Changes in Beehave_BeeMapp2015 in comparison to Beehave2013:

Beehave_BeeMapp2015 provides a greater number of beekeeping options. It also allows the user to read in weather files, defining the daily foraging period, which can be created by the software tool "Beehave weather". Finally, modifications of the number of adult workers and honey stores on defined dates are possible. These colony assessment file can be created with the Apple OS X application BeeMapp (https://itunes.apple.com/us/app/beemapp/id1010236321?ls=1&mt=8).

New features:
- specification of varroa treatment moved to interface
- option to have a second varroa treatment
- options for drone brood removal
- negative impact of varroa treatment on bee brood
- reinfestation of mites
- "correction" of colony state, based on real colony assessments
- option to read in weather files
- calculator of cell numbers depending on hive and frame types (interface, "Advanced Input")

New variables defined on GUI (with default values):

AllowReinfestation (FALSE):
    Switch. If "on" new mites can enter the colony on days where the weather is suitable for foraging.
BeeMapp_FILE (no default):
    Chooser. Defines the colony assessment file from BeeMapp that can be read in
ContinuousBroodRemoval (FALSE):
    Switch. If "on", capped drone brood is removed daily
DroneBroodRemoval (FALSE):
    Switch. If "on", capped drone brood is removed on RemovalDays1..5
EfficiencyPhoretic2 (0):
    Input. Defines daily mortality rate of phoretic mites during the treatment(2) period
KillAllMitesInCells (FALSE):
    Switch. If "on" all phoretic mites are killed on each day of the varroa treatment(1)
KillAllMitesInCells2 (FALSE):
    Switch. If "on" all phoretic mites are killed on each day of the varroa treatment(2)
KillOpenBrood (FALSE):
    Switch. If "on" all drone and worker eggs and larvae are killed during the varroa treatment(1)
KillOpenBrood2 (FALSE):
    Switch. If "on" all drone and worker eggs and larvae are killed during the varroa treatment(2)
MiteReinfestation (0.1):
    Input. Average number of mites entering the colony on days suitable for foraging, if AllowReinfestation is true
ReadBeeMappFile (FALSE):
    Switch. If "on" a colony assessment file, created by the BeeMapp app, is read in to correct the colony structure on days
RemovalDay1 (100):
    Input. Day of first drone brood removal, if DroneBroodRemoval is true
RemovalDay2 (140):
    Input. Day of second drone brood removal, if DroneBroodRemoval is true
RemovalDay3 (180):

Input. Day of third drone brood removal, if DroneBroodRemoval is true
RemovalDay4 (220):
       Input. Day of forth drone brood removal, if DroneBroodRemoval is true
RemovalDay5 (240):
       Input. Day of fifth drone brood removal, if DroneBroodRemoval is true
TreatmentDay2 (0):
       Input. First day of second varroa treatment, if VarroaTreatment is true
TreatmentDuration2 (0):
       Input. Duration of second varroa treatment, if VarroaTreatment is true

Variables moved to the interface:

AddedPollen_kg (0.5)
EfficiencyPhoretic (0.115)
TreatmentDay (270)
TreatmentDuration (40)

New global variables (defined in code):

AllBeeMappCorrectionsList:
       contains the data of all colony assessments with the BeeMapp app.
AssessmentNumber:
       counts the number of colony assessments
WeatherDataList:
       contains data of the daily foraging period, provided by a weather input file

Renamed:

- "Stores & hive [kg]" (plot option, interface): now called "honey & pollen stores [kg]"

Changed default values:

- GenericPlot1: "honey & pollen stores [kg]"

New procedures:

- **ReadBeeMappFileProc** (called in Setup, if ReadBeeMappFile = true):
reads in a data file of colony assessments, produced by the Apple OS X application "BeeMapp",

- **BeeMappCorrectionProc** (called by DailyUpdateProc):
 corrects the colony structure according to the data file read in by ReadBeeMappFileProc

- **DateREP** (called by "Date" monitor, GUI):
translates ticks (time steps) into the correct date

- **DefaultProc** (called by "Default" and "Version test" buttons):
sets parameter to their default values

Modified procedures:

- **Setup**:
calls ReadBeeMappFileProc if ReadBeeMappFile = true

- **ParameterizationProc**:
reads in weather data if Weather = "Weather File"

- **CreateImagesProc**:
creates a "queenless colony" sign

- **Go**:
MiteProc is called, irrespective if mites are present or not

- **DailyUpdateProc**:
takes possibility of mite reinfestation into account
calls BeeMappCorrectionProc if ReadBeeMappFile = true

- **NewEggsProc**:
show or hide "queenless colony" sign

- **Foraging_PeriodREP**:
option to read in weather data

- **BeekeepingProc:**
Moved varroa treatment specifications to the interface, option of second varroa treatment, removal of drone brood, mortality of bee brood, killing mites in brood cells, reinfestation of mites.

- **GenericPlottingProc**:
improved plotting of mites ("proportion infected mites")