)

- Financial planning
- Availability of basic enterprise data set
- Rotation planning and nutrient budgets
- Combination of financial and nutrient data in one package
- Possibility to 'tweak' a scenario
- Create different scenarios giving instant access for reassessment of options
- Library, navigation around this collection is excellent
- Help topics clear and straightforward
- Broad brush stroke planning, particularly for farms planning new enterprises

Key weaknesses (not in order of importance)

- Limited range of enterprises in the database, particularly for horticultural crops
- Problems with set-up, use of database and understanding all functions
- Need for regular updates of the dataset
- P and K Fertilisers routinely included in organic enterprises (*have now been removed*)
- Data entry in some sections is long-winded

Key Suggestions for improvement made by the consultants

In the following sections the key suggestions that are not possible to implement before release are summarised. Please refer to the main text above for the full detail of the suggestions and the developers' comments on the suggestion and a rating in terms of ease of implementation.

General use of the software

- Combine with the use of farm maps
- Improved data entry
- Easy options to 'Delete' and 'Undo'
- Extend database
- Include more farm and scenario examples to demonstrate impact of conversion on different farm types (similar to examples in the OCIS brochure)
- Consider new developments in updates (e.g. continuous organic farming payment, changes to set-aside rules, new CAP rules etc).

Standard data base section

Because it follows the standardised format of gross margins the section is easy to understand for all users that are familiar with the any other Farm Management Handbook. Suggestions for further improvement were:

- Improve presentation of the windows and include direct printing options
- Allowing the user to keep better track of his/her own changes
- Include more enterprises, e.g. more crops from horticulture
- The use of colour coding to reflect the organic status of enterprises (as in scenario planner) and further differentiation of In-conversion enterprises, depending on whether or not products can be marketed.

Rotation planner

The tool was generally easy to use and found very useful, particularly the option to evaluate the nutrient demands of rotations. Some users were confused between the rotational and farm gate budgets. Suggestions for further improvement included:

- To set 'organic' as default status of rotations
- Direct printing options
- Quick jump to enterprise database from rotation planner
- Flag warnings for crop families (e.g. alliums, brassicas)
- Consider further issues of N-conservation and nutrient management especially in horticultural rotations

Farm profile builder

This function was also considered easy to use. The following specific suggestions for improvement were made:

- Include warning if enterprise are used for which no data are available
- Prompt to remind the user to set the status of the fields
- Improve layout for livestock section through including two year data (as for crops); include available floor space for each species and check against standard requirements.
- Allow data entry for valuation of all types of assets (see financial)

Scenario creation and planning

This tool represents the most important feature of the software. It requires the user to familiarise themselves with it's functioning at first, but was found reasonable user-friendly thereafter. Suggestions for improvement included:

- Summing up of the land area by status (*conventional, in-conversion, organic*) for staged conversions
- Include a check whether organic status of fields has been assigned correctly.

Scenario feedback

Most checks (area in ha and per cent, whole farm gross margin) were found to be useful and functioning well. Some specific comments were made in relation to the following ones.

Forage budget

Overall consultants agreed with the need to consider the issue of forage, but pointed out that farmers are not familiar with using energy values for broad forage planning. Limited research data exist about yields and ME values of a range of organic forage crops (e.g. rough grazing). Specific suggestions for improvement were:

- Re-convert the ME values into tonnes of a specific forage (e.g. silage) to make this easier to understand for farmers.
- Allow to consider the status of feed (*organic; in-conversion*) to evaluate proportions in diet.

Nutrient budgeting

There is currently no standardised approach for nutrient budgeting on organic or converting farms. The testing illustrated the potential of the farm-gate approach as an educational tool, and for assessing the need for fertilisers restricted in organic standards. However, no data for the P and K content of mixed organic feeds could be identified so estimates had to be used. Suppliers of organic compound feeds should be encouraged to include information about this (% P,K) along with nutritional values on the labels.

Both in farm-gate and rotational N budgets there greatest uncertainty lies in N-fixation, because of a lack of appropriate research of below and above ground fixation for a range of legumes and legume/grass mixtures under different conditions. Several factors for model that was used had to be estimated by the developers.

The rotational budgets could be strengthened, if the distribution of farm-yard manure and slurry needs to be considered. The compatibility of OrgPlan with other nutrient models (e.g. the manure management programme developed by ADAS) should be investigated.

Whole farm finances and financial reports

The testing confirmed that the OCIS process does not routinely include checks of financial feasibility of an organic conversion. Given the increasingly difficult financial situation of many farms this would be desirable. The consultants found the combination of financial with other planning and the whole farm gross margin and P&L forecasts report of OrgPlan most useful in this respect.

However, concerns was expressed whether OrgPlan creates the false impression that the output reports (such as cash flow) can be taken directly to a bank manager without the need for further refinement and/or the input a financial consultant. Some re-labelling of the financial reports of OrgPlan will be carried out to correct this false impression and further notes have also been added to the Step-guide. However, further improvements of the farm profile, whole farm finance and financial report sections have been identified. It was suggested to adding a balance sheet function to the financial reports that would cover the change in value of all assets and liabilities over the scenario. This would add more credibility to the financial reports generated from OrgPlan.