

# Could biobeds be of any use in greenhouse production?

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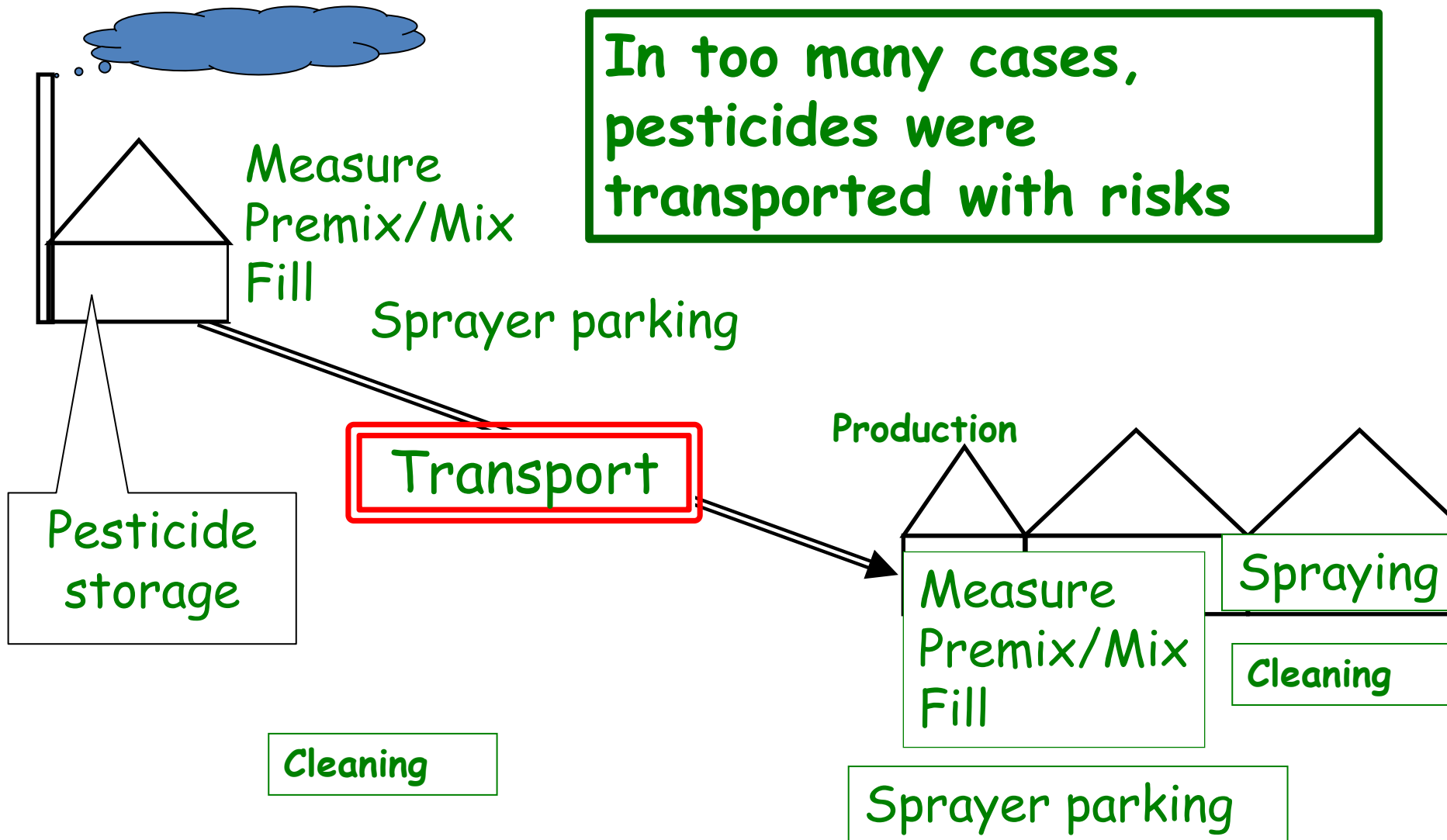
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# Background

- Greenhouses have been regarded as closed systems, but
- Pesticide residues are found in waterways and can be related to greenhouse production
- In a previous project, handling of pesticides was investigated through case studies, during real life situations, indicating both good and bad examples
- The first results were presented at the 2<sup>nd</sup> European Biobed Workshop in Ghent 2007

In too many cases,  
pesticides were  
transported with risks



Only bad examples are shown, to motivate need of  
changes

# 1. Logistics





## 2. "Semi-temporary" storage





### 3. Measuring - premixing

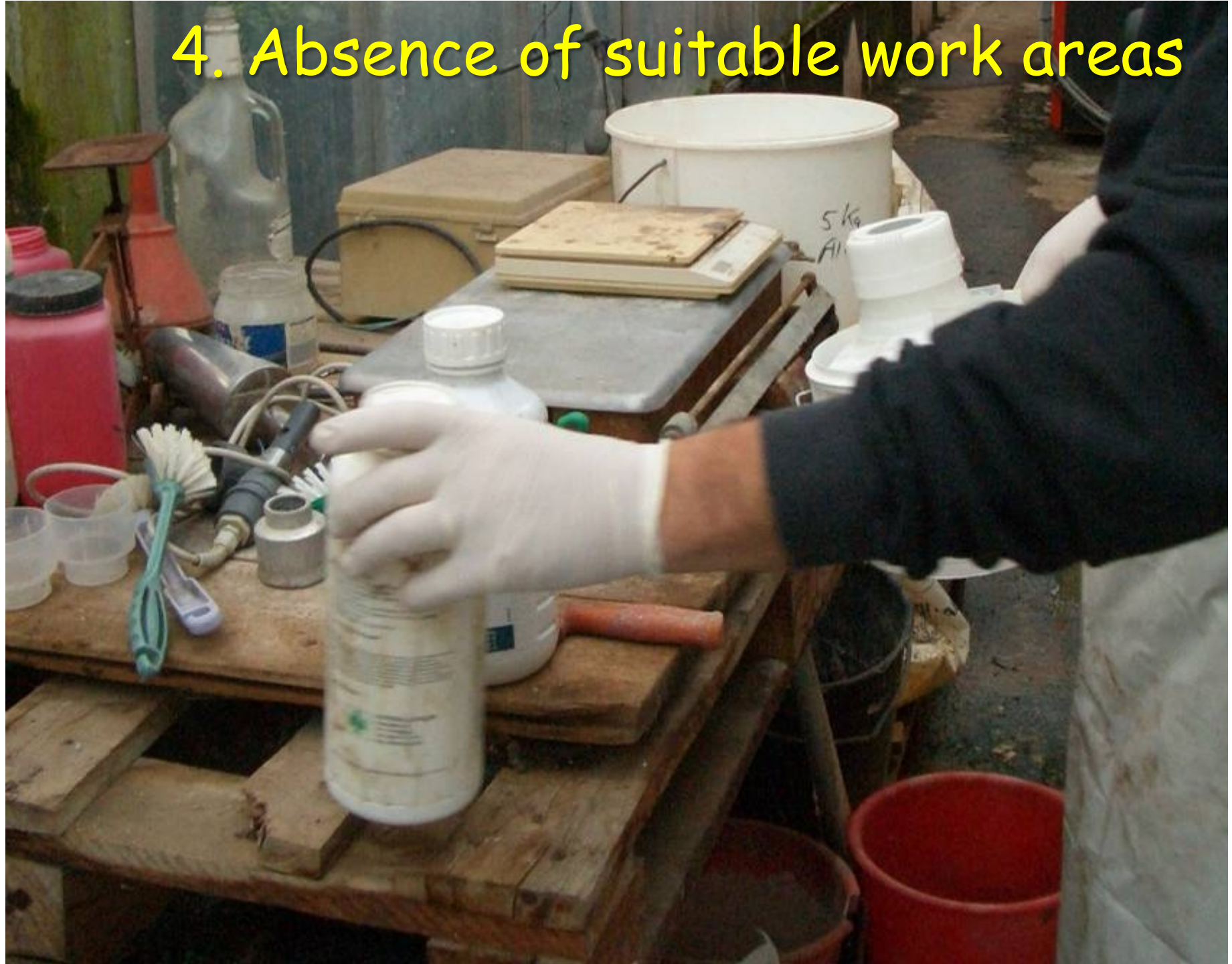


### 3. Measuring - premixing





## 4. Absence of suitable work areas





## 5. Filling





## 6. Cleaning









## 7. Parking



# FIRST SUMMARY

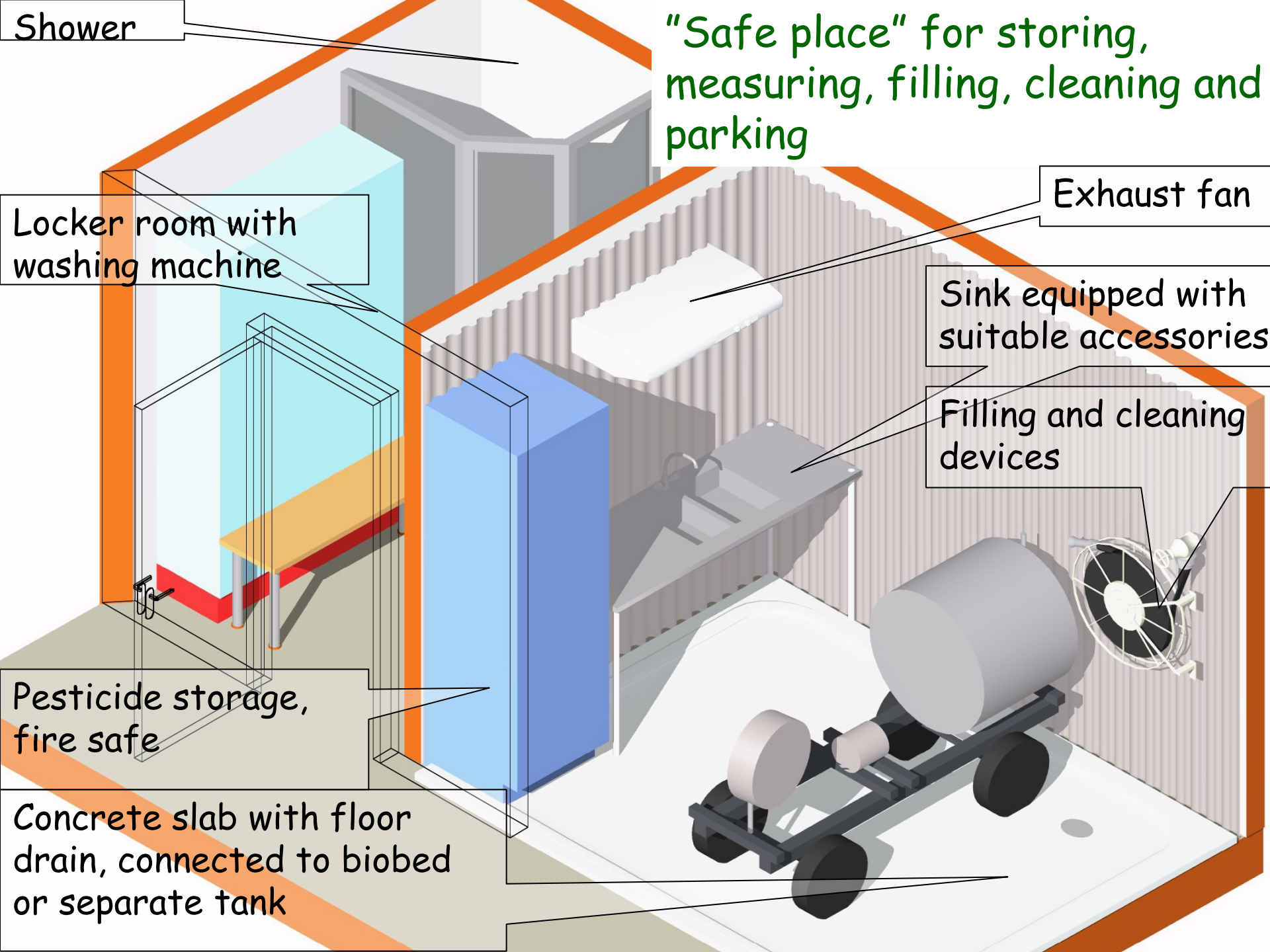
- "System error": Pesticide storage room far off caused many risk situation and prevented many detail improvements
- No specified place for filling, neither for cleaning, nor for parking
- Most small companies filled only one tank at a time, while large companies filled several spray tanks during a spray operation
- Many good and useful examples were noted

## Suggestions -> handling

After analysis of input and discussions with growers and advisers, we suggest that growers arrange a "safe place", positioned to be of best use, in relation to the spray operations.

All water collected here, is pumped to a biobed or container for later safe disposal.





Shower

"Safe place" for storing,  
measuring, filling, cleaning and  
parking

Locker room with  
washing machine

Exhaust fan

Sink equipped with  
suitable accessories

Filling and cleaning  
devices

Pesticide storage,  
fire safe

Concrete slab with floor  
drain, connected to biobed  
or separate tank



Mock-up, used to get suggestions from growers, advisors, students, etc



# Biobeds in/by greenhouses?

- Biobeds exist in Swedish greenhouses, but the use of them might be improved
- Outdoor biobeds? Temperature? Heated?
- Indoor biobeds? Pest breeding place?
- How to involve the biobed in all moments of the spray operation?
- Could a biobed handle large volumes of polluted irrigation discharge water?
- What about losses on the floor?

















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# Conclusions so far

- ! It is possible to make positive changes, also in greenhouse situations, to reduce point sources, related to handling of pesticides
- ¿ Could we **integrate** a biobed in the greenhouse operations, or?
- ¿ What about pesticide losses to the greenhouse floor?
- ¿ How to handle discharge water?
- ¿ Do we have better alternatives?

# Ongoing projects

Measurements of pesticide residues in greenhouse floors - depths, crops, soil, active ingredients, etc. to indicate risk for leakage

Grower courses to inform on risks and to stimulate installing recirculating irrigation systems

Studies of material to neutralize pesticides reaching the floor

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# Questions ?

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