

---

# Knowledge representation

## Part 4

---

Step by step guide to using the software for inputting sources, statements, derivations, and purpose of 'fuzzy' search

---

# Entering sources and statements in AKT5

- Now we know how to construct a unitary statement from the formal grammar, let's see how to enter it into an AKT5 knowledge base with its associated source
-

# Entering source details (1)

Name of source

Location of interview

This can either be the actual site of the interview (i.e. in agroforestry plot) or some geographic classifier (i.e. Abreha We Atsbeha)

Interviewee

Details of an existing interview source ...

SOURCE

Name: Abay Fentahun

Location: Bila

Year: 2011

Year Suffix: a

Interviewer: Fabien Balaguer

Interviewee: Abay Fentahun

Click mouse (right button) over Labels and Gender for options.

Occupation: Farmer

Age: 42

Wealth: Rich

Study site: Dibasifatira (site 2)

DATE

Day: 15 Month: 7

Save

Memo

Gender: male

PRESS 'Save' to retain any 'value' changes

Gender

Select male or female as default settings but this can be changed by right clicking on the gender term

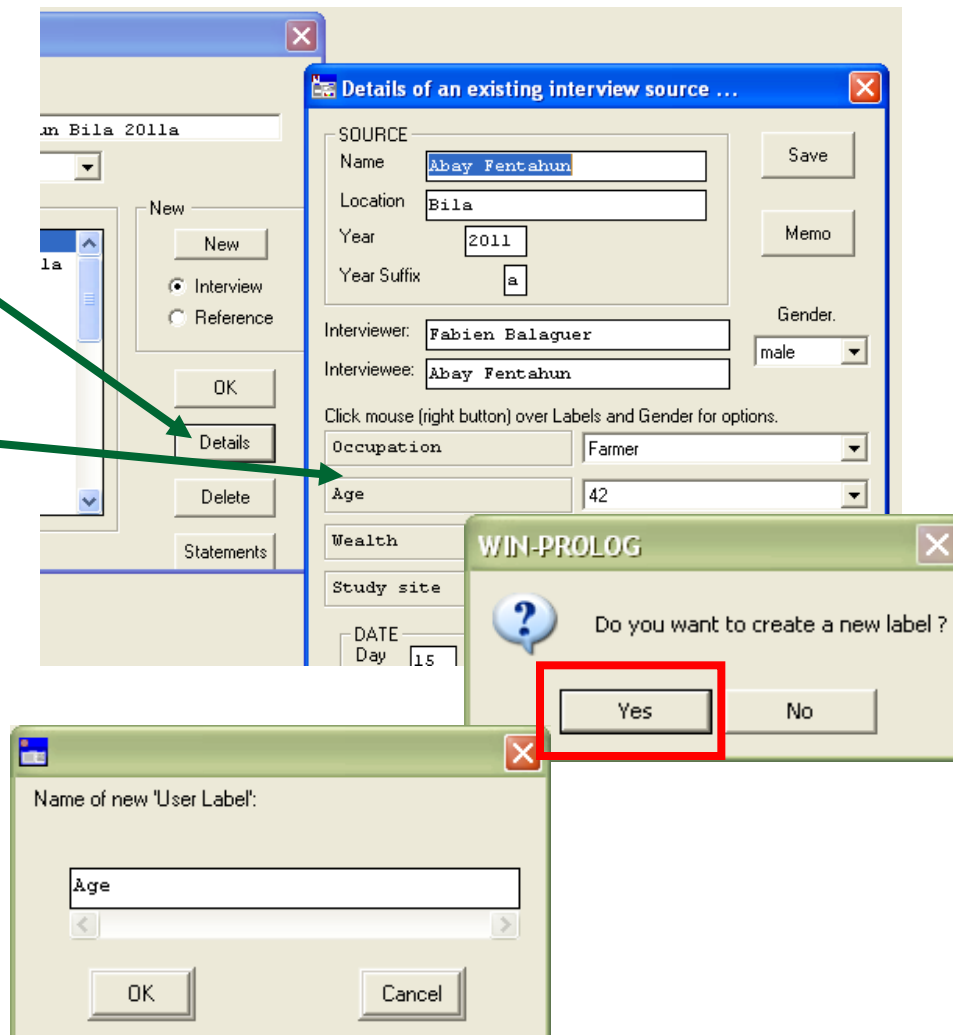
Date

Date of interview

**Then save the source**

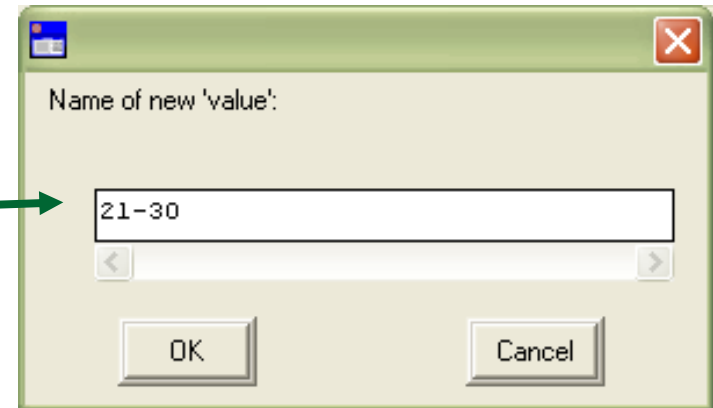
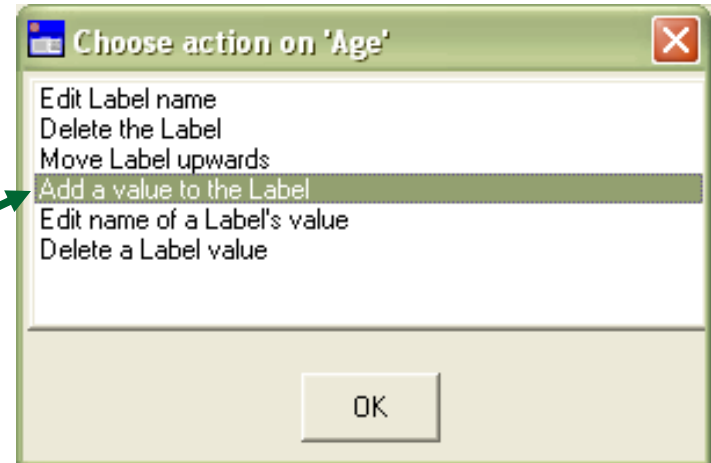
# To create a new label

- Select the source again after saving it and press 'details'
- Right click on the user labels
- Enter a new label (e.g. 'age'). This will be a default label for all sources that follow



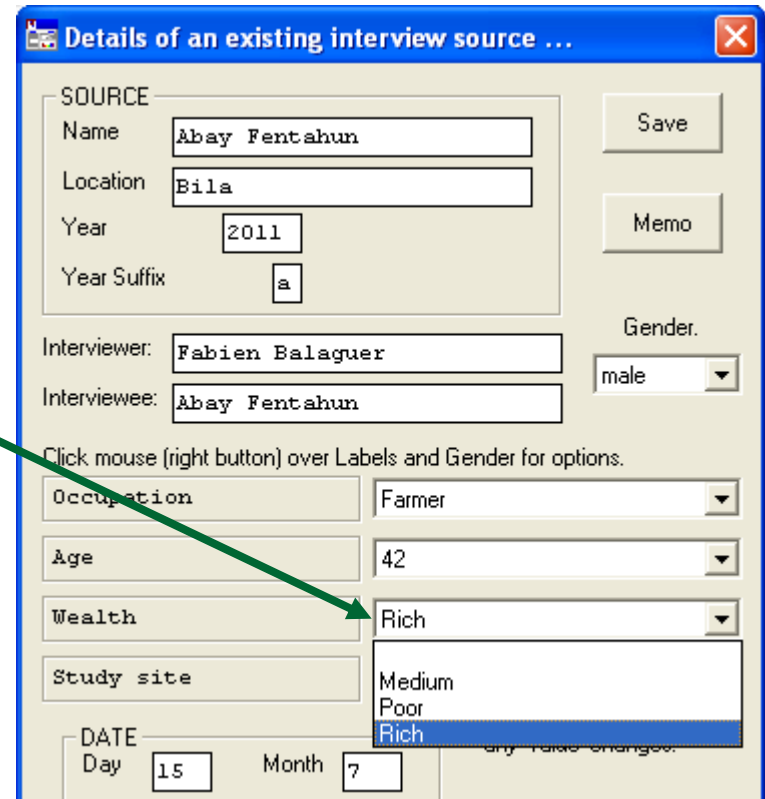
# Adding a value to a label

1. Right click on new label (in this example 'age')
2. Choose an action from the list, e.g. 'Add a value to the label' and press OK
3. Add a value and press OK



# Selecting a value from the drop down menu

- To add an existing value to an existing label
1. Select from the drop down list (default is blank)
  2. Save the source



The screenshot shows a software window titled "Details of an existing interview source ...". The window contains a form with the following fields and values:

- SOURCE**
  - Name: Abay Fentahun
  - Location: Bila
  - Year: 2011
  - Year Suffix: a
- Interviewer: Fabien Balaguer
- Interviewee: Abay Fentahun
- Gender: male

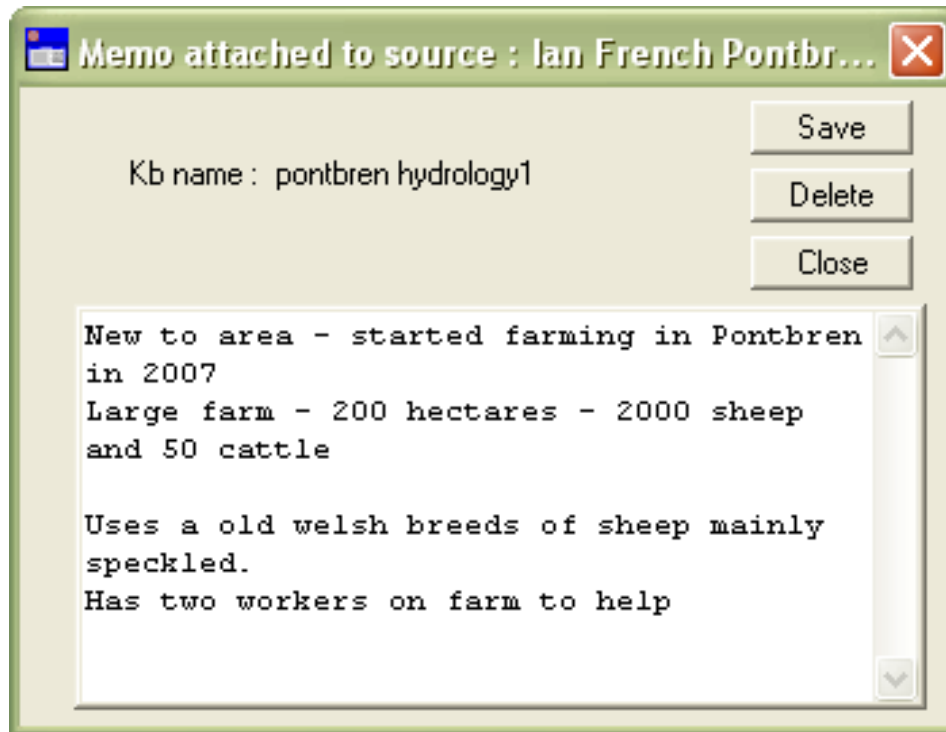
Below these fields, there is a note: "Click mouse (right button) over Labels and Gender for options." The following fields are shown with their current values and dropdown menus:

- Occupation: Farmer
- Age: 42
- Wealth: Rich
- Study site: (dropdown menu is open, showing options: Medium, Poor, Rich)

The "DATE" section at the bottom shows Day: 15 and Month: 7. A green arrow points from the text "Select from the drop down list" in the instructions to the "Wealth" dropdown menu.

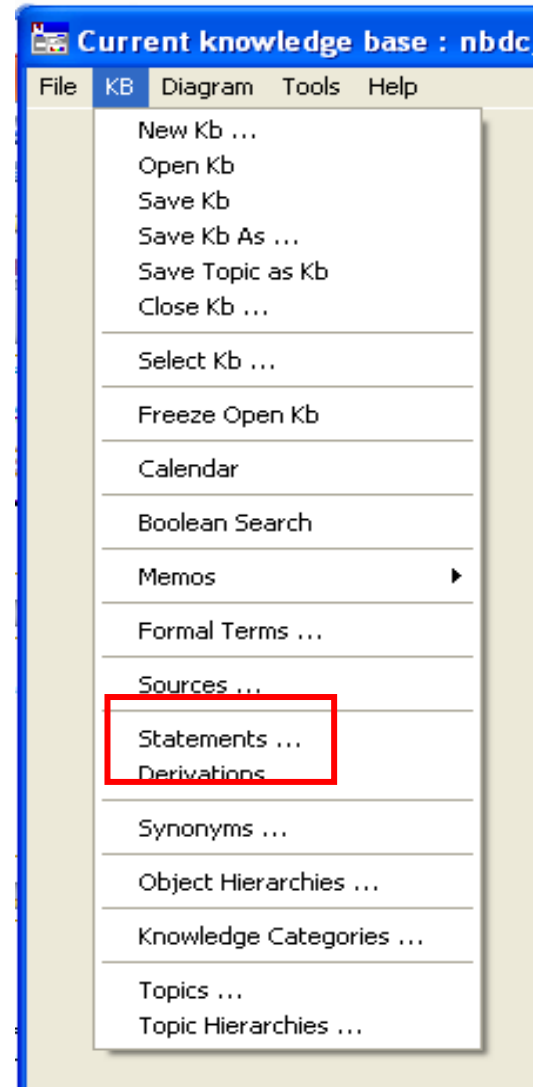
# Source memo

- You can add additional information about a source using the memo function in the 'source details' box



# New statement

- Select 'statements...' from the AKT5 main KB menu





- Select 'new'

Statements - nbdc\_fogera knowledge base.

Total number of statements : 577

Selected Statement

Natural Language

Formal Language

Numerical

Details

Edit

New

Delete

Derivations

1: the sensitivity to termites of red eucalyptus is high if red eucalypt...  
2: the sensitivity\_to\_waterlogging of red\_eucalyptus\_seedlings is high i...  
3: growing of serka\_abebe rate is fast if soils type is keyate  
4: growing of red\_eucalyptus height is tall causes the capacity of shadi...  
5: growing of red\_eucalyptus height is tall causes the capacity of shelt...  
6: the amount of red\_eucalyptus consuming soil\_water is high causes a...  
7: a decrease in level of farmlands soil\_water\_table causes an increas...  
8: the water\_content of red\_eucalyptus wood is high causes splitting of...  
9: splitting of red\_eucalyptus stems difficulty is easy causes the suit...  
10: collecting of red\_eucalyptus fallen\_leaves causes using\_as fuel red...  
11: soils type is keyate causes the likelihood of termites colonising sc...  
12: the amount of constructing gumero\_species cropland\_deadfences is hig...  
13: an increase in amount of drvino of farmlands water springs causes...

Diagram Selection Type

All Statements Causes Effects Navigate Print Statements

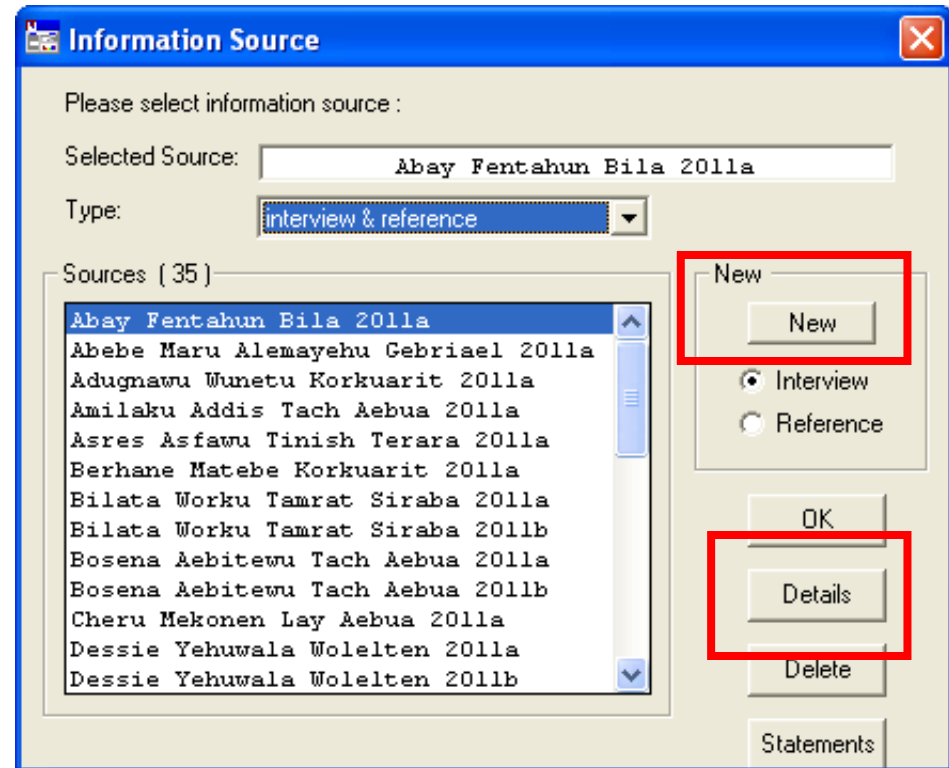
# Source details:

Either:

1. Enter a new source by clicking on the 'new' button which will take you to the source details dialog box - see below.

OR

2. Select a source from the list and press 'OK'.
  - If you want to check or edit a source - press 'details'.



---

# Derivation of knowledge

- As well as the knowledge itself we may be interested in where that knowledge has come from
  
- In AKT5 there are three default options for statements
  1. Unknown – when the origin of the knowledge is unclear
  2. Observed – based on actual observations by interviewee
  3. Hearsay – derived from interactions of interviewee with other people

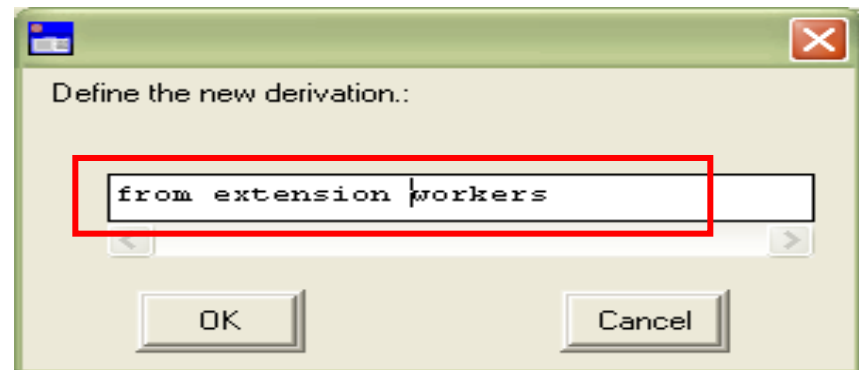
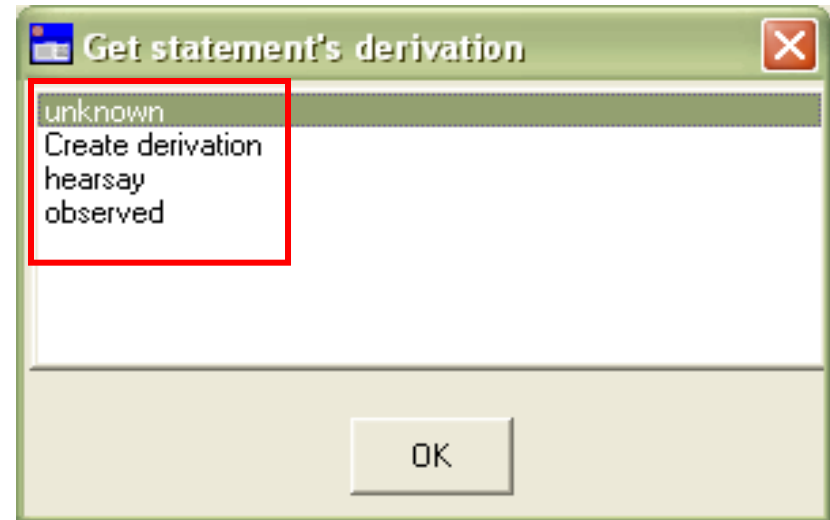
There is also the option to create new derivations

For example: Implicit knowledge, trainings, media...

---

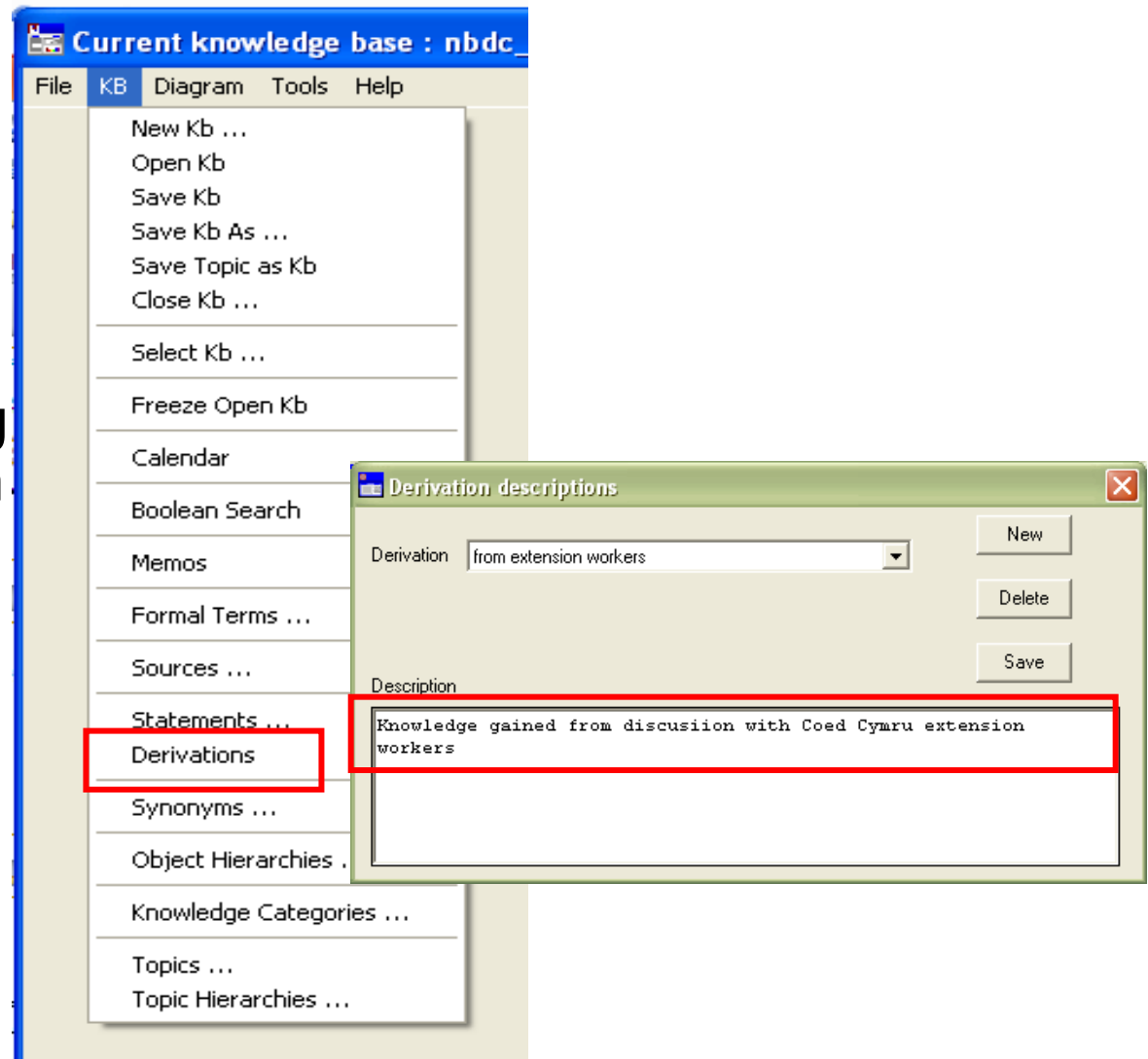
# Selecting a derivation for the new statement

- As a default you can select either: 'unknown', 'observed' or 'hearsay'  
OR  
you can create a new type of derivation.
- Select 'create derivation' and enter a name for it (e.g. 'from extension workers').
- Click on 'OK'



# Giving a new derivation a definition

- **Remember** to define the new derivation after saving your statement by going into 'Derivations' in the main KB menu.
- Select the derivation, give it a description and then save it.



# Entering a statement

New Statement - [nbdc\_fogera]

Statement No.: 773 Knowledge Base: nbdc\_fogera

Source / Derivation: (Abay Fentahun,Bila,2011,a) / from extension workers

Sources Derivation Knowledge Category

Natural Language:

Save

Formal Terms

Memo

Formal Language Statement: \*

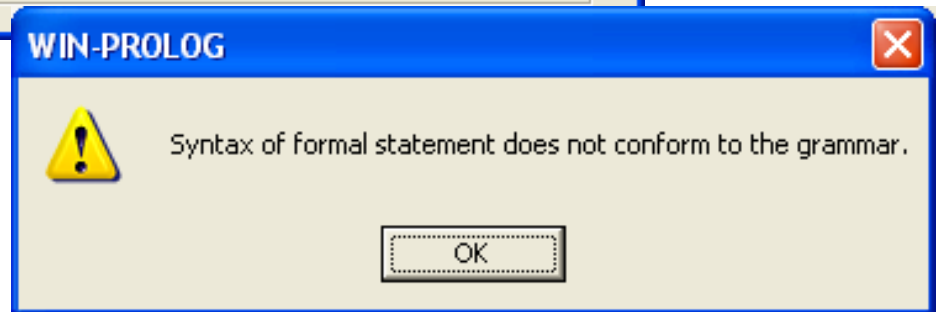
att\_value(part(eucalyptus,roots),rooting\_depth,shallow

Syntax Check

Translate

Auto grammar help

Check Syntax (to see if the statement conforms to the grammar)



\* Missing the last bracket on the statement

# Translation

New Statement - [nbdc\_fogera]

Statement No : 773      Knowledge Base : nbdc\_fogera

Source / Derivation: (Abay Fentahun,Bila,2011,a) / from extension workers

Sources      Derivation      Knowledge Category

Natural Language:

eucalyptus roots rooting\_depth is shallow

IF :

Formal Language Statement :

att\_value(part(eucalyptus,roots),rooting\_depth,shallow)

IF :

Syntax Check

Translate

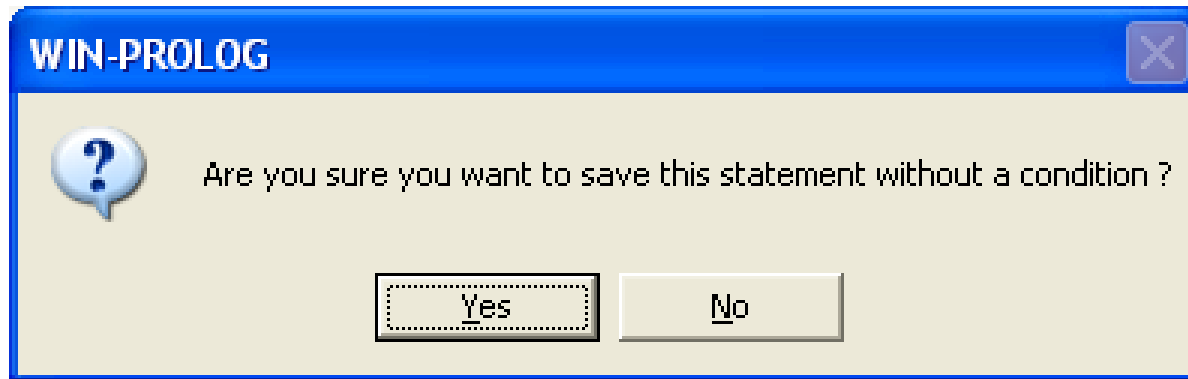
Auto grammar help

Save

Formal Terms

Memo

# Check for conditionality



- AKT5 will remind you to think about conditions for your statement when you click on 'Save'. If you do want to add a condition then select 'No' and go back to edit the statement.



# Final statement with condition

**New Statement - [nbdc\_fogera]** \_ □ ×

Statement No : 773      Knowledge Base : nbdc\_fogera

Source / Derivation:  ▼

Natural Language:

< >

IF:

< >

Formal Language Statement :

< >

IF:

< >

---

## New statements checklist

- If you have created new formal terms make sure you give them definitions (if required)
  - If you have additional information about the statement use the 'memo' function to record this information
-

---

## 'Fuzzy' search option (1)

- When entering statements, the location is often important to record
    - e.g. `att_value(action(planting,fodder_trees)),location,in_woodlots)`
  - To search for **object terms** that include prepositions there is a function within 'Boolean Search' facility to allow this
    - It is under 'Search Options' and is called FUZZY
-

## Fuzzy search option (2)

- 'Fuzzy' enables you to search an object like 'woodlots' and get the statements that contain 'woodlots' on its own as well as with prepositions attached to it
  - E.g. in\_woodlots
- This is a quicker way of searching for statements about objects because without it you would have to select each of the formal terms one by one to get all the statements

