



**properties:**

nitrogen fertilizer name: {urea, ammonium nitrate, ammonium sulphate};  
source of value: user;  
cardinality: single;

- The property 'phosphor fertilizer name' of the concept 'macro element' must be deleted.
- The two concepts, 'dripping irrigation macro element' and 'flooding irrigation macro element' must be deleted with their properties.

- The following concepts must be added:

**concept** tunnel;

**sub-type-of:** plantation;

**properties:**

area: numeric;  
source of value: user;  
cardinality: single;

**concept** ammonium sulphate;

**sub-type-of:** macro element;

**properties:**

ratio of N: {0.20};  
usefulness coefficient: {1.3}

**concept** ammonium sulphate schedule;

**sub-type-of:** macro element schedule;

- The following properties must be added:

**concept** calcium nitrate schedule;

**sub-type-of:** macro element schedule;

**properties:**

quantity: numeric;  
source of value: derived; /\* from tabulate \*/  
cardinality: single;  
application date: date;  
source of value: derived; /\* from tabulate \*/  
cardinality: single;

**concept** magnesium sulphate schedule;

**sub-type-of:** macro element schedule;

**properties:**

quantity: numeric;

source of value: derived; /\* from tabulate \*/  
cardinality: single;

### 3. Domain Models

**domain-model:** assessment model;  
**parts:** tuple(ESTIMATE);

**axioms:** (plant: name = bean &  
soil: salinity > 3.6 OR  
water: salinity > 2.4)  
ESTIMATE  
(plantation: cultivation capability = no)

(plant: name = bean &  
soil: salinity <= 3.6 &  
water: salinity <= 2.4)  
ESTIMATE  
(plantation: cultivation capability = yes)

**domain-model:** prediction model;  
**parts:** tuple(CONCLUDE);  
tuple(DEDUCE);

**axioms:** (plant: name = bean &  
plantation: type = open field)  
CONCLUDE  
(plantation: optimum yield = 7)

(plant: name = bean &  
plantation: type = tunnels)  
CONCLUDE  
(plantation: optimum-yield = 20)

(plant: name = bean &  
soil: salinity <= 1 &  
water: salinity <= 1 )  
DEDUCE  
(plant: predicted yield factor = 1)

(plant: name = bean &  
soil: salinity > 1 & soil: salinity <= 1.5 &  
water: salinity <= 1 )  
DEDUCE  
(plant: predicted yield factor = 0.9)

(plant: name = bean &  
soil: salinity > 1.5 & soil: salinity <= 2.3 &  
water: salinity <= 1 )  
DEDUCE  
(plant: predicted yield factor = 0.75)

(plant: name = bean &  
soil: salinity <= 2.3 &  
water: salinity > 1 & water: salinity <= 1.5)  
DEDUCE  
(plant: predicted yield factor = 0.75)

(plant: name = bean &  
water: salinity > 1.5)  
DEDUCE  
(plant: predicted yield factor = 0.50)

(plant: name = bean &  
soil: salinity > 2.3 )  
DEDUCE  
(plant: predicted yield factor = 0.50)

**domain-model:** schedule model;  
**parts:** tuple(TABULATE);

**axioms:** (plant: name = bean &  
soil: type = &  
plantation: type <> tunnels)  
TABULATE  
(micro element schedule: iron chelate quantity = (iron chelate: quantity)/2 &  
micro element schedule: zinc chelate quantity =  
(zinc chelate: quantity)/2 &  
micro element schedule: manganese chelate quantity =  
(manganese chelate: quantity)/2 &  
calcium nitrate schedule: quantity =  
(calcium nitrate: quantity) /2 &  
micro element schedule: application date = plantation: date + 30 &  
micro element schedule: advice = " ")

(plant: name = bean &  
soil: type <> &  
plantation: type <> tunnels)  
TABULATE  
(micro element schedule: iron chelate quantity = (iron chelate: quantity)/2 &  
micro element schedule: zinc chelate quantity =  
(zinc chelate: quantity)/2 &

```
micro element schedule: manganese chelate quantity =  
                        (manganese chelate: quantity)/2 &  
calcium nitrate schedule: quantity = 0 &  
micro element schedule: application date = plantation: date + 30 &  
micro element schedule: advice = "                ")
```

```
(plant: name = bean &  
soil: type =      &  
plantation: type = tunnels)  
TABULATE  
(micro element schedule: iron chelate quantity = (iron chelate: quantity)/2 *  
                                                (tunnel: area/4200)&  
micro element schedule: zinc chelate quantity =  
                        (zinc chelate: quantity)/2 * (tunnel: area/4200)&  
micro element schedule: manganese chelate quantity =  
                        (manganese chelate: quantity)/2 * (tunnel: area/4200) &  
calcium nitrate schedule: quantity =  
                        (calcium nitrate: quantity) /2 * (tunnel: area/4200)&  
micro element schedule: application date = plantation: date + 30 &  
micro element schedule: advice = "                ")
```

```
(plant: name = bean &  
soil: type <>      &  
plantation: type = tunnels)  
TABULATE  
(micro element schedule: iron chelate quantity = (iron chelate: quantity)/2 *  
                                                (tunnel: area/4200) &  
micro element schedule: zinc chelate quantity =  
                        (zinc chelate: quantity)/2 * (tunnel: area/4200)&  
micro element schedule: manganese chelate quantity =  
                        (manganese chelate: quantity)/2 * (tunnel: area/4200)&  
calcium nitrate schedule: quantity = 0 &  
micro element schedule: application date = plantation: date + 30 &  
micro element schedule: advice = "                ")
```

```
(plant: name = bean &  
plantation: type = open field &  
macro element: nitrogen fertilizer name: = urea)  
TABULATE  
( urea schedule: quantity during land preparation = (urea: quantity) * 0.25 &  
urea schedule: quantity during first month = (urea: quantity) * 0.50 &  
urea schedule: quantity during second month = (urea: quantity) * 0.25 &  
urea schedule: advice = '                '&  
urea schedule: advice = '                ')
```



```

    (plant: name = bean)
    plantation: type = open field )
    TABULATE
    (potassium sulphate schedule: quantity during first month =
      (potassium sulphate: quantity) * 0.50 &
    potassium sulphate schedule: quantity during second month =
      (potassium sulphate: quantity) * 0.50 &
    potassium sulphate schedule: advice = '
      '&
    potassium sulphate schedule: advice = '
      )

```

```

    (plant: name = bean &
    soil: type =      &
    plantation: type <> tunnels)
    TABULATE
    (magnesium sulphate schedule: quantity =
      (magnesium sulphate: quantity) * 0.5&
    magnesium sulphate schedule: advice =
      )

```

```

    (plant: name = bean &
    soil: type =      &
    plantation: type = tunnels)
    TABULATE
    (magnesium sulphate schedule: quantity =
      (magnesium sulphate: quantity) * 0.5 * (tunnel: area/4200)&
    magnesium sulphate schedule: advice =
      )

```

```

    (plant: name = bean &
    plantation: type = low tunnels &
    macro element: nitrogen fertilizer name: = urea)
    TABULATE
    ( urea schedule: quantity during land preparation = (urea: quantity) * 0.25 &
    urea schedule: quantity during first week = 0 &
    urea schedule: quantity during third week = (urea: quantity) * 0.07 &
    urea schedule: quantity during fourth week = (urea: quantity) * 0.07 &
    urea schedule: quantity during fifth week = (urea: quantity) * 0.07 &
    urea schedule: quantity during sixth week = (urea: quantity) * 0.07 &

```

urea schedule: quantity during seventh week = (urea: quantity) \* 0.07 &  
 urea schedule: quantity during eighth week = (urea: quantity) \* 0.07 &  
 urea schedule: quantity during ninth week = (urea: quantity) \* 0.07 &  
 urea schedule: quantity during tenth week = (urea: quantity) \* 0.07 &  
 urea schedule: quantity during eleventh week = (urea: quantity) \* 0.04 &  
 urea schedule: advice =' )

(plant: name = bean &  
 plantation: type = low tunnels &  
 macro element: nitrogen fertilizer name = ammonium nitrate )

TABULATE

(ammonium nitrate schedule: quantity during land preparation = (ammonium nitrate: quantity) \* 0.25 &

ammonium nitrate schedule: quantity during first week = 0 &  
 ammonium nitrate schedule: quantity during third week = (ammonium nitrate: quantity) \* 0.07 &  
 ammonium nitrate schedule: quantity during fourth week = (ammonium nitrate: quantity) \* 0.07 &  
 ammonium nitrate schedule: quantity during fifth week = (ammonium nitrate: quantity) \* 0.07 &  
 ammonium nitrate schedule: quantity during sixth week = (ammonium nitrate: quantity) \* 0.07 &  
 ammonium nitrate schedule: quantity during seventh week = (ammonium nitrate: quantity) \* 0.07 &  
 ammonium nitrate schedule: quantity during eighth week = (ammonium nitrate: quantity) \* 0.07 &  
 ammonium nitrate schedule: quantity during ninth week = (ammonium nitrate: quantity) \* 0.07 &  
 ammonium nitrate schedule: quantity during tenth week = (ammonium nitrate: quantity) \* 0.07 &  
 ammonium nitrate schedule: quantity during eleventh week = (ammonium nitrate: quantity) \* 0.04 &

ammonium nitrate schedule: advice ='

)

(plant: name = bean &  
 plantation: type = low tunnels &  
 macro element: nitrogen fertilizer name = ammonium sulphate )

TABULATE

(ammonium sulphate schedule: quantity during land preparation = (ammonium sulphate: quantity) \* 0.25 &

ammonium sulphate schedule: quantity during first week = 0 &  
 ammonium sulphate schedule: quantity during third week = (ammonium sulphate: quantity) \* 0.07 &  
 ammonium sulphate schedule: quantity during fourth week = (ammonium sulphate: quantity) \* 0.07 &



ammonium sulphate schedule: quantity during fifth week = (ammonium sulphate: quantity) \* 0.07 &  
 ammonium sulphate schedule: quantity during sixth week = (ammonium sulphate: quantity) \* 0.07 &  
 ammonium sulphate schedule: quantity during seventh week = (ammonium sulphate: quantity) \* 0.07 &  
 ammonium sulphate schedule: quantity during eighth week = (ammonium sulphate: quantity) \* 0.07 &  
 ammonium sulphate schedule: quantity during ninth week = (ammonium sulphate: quantity) \* 0.07 &  
 ammonium sulphate schedule: quantity during tenth week = (ammonium sulphate: quantity) \* 0.07 &  
 ammonium sulphate schedule: quantity during eleventh week = (ammonium sulphate: quantity) \* 0.04 &

ammonium sulphate schedule: advice =

)

(plant: name = bean &  
 plantation: type = low tunnel )

TABULATE

(super phosphate schedule: quantity during land preparation =  
 (super phosphate: quantity)\*0.75 &  
 phosphoric acid schedule: quantity during third week = (phosphoric acid: quantity) \* 0.02 &

super phosphate schedule: advice =

)

(plant: name = bean)  
 plantation: type = low tunnel)

TABULATE

(potassium sulphate schedule: quantity during third week =  
 (potassium sulphate: quantity) \* 0.06 &  
 potassium sulphate schedule: quantity during fourth week =  
 (potassium sulphate: quantity) \* 0.06 &  
 potassium sulphate schedule: quantity during fifth week =  
 (potassium sulphate: quantity) \* 0.06 &  
 potassium sulphate schedule: quantity during sixth week =  
 (potassium sulphate: quantity) \* 0.06 &  
 potassium sulphate schedule: quantity during seventh week =  
 (potassium sulphate: quantity) \* 0.06 &  
 potassium sulphate schedule: quantity during eighth week =  
 (potassium sulphate: quantity) \* 0.10 &  
 potassium sulphate schedule: quantity during ninth week =  
 (potassium sulphate: quantity) \* 0.10 &  
 potassium sulphate schedule: quantity during tenth week =  
 (potassium sulphate: quantity) \* 0.10 &  
 potassium sulphate schedule: quantity during eleventh week =

(potassium sulphate: quantity) \* 0.08 &  
 potassium sulphate schedule: advice =  
 ')

(plant: name = bean &  
 plantation: type = tunnels &  
 macro element: nitrogen fertilizer name: = urea)

TABULATE

( urea schedule: quantity during land preparation = (urea: quantity) \* 0.125 \*  
 (tunnel: area/4200) &  
 urea schedule: quantity during first week = 0 &  
 urea schedule: quantity during second week = (urea: quantity) \* 0.15 \*  
 (tunnel: area/4200) &  
 urea schedule: quantity during third week = (urea: quantity) \* 0.09 \*  
 (tunnel: area/4200) &  
 urea schedule: quantity during fourth week = (urea: quantity) \* 0.09 \*  
 (tunnel: area/4200) &  
 urea schedule: quantity during fifth week = (urea: quantity) \* 0.06 \*  
 (tunnel: area/4200) &  
 urea schedule: quantity during sixth week = (urea: quantity) \* 0.06 \*  
 (tunnel: area/4200) &  
 urea schedule: quantity during seventh week = (urea: quantity) \* 0.06 \*  
 (tunnel: area/4200) &  
 urea schedule: quantity during eighth week = (urea: quantity) \* 0.044 \*  
 (tunnel: area/4200) &  
 urea schedule: quantity during ninth week = (urea: quantity) \* 0.044 \*  
 (tunnel: area/4200) &  
 urea schedule: quantity during tenth week = (urea: quantity) \* 0.044 \*  
 (tunnel: area/4200) &  
 urea schedule: quantity during eleventh week = (urea: quantity) \* 0.044 \*  
 (tunnel: area/4200) &  
 urea schedule: quantity during twelfth week = (urea: quantity) \* 0.044 \*  
 (tunnel: area/4200) &  
 urea schedule: quantity during thirteenth week = (urea: quantity) \* 0.017 \*  
 (tunnel: area/4200) &  
 urea schedule: advice ='

(plant: name = bean &  
 plantation: type = tunnels &  
 macro element: nitrogen fertilizer name = ammonium nitrate )

TABULATE

(ammonium nitrate schedule: quantity during land preparation =  
 (ammonium nitrate: quantity) \* 0.125 \* (tunnel: area/4200) &  
 ammonium nitrate schedule: quantity during first week = 0 &  
 ammonium nitrate schedule: quantity during second week =

(ammonium nitrate: quantity) \* 0.15 \* (tunnel: area/4200) &  
 ammonium nitrate schedule: quantity during third week =  
 (ammonium nitrate: quantity) \* 0.09 \* (tunnel: area/4200) &  
 ammonium nitrate schedule: quantity during fourth week =  
 (ammonium nitrate: quantity) \* 0.09 \* (tunnel: area/4200) &  
 ammonium nitrate schedule: quantity during fifth week =  
 (ammonium nitrate: quantity) \* 0.06 \* (tunnel: area/4200) &  
 ammonium nitrate schedule: quantity during sixth week =  
 (ammonium nitrate: quantity) \* 0.06 \* (tunnel: area/4200) &  
 ammonium nitrate schedule: quantity during seventh week =  
 (ammonium nitrate: quantity) \* 0.06 \* (tunnel: area/4200) &  
 ammonium nitrate schedule: quantity during eighth week =  
 (ammonium nitrate: quantity) \* 0.044 \* (tunnel: area/4200) &  
 ammonium nitrate schedule: quantity during ninth week =  
 (ammonium nitrate: quantity) \* 0.044 \* (tunnel: area/4200) &  
 ammonium nitrate schedule: quantity during tenth week =  
 (ammonium nitrate: quantity) \* 0.044 \* (tunnel: area/4200) &  
 ammonium nitrate schedule: quantity during eleventh week =  
 (ammonium nitrate: quantity) \* 0.044 \* (tunnel: area/4200) &  
 ammonium nitrate schedule: quantity during twelfth week =  
 (ammonium nitrate: quantity) \* 0.044 \* (tunnel: area/4200) &  
 ammonium nitrate schedule: quantity during thirteenth week =  
 (ammonium nitrate: quantity) \* 0.017 \* (tunnel: area/4200) &

ammonium nitrate schedule: advice ='

)

(plant: name = bean &  
 plantation: type = tunnels &  
 macro element: nitrogen fertilizer name = ammonium sulphate )

TABULATE

(ammonium sulphate schedule: quantity during land preparation =  
 (ammonium sulphate: quantity) \* 0.125 \* (tunnel: area/4200) &  
 ammonium sulphate schedule: quantity during first week = 0 &  
 ammonium sulphate schedule: quantity during second week =  
 (ammonium sulphate: quantity) \* 0.15 \* (tunnel: area/4200) &  
 ammonium sulphate schedule: quantity during third week =  
 (ammonium sulphate: quantity) \* 0.09 \* (tunnel: area/4200) &  
 ammonium sulphate schedule: quantity during fourth week =  
 (ammonium sulphate: quantity) \* 0.09 \* (tunnel: area/4200) &  
 ammonium sulphate schedule: quantity during fifth week =  
 (ammonium sulphate: quantity) \* 0.06 \* (tunnel: area/4200) &  
 ammonium sulphate schedule: quantity during sixth week =  
 (ammonium sulphate: quantity) \* 0.06 \* (tunnel: area/4200) &  
 ammonium sulphate schedule: quantity during seventh week =  
 (ammonium sulphate: quantity) \* 0.06 \* (tunnel: area/4200) &  
 ammonium sulphate schedule: quantity during eighth week =  
 (ammonium sulphate: quantity) \* 0.044 \* (tunnel: area/4200) &  
 ammonium sulphate schedule: quantity during ninth week =  
 (ammonium sulphate: quantity) \* 0.044 \* (tunnel: area/4200) &

ammonium sulphate schedule: quantity during tenth week =  
 (ammonium sulphate: quantity) \* 0.044 \* (tunnel: area/4200) &  
 ammonium sulphate schedule: quantity during eleventh week =  
 (ammonium sulphate: quantity) \* 0.044 \* (tunnel: area/4200) &  
 ammonium sulphate schedule: quantity during twelfth week =  
 (ammonium sulphate: quantity) \* 0.044 \* (tunnel: area/4200) &  
 ammonium sulphate schedule: quantity during thirteenth week =  
 (ammonium sulphate: quantity) \* 0.017 \* (tunnel: area/4200) &

ammonium sulphate schedule: advice ='

)

(plant: name = bean &  
 plantation: type = tunnels )

TABULATE

(super phosphate schedule: quantity during land preparation =  
 (super phosphate: quantity)\*0.35 \* (tunnel: area/4200) &  
 phosphoric acid schedule: quantity during third week =  
 (phosphoric acid: quantity) \* 0.075 \* (tunnel: area/4200) &  
 phosphoric acid schedule: quantity during fourth week =  
 (phosphoric acid: quantity) \* 0.075 \* (tunnel: area/4200) &  
 phosphoric acid schedule: quantity during fifth week =  
 (phosphoric acid: quantity) \* 0.05 \* (tunnel: area/4200) &  
 phosphoric acid schedule: quantity during sixth week =  
 (phosphoric acid: quantity) \* 0.05 \* (tunnel: area/4200) &  
 phosphoric acid schedule: quantity during seventh week =  
 (phosphoric acid: quantity) \* 0.05 \* (tunnel: area/4200) &  
 phosphoric acid schedule: quantity during eighth week =  
 (phosphoric acid: quantity) \* 0.04 \* (tunnel: area/4200) &  
 phosphoric acid schedule: quantity during ninth week =  
 (phosphoric acid: quantity) \* 0.04 \* (tunnel: area/4200) &  
 phosphoric acid schedule: quantity during tenth week =  
 (phosphoric acid: quantity) \* 0.04 \* (tunnel: area/4200) &  
 phosphoric acid schedule: quantity during eleventh week =  
 (phosphoric acid: quantity) \* 0.04 \* (tunnel: area/4200) &  
 phosphoric acid schedule: quantity during twelfth week =  
 (phosphoric acid: quantity) \* 0.04 \* (tunnel: area/4200) &  
 phosphoric acid schedule: quantity during thirteenth week =  
 (phosphoric acid: quantity) \* 0.019 \* (tunnel: area/4200) &

phosphoric acid schedule: advice ='

)

(plant: name = bean &  
plantation: type = tunnels)

TABULATE

(potassium sulphate schedule: quantity during third week =  
    (potassium sulphate: quantity) \* 0.10 \* (tunnel: area/4200) &  
potassium sulphate schedule: quantity during fourth week =  
    (potassium sulphate: quantity) \* 0.10 \* (tunnel: area/4200) &  
potassium sulphate schedule: quantity during fifth week =  
    (potassium sulphate: quantity) \* 0.07 \* (tunnel: area/4200) &  
potassium sulphate schedule: quantity during sixth week =  
    (potassium sulphate: quantity) \* 0.07 \* (tunnel: area/4200) &  
potassium sulphate schedule: quantity during seventh week =  
    (potassium sulphate: quantity) \* 0.07 \* (tunnel: area/4200) &  
potassium sulphate schedule: quantity during eighth week =  
    (potassium sulphate: quantity) \* 0.06 \* (tunnel: area/4200) &  
potassium sulphate schedule: quantity during ninth week =  
    (potassium sulphate: quantity) \* 0.06 \* (tunnel: area/4200) &  
potassium sulphate schedule: quantity during tenth week =  
    (potassium sulphate: quantity) \* 0.06 \* (tunnel: area/4200) &  
potassium sulphate schedule: quantity during eleventh week =  
    (potassium sulphate: quantity) \* 0.06 \* (tunnel: area/4200) &  
potassium sulphate schedule: quantity during twelfth week =  
    (potassium sulphate: quantity) \* 0.06 \* (tunnel: area/4200) &  
potassium sulphate schedule: quantity during thirteenth week =  
    (potassium sulphate: quantity) \* 0.035 \* (tunnel: area/4200) &  
potassium sulphate schedule: advice =

)

- The following rules in the calculation model in the technical report "Generic fertilization applied on tomato" number TR/CLAES/140/2000.5 page 22 should be updated to the following (the **bolded** premises must be added while the *italic* must be deleted):

(plant: name = X &  
    X: element = N &  
macro element: nitrogen fertilizer name = ammonium nitrate &  
X: N content = XNC &  
environment: N quantity = ENQ &  
calcium nitrate: quantity = CaNQ &  
calcium nitrate: ratio of N = CaNRN &  
ammonium nitrate: ratio of N = ANRN &  
ammonium nitrate: usefulness coefficient = ANUC&

*(plantation: irrigation type = flooding OR  
soil: calcium carbonate < 10))*

CALCULATE FERTILIZER QUANTITY

(ammonium nitrate: quantity = ((XNC-ENQ) - CaNQ \* CaNRN) \* (1/ ANRN) \* ANUC)

(plant: name = X &  
X: element = P &  
(Plantation: type = tunnels OR  
**Plantation: type = low tunnels) &**

*(Plantation: type <> tunnels &  
Plantation: irrigation type <> flooding)) &  
dripping irrigation macro element: phosphor fertilizer name =  
phosphoric acid 75%&*

X: P content = XPC &  
environment: P quantity = EPQ &  
phosphoric acid 75%: ratio of P = PARP &  
phosphoric acid 75%: usefulness coefficient = PAUC)

**CALCULATE FERTILIZER QUANTITY**

(phosphoric acid 75%: quantity = ((XPC - EPQ) \* (1/ PARP) \* PAUC)

(plant: name = X &  
X: element = N &  
macro element: nitrogen fertilizer name = urea &  
X: N content = XNC &  
environment: N quantity = ENQ &  
calcium nitrate: quantity = CaNQ &  
calcium nitrate: ratio of N = CaNRN &  
urea: ratio of N = URN &  
urea: usefulness coefficient = UUC &

*(plantation: irrigation type = flooding OR  
soil: calcium carbonate < 10))*

**CALCULATE FERTILIZER QUANTITY**

(urea: quantity = ((XNC - ENQ) - CaNQ \* CaNRN) \* (1/ URN) \* UUC)

- **The following rules must be deleted from the calculation model in the technical report Generic fertilization applied on tomato number TR/CLAES/140□/2000.5 page 22**

*(plant: name = X &  
X: element = N &  
macro element: nitrogen fertilizer name = urea &  
X: N content = XNC &  
environment: N quantity = ENQ &*

*calcium nitrate: quantity = CaNQ &*  
*calcium nitrate: ratio of N = CaNRN &*  
*urea: ratio of N = URN &*  
*urea: usefulness coefficient = UUC &*  
*(plantation: irrigation type <> flooding &*  
*soil: calcium carbonate >= 10))*  
 CALCULATE FERTILIZER QUANTITY  
*(urea: quantity = ((XNC - ENQ) - CaNQ \* CaNRN) \* (1/ URN) \* UUC) \* 0.9*

*(plant: name = X &*  
*X: element = N &*  
*macro element: nitrogen fertilizer name = urea &*  
*urea: quantity = UQ &*  
*urea: ratio of N = URN &*  
*nitric acid: ratio of N = NARN &*  
*(plantation: irrigation type <> flooding &*  
*soil: calcium carbonate >= 10))*  
 CALCULATE FERTILIZER QUANTITY  
*(nitric acid: quantity = ((UQ \* URN) \* 1/ NARN) \* 0.1)*

*(plant: name = X &*  
*X: element = N &*  
*macro element: nitrogen fertilizer name = ammonium nitrate &*  
*X: N content = XNC &*  
*environment: N quantity = ENQ &*  
*calcium nitrate: quantity = CaNQ &*  
*calcium nitrate: ratio of N = CaNRN &*  
*ammonium nitrate: ratio of N = ANRN &*  
*ammonium nitrate: usefulness coefficient = ANUC &*  
*(plantation: irrigation type <> flooding &*  
*soil: calcium carbonate >= 10))*  
 CALCULATE FERTILIZER QUANTITY  
*(ammonium nitrate: quantity = ((XNC-ENQ) - CaNQ \*CaNRN) \* (1/ ANRN) \* ANUC) \* 0.9*

*(plant: name = X &*  
*X: element = N &*  
*macro element: nitrogen fertilizer name = ammonium nitrate &*  
*ammonium nitrate: quantity = ANQ &*  
*ammonium nitrate: ratio of N = ANRN &*  
*nitric acid: ratio of N = NARN &*  
*(plantation: irrigation type <> flooding &*  
*soil: calcium carbonate >= 10))*  
 CALCULATE FERTILIZER QUANTITY  
*(nitric acid: quantity = ((ANQ \* ANRN) \* 1/ NARN) \* 0.1)*

(plant: name = X &  
 X: element = P &  
 X: P content = XPC &  
 environment: P quantity = EPQ &  
 triple super phosphate: ratio of P = TSPRP &  
 triple super phosphate: usefulness coefficient = TSPUC)  
 CALCULATE FERTILIZER QUANTITY  
 (triple super phosphate: quantity = (XPC - EPQ) \* (1/ TSPRP) \* TSPUC)

(plant: name = X &  
 X: element = Cu &  
 X: Cu ratio = CuR &  
 plantation: optimum -yield = Y &  
 plant: predicted yield factor = PY)  
 CALCULATE ELEMENT IN PLANT  
 (X: Cu content = CuR\*1000 \* Y \* PY \*1.2)

## 4 . Interface

### 4.1 Input Data

The items 'Irrigation type' & 'Phosphorus fertilizer' in the figure 2 in the technical report 'Generic fertilization applied on tomato' number 'TR/CLAES/140/2000 should be deleted.

Also, the items 'Copper quantity in ppm' , 'Percentage calcium carbonate' & 'Total water quantity in cubic meter/feddan' in the figure 3 should be deleted.



## 4.2 Output Interface

Figure 4 should update as follows:

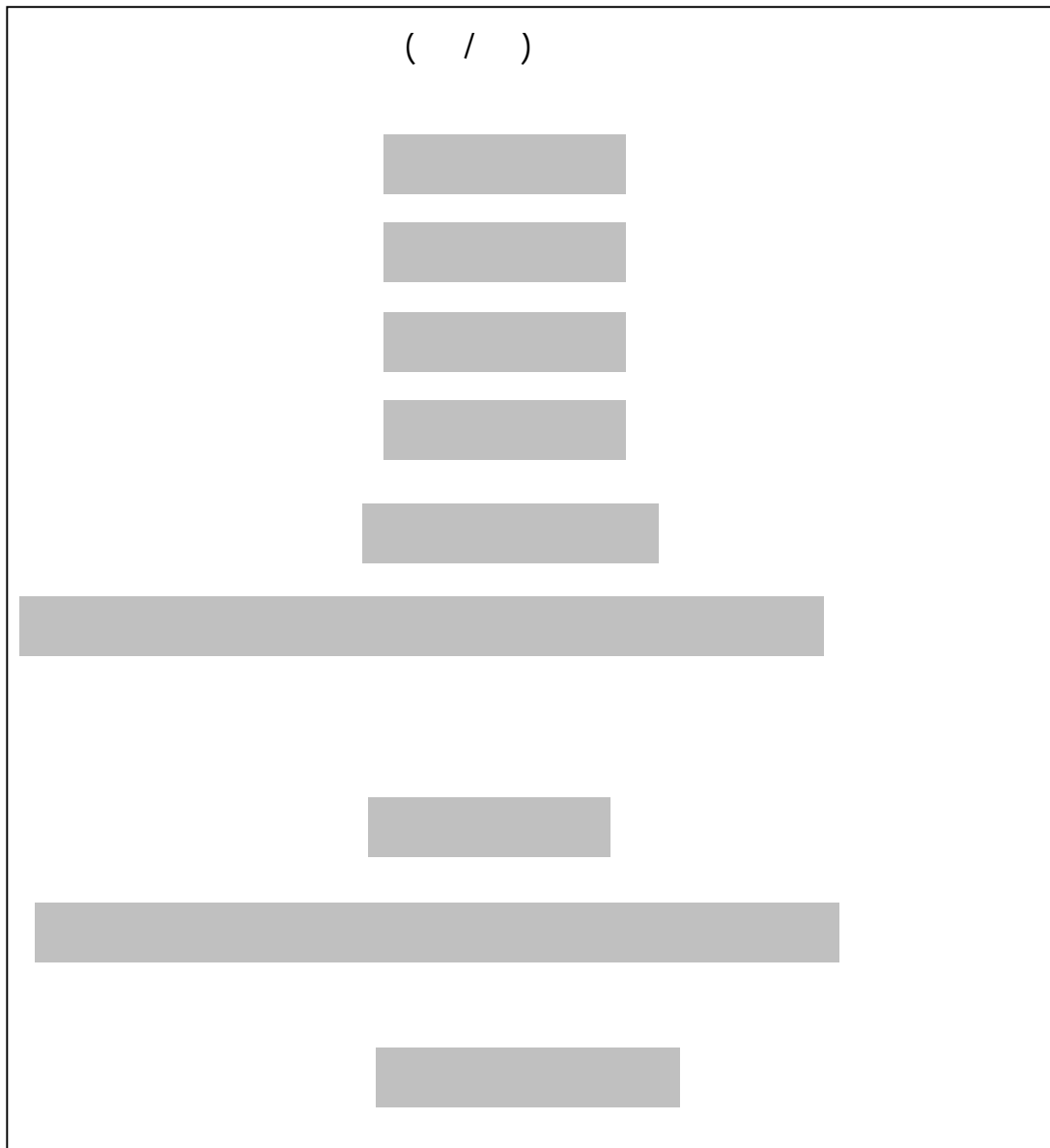


Figure 5 should be updated as follows (in the case of open field):

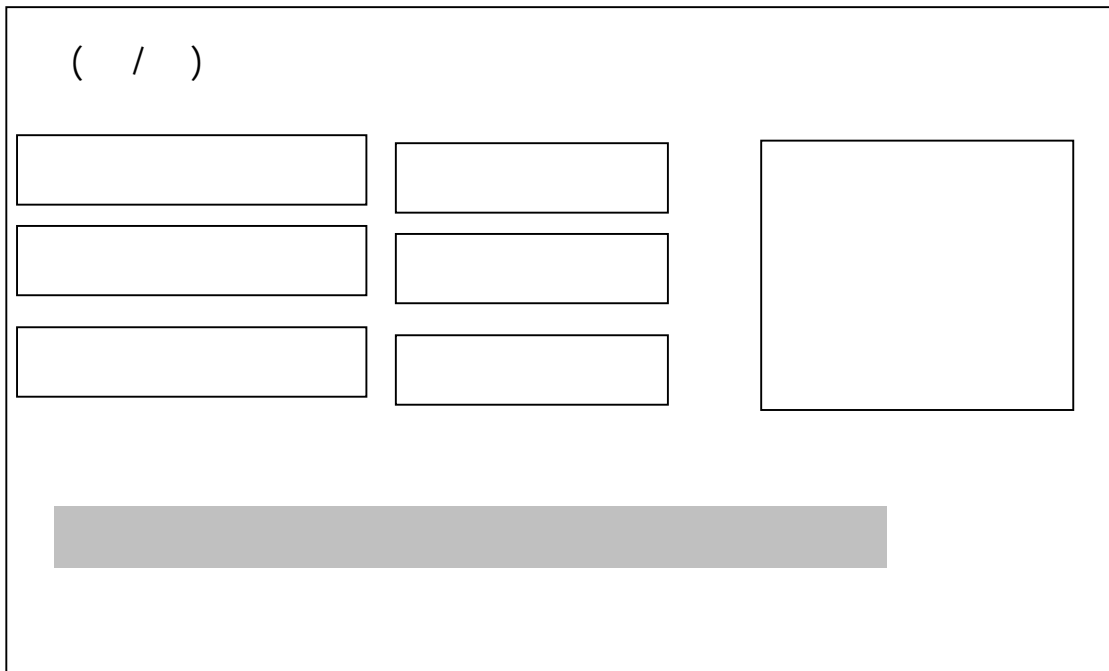
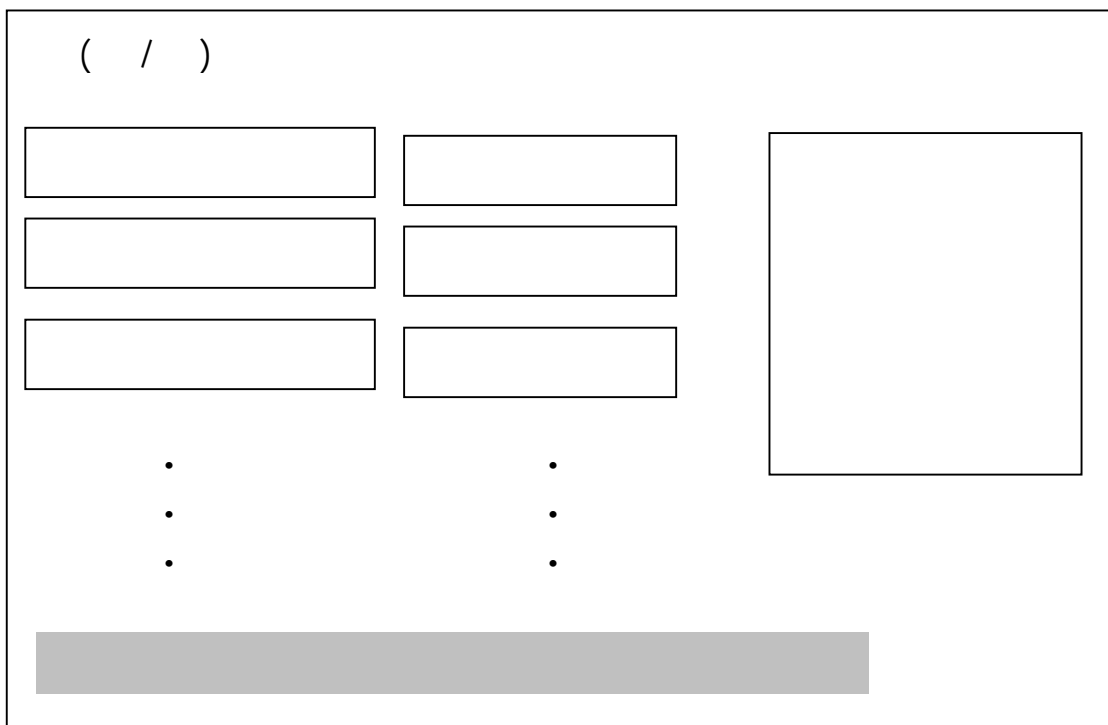


Figure 6 should be updated as follows: ( / ) in the case of low tunnel, but in the case of tunnels the unit of is ( / ) in the case of tunnels)



## 5. Test Cases

### Case 1

#### Inputs

نوع الزراعة:

ملوحة التربة: 1

ملوحة مياه الري: 0.4

تاريخ الزراعة: 2001/9/1

السماذ العضوي:

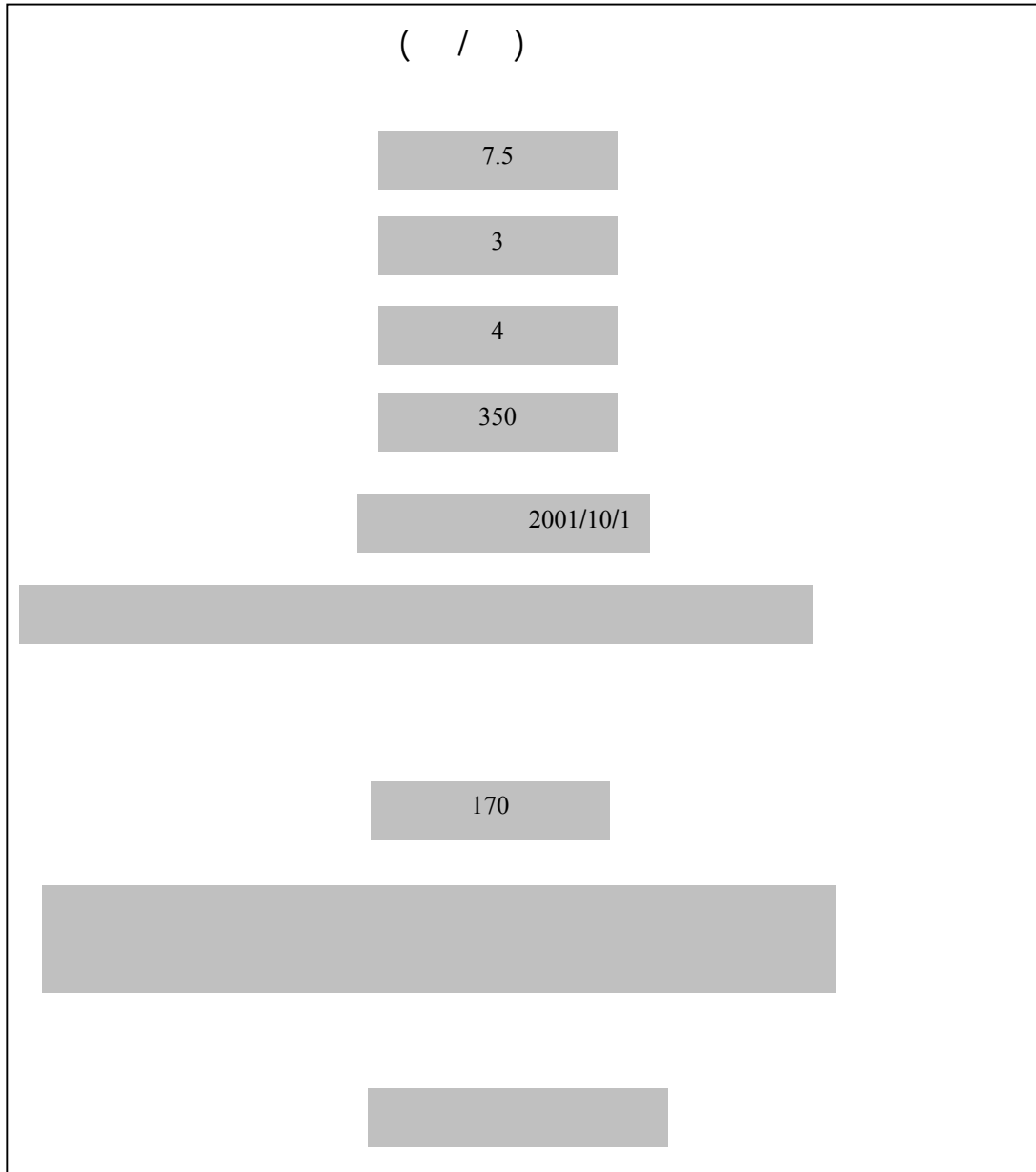
حجم السماذ العضوي: 4 /

تحليل التربة:

:

تحليل مياه الري:

# Outputs



( / )

225

450

225

( / )

345

115

0

( / )

0		
300		
300		

## Case 2

### Inputs

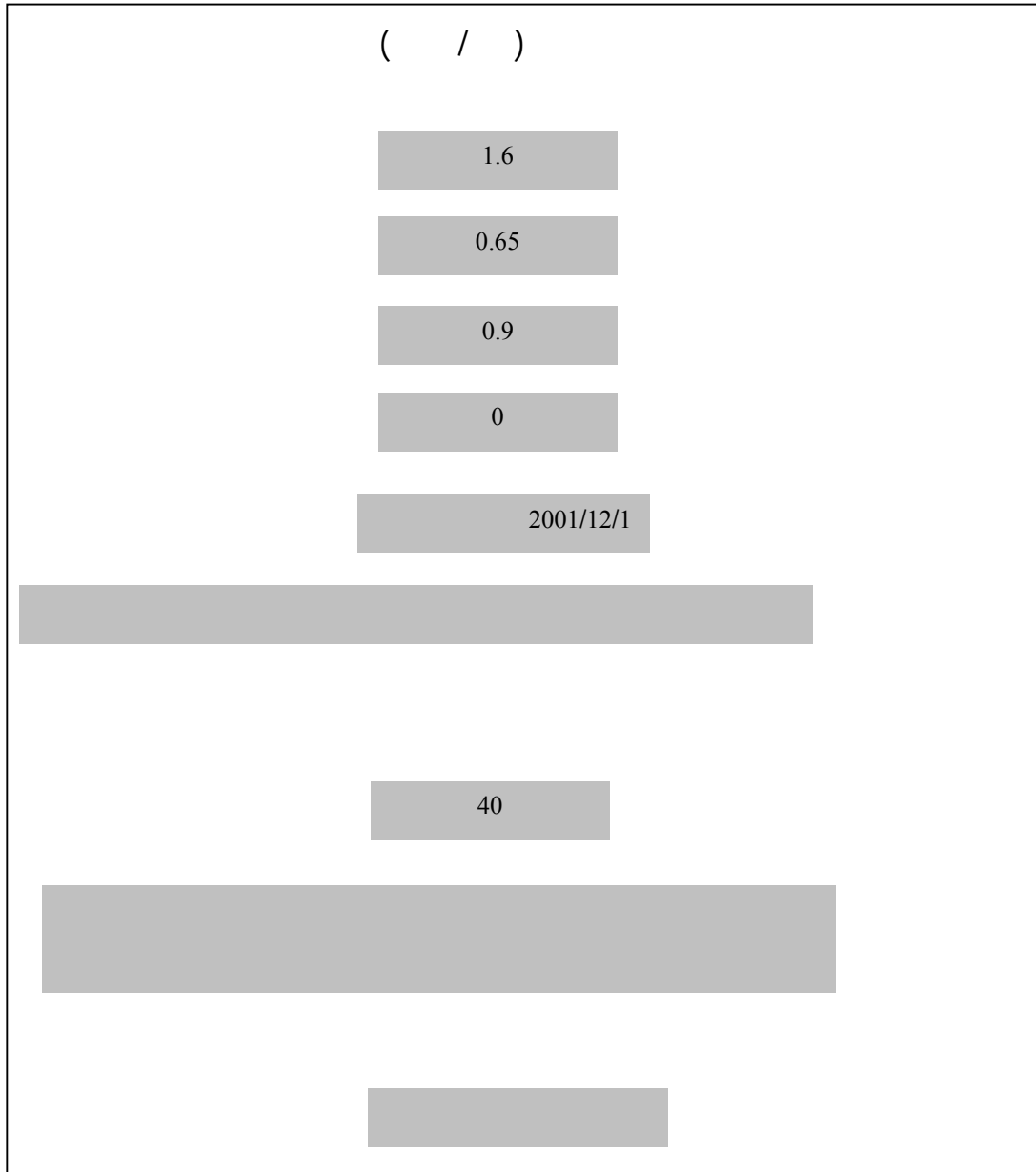
نوع الزراعة:  
 مساحة الصوبة: 420  
 ملوحة التربة: 1.5  
 ملوحة مياه الري: 0.8  
 تاريخ الزراعة: 2001/11/1  
 السماد العضوي:  
 حجم السماد العضوي: 4 /

تحليل التربة:

:

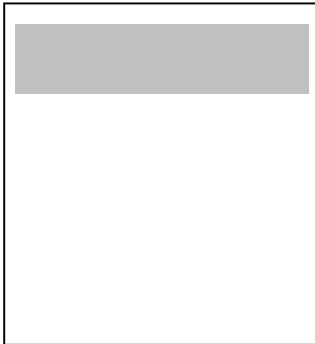
تحليل مياه الري:

# Outputs



( / )

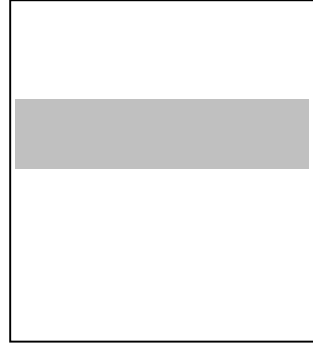
19	
0	
22.8	
13.7	
13.7	
9.1	
9.1	
9.1	
6.7	
6.7	
6.7	
6.7	
6.7	
6.7	
2.6	





( / )

40



0

0

0

0

0

0

0

0

0

0

0

0

0



( / )

0

0

0

6.3

6.3

4.2

4.2

4.2

3.4

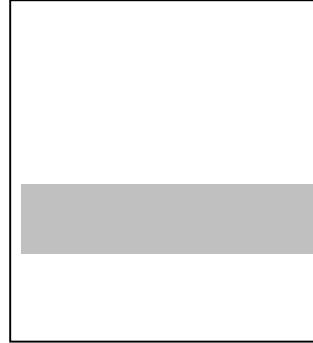
3.4

3.4

3.4

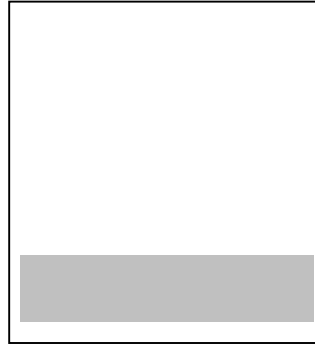
3.4

1.6



( / )

0



0

0

15

15

10.5

10.5

10.5

9

9

9

9

9

5

