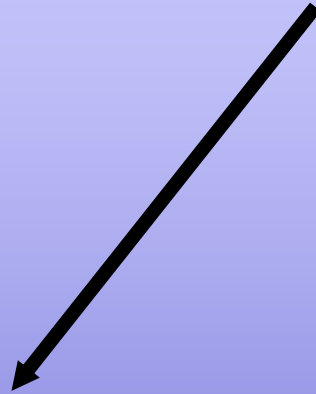


**Forecasting model  
for aphids on  
vegetable crops**

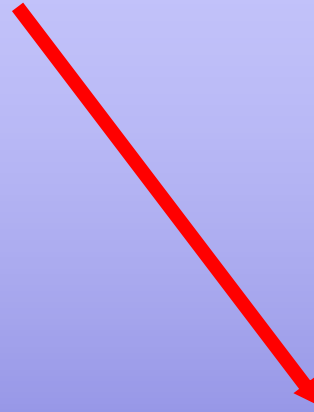


# DAMAGES



Direct damage

Lymph suction



# Virus transmission

## non persistent

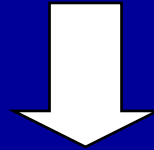
- Tasting suction
- Rapid diffusion
- Insecticide efficacy is low
- CMV, PVY

## persistent

- Time is necessary for the aphid to acquire the virus and transmit it
- Insecticides are effective
- PLRV

## NON PERSISTENT VIRUS TRANSMISSION

- Correlation between the % of infection and the overall number of aphids infesting the crop
- Occurrence and consistency of the aphids are influenced by the climatic conditions in autumn and winter
- Aphid efficiency in virus transmission is optimal during the first phenological stages of the crop



**The prediction of aphid consistency in spring is useful to define the pest control strategy**

# FORECASTING MODEL

- BUILT-UP by Institute of industrial crops (ISCI)
- It estimates the most important spring flight consistency in the territory
- Prediction can done beginning from february

# CONTROL STRATEGY IN RISKY YEARS

- Use of virus-free plant material
- Switch the crop cycle compare to the aphid one
- Weed control
- Spray focusing towards the aphids

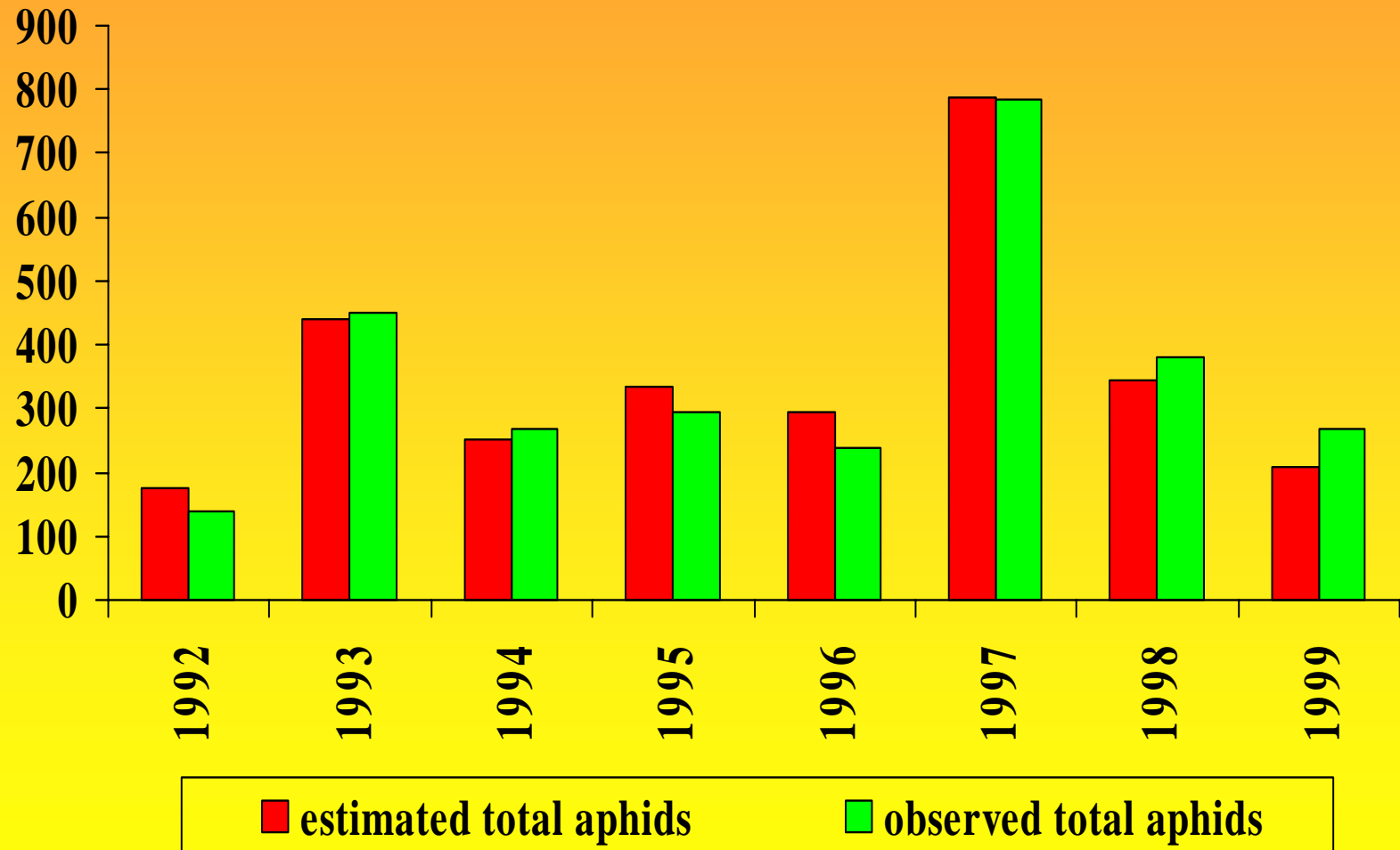
## Forecasting model build-up

- Spring aphid catches from 1992 to 1999 on potato in two locations (Budrio and Ozzano)
- Identification of the species
- Ranking of the species on the bases of their life cycle (olocycle, anolocycle, anolocycle or olocycle)
- Weather data of the specific areas
- Linear and multiple regression between the catches and several climatic factors

## forecasting model build-up

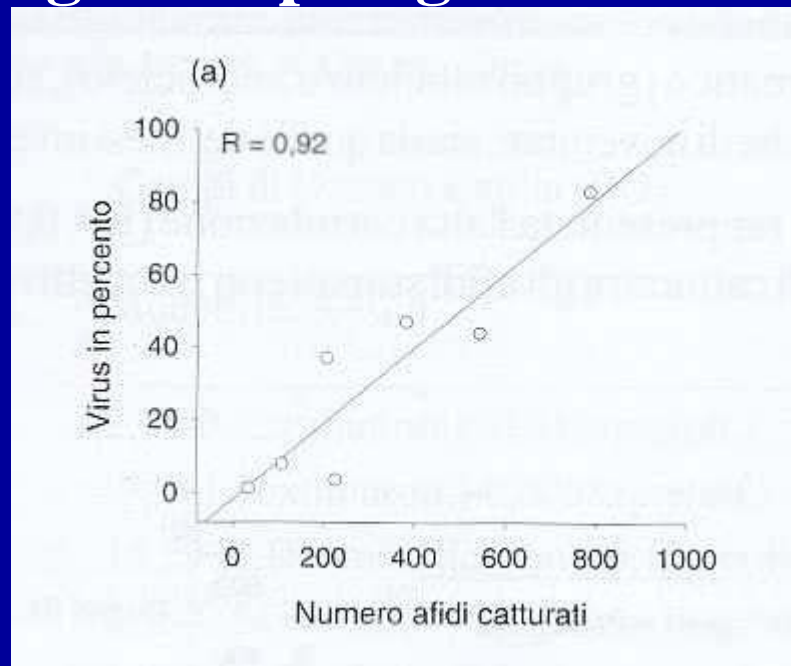
- olocycle group (overwinters as egg) is related with minimum temperature and precipitation in october
- anolocycle (overwinters as adult) is related to minimum temperature and precipitation in december and january
- anolocycle-olocycle is related to the number of frosty days and wind velocity in november and minimum temperature and precipitation in december and january

# Comparison between estimated aphids and those observed in the field - ISCI trials (1992-1999)

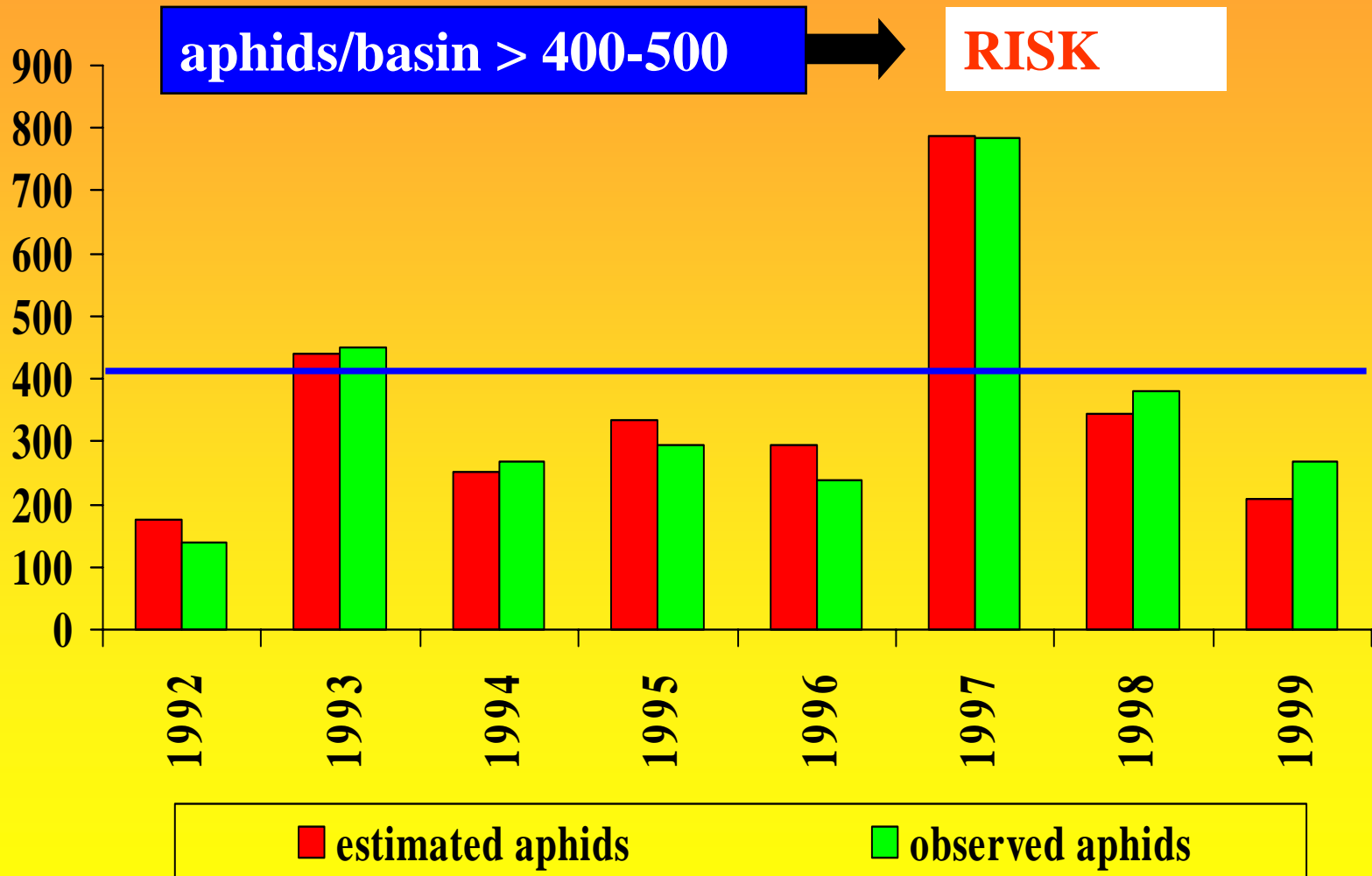


# CORRELATION BETWEEN INFECTION AND APHID FLIGHT CONSISTENCY

- **Trials carried out from 1992 to 1998 have showed a good correlation between the percentage of PVY infection and the number of aphids caught in spring**



# Comparison between number of estimated aphids by the model and those observed in the field



# **Model evaluation in different areas of the region and on different crops (2001-2003)**

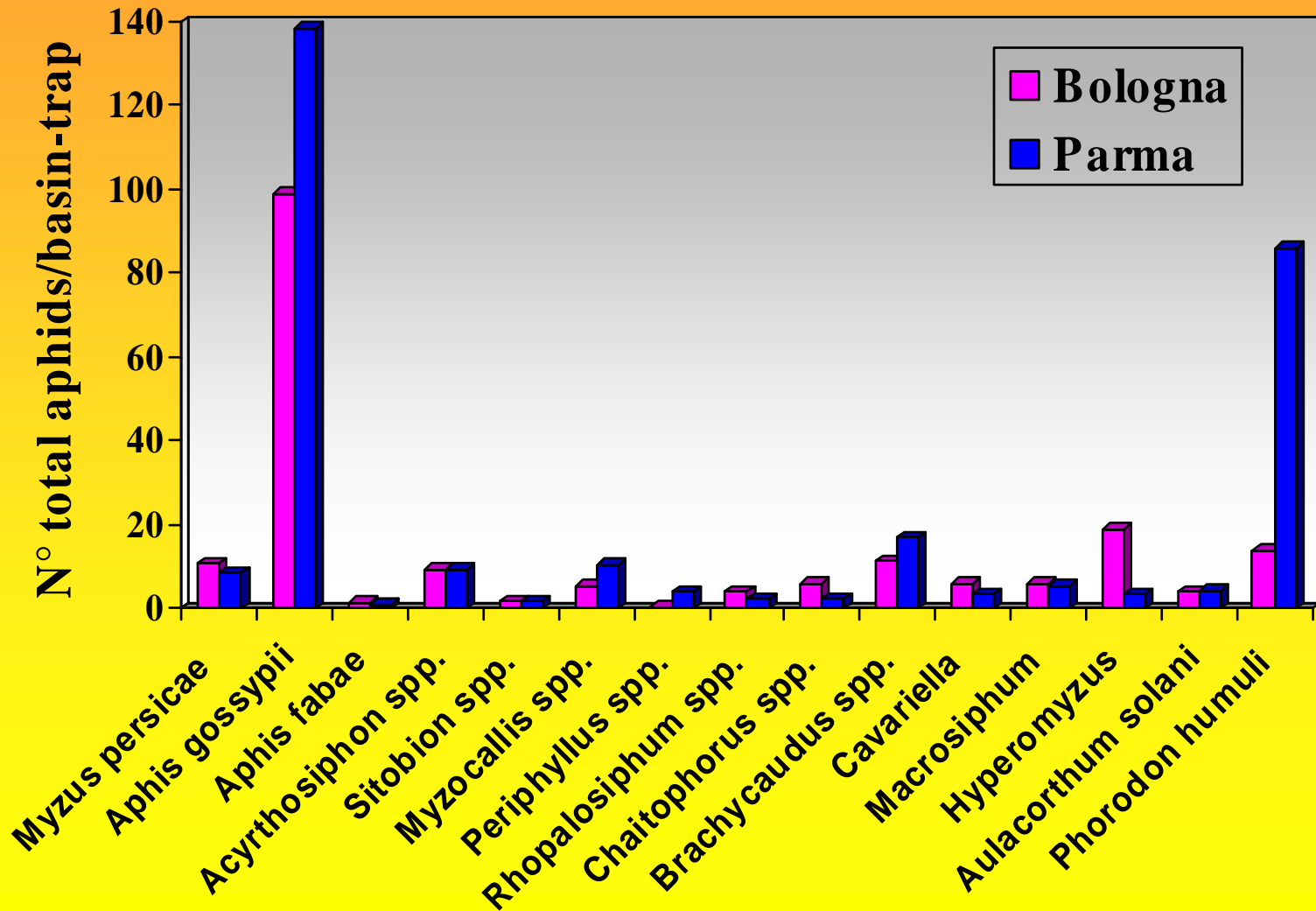
## **APHID FIELD MONITORING**

- POTATO AND TOMATO PLOTS**
- Parma, Bologna and Ferrara**
- Moericke basin-trap (2 / plot)**
- surveys twice a week from the beginning of april to the end of may**

# Basin-trap for aphid catches



# Aphids caught with Moericke basin-trap on 2001





*Aphis gossypii*



*Phorodon humuli*



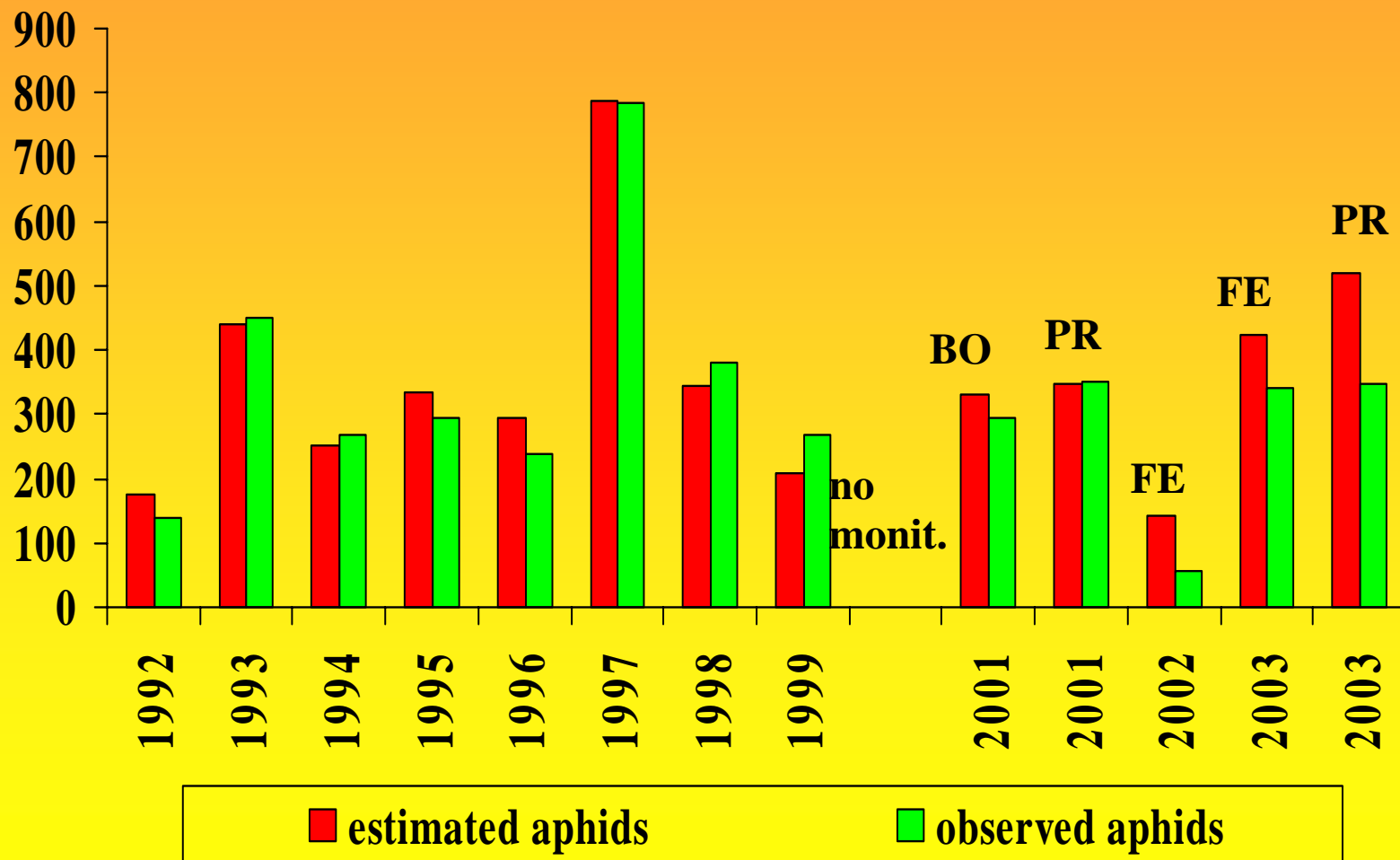
*Myzus persicae*

# **Model evaluation in different areas of the region and on different crops over 2001 and 2003**

## **Prediction calculation**

- Weather data of met-station close to the monitored plots**
- Species-related model application**
- Estimated overall number of aphids in each location**

# Comparison between the estimated N° of aphids and those observed in the field over the years 1992-2003



# Prediction of aphid flight consistency

