Challenging land fragmentation

Thanks to a mobile robot…

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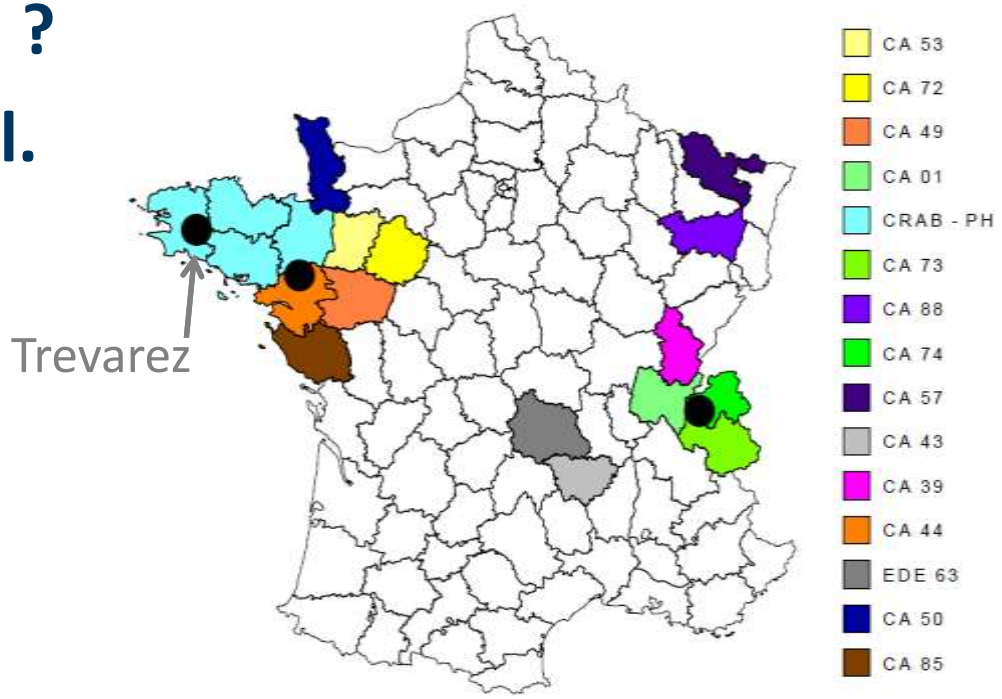
Dairy production background in (western) France

- Main types of management strategies and production systems
- Feeding system : grazed grass – maize silage- 140 g concentrate per litre milk
- Increase in herd size (av. 55 cows) and quota still linked to ground
- Destruction of field organisation
- Decrease in grazeable area per cow around buildings
- Increase in purchases of AMS to limit compulsory working time

The French research program on robotic milking and grazing

- How to integrate grazing in a robotic milking system ?
- 3 experimental sites incl. Trevarez, 21 pilot farms
- 4 years
- Various production systems and climates : plains / mountains



Transfering knowledge :
User's guide for the robot owner to develop a rearing system based on grazed grass

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Trevarez experimental farm

- Located in western France, cool and wet situation (average rainfall : 1260 mm); oceanic climate
- Applied research dairy farm with 150 Holstein cows + 140 heifers- 1,180,000 l of quota- 183 ha
- Target : maximising milk from forages – grazed grass

Variable costs per energy unit :

Grazed grass	Stored forages (maize or grass silage, hay)	Concentrate
1	4	15

The three farmlets in Trevarez

3 systems implemented to fit with main farmers issues in Brittany

DAIRYMAN

2009 to 201?	S1 Limited access	S2 Average access	S3 Limited access
Nbr of cows	48	54	45-60
Grazed grass per cow (ha)	0.15	0.38	0.35+0.15

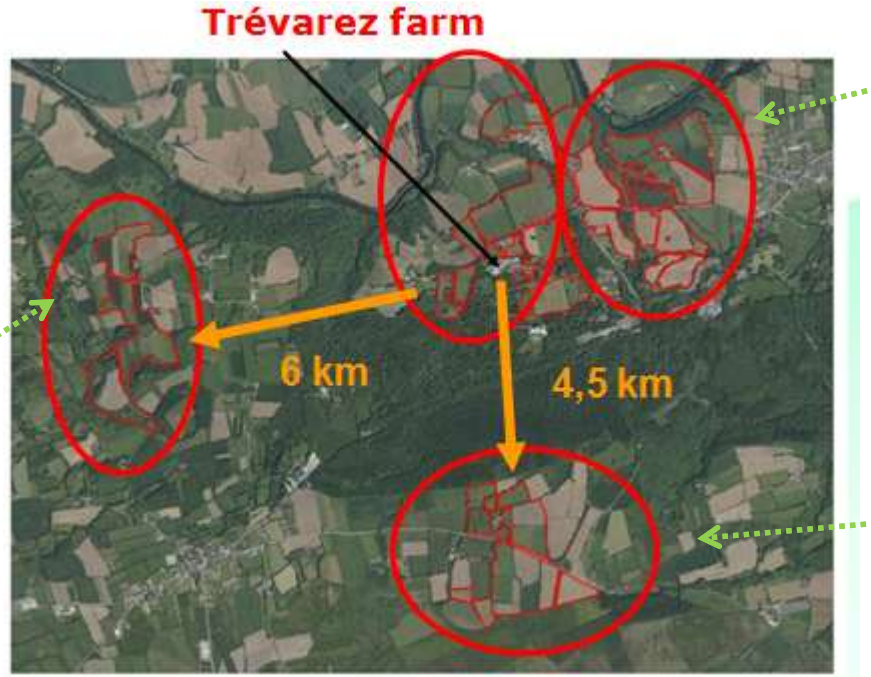
Limited grazable area
Maize silage and conc
9,000 kg milk/cow

Milk from forages
Grazed grass
100 g conc/ l milk
7,500 kg milk/cow

Milk from grass
Mobile robot
Organic prod

Trevarez experimental farm : 44 ha of grazable area / 183

- **As many Breton farms, facing land fragmentation: 4 blocks, distances, road traffic, …**



Original site
2 blocks split by main road

Recently rent ; Crops

275 m asl :
Cold and wet
Good grass growth
Not suitable for crops

How to graze the remote areas…a modern way ?

- Grazed grass : base of forage system (cost, working time, environmental restraints…)
- New demands on good profile fatty acids, animal welfare
- KEEP GRAZING !!!

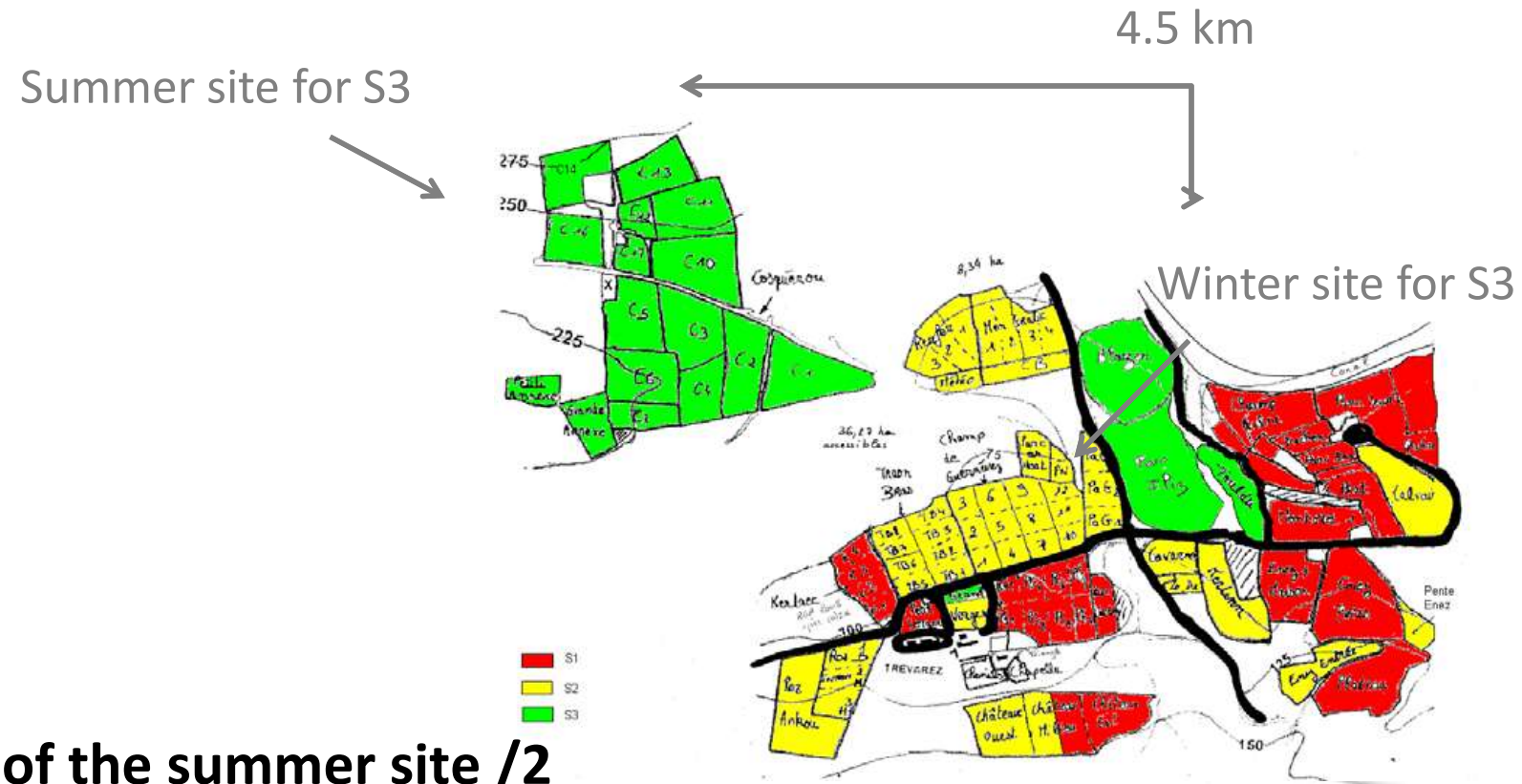
- Solutions to graze the non grazeable area ?
- Give modern outlook to grazing ?
- Bring robotic milking into grass based systems ?

The solution ? Move cows and milking parlour

- Graze the current non grazeable area thanks to mobile robot
- Moved twice a year in average climatic conditions:

  1 summer location (15th April-15th October)
  1 winter location in new barn (grazing in transition periods)
- Review of existing prototypes
- Many trips through Europe
- European project (Autograssmilk)
- French Research program and funding

Field allocation for the 3 systems



- **Choice of the summer site /2**
- **Winter site with new building**

2 options for the mobile robot

- Political + technical agreement : 2 years
- specifications written – call for tenders
- 2 options

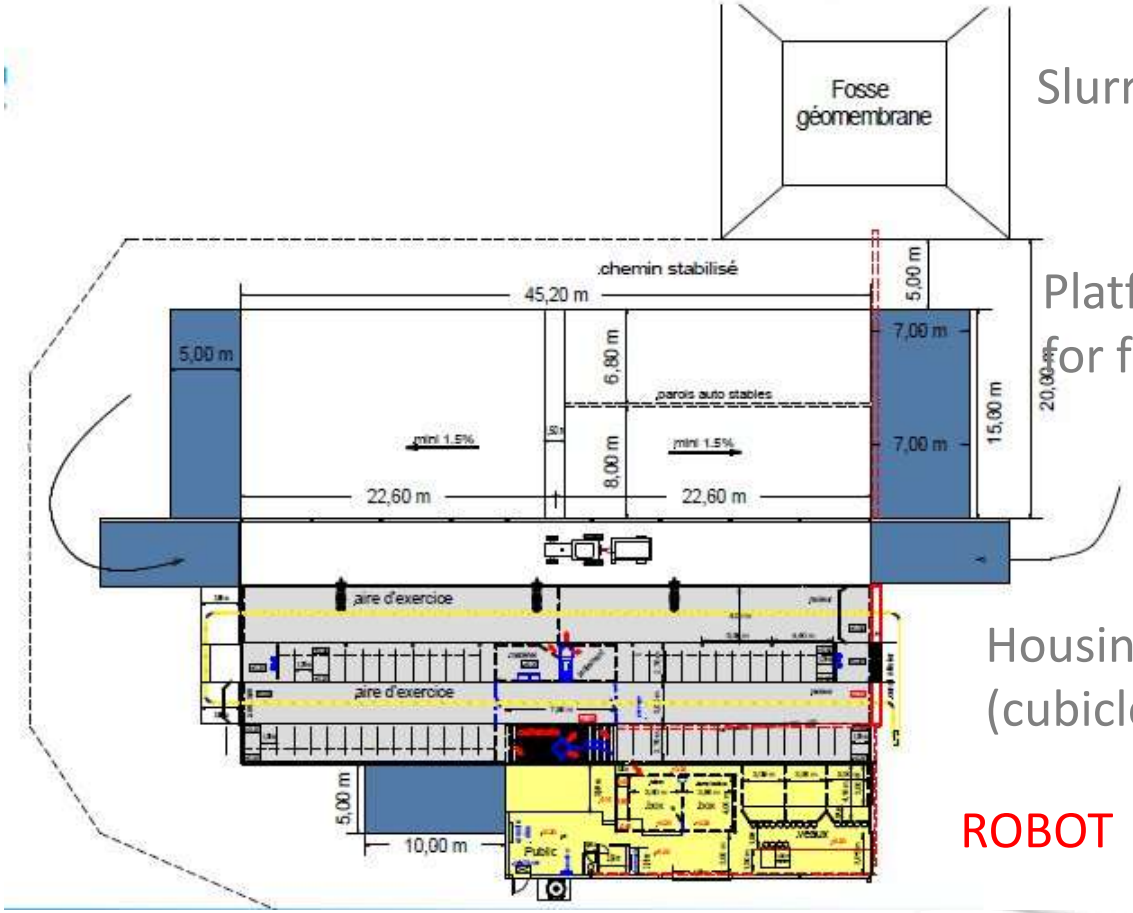
- mobile robot on a trailer + platform
- Funding completed July 2011 (400,000 €)

The prototype and its design

- The "Belgian" solution with two trailers (Rolland SA)
- 1 Delaval AMS on a trailer
- 1 trailer for the milk tank

The winter site

- New barn for 60 cows
- 0.15 ha per cow for grazing
- 2 groups possible
- Winter trials on organic diets

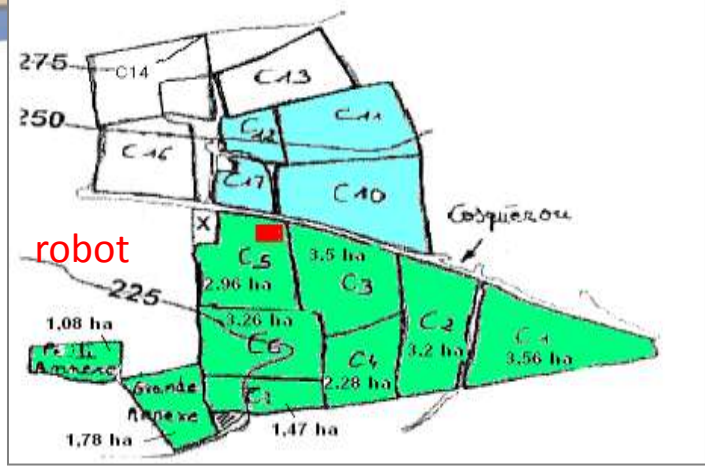


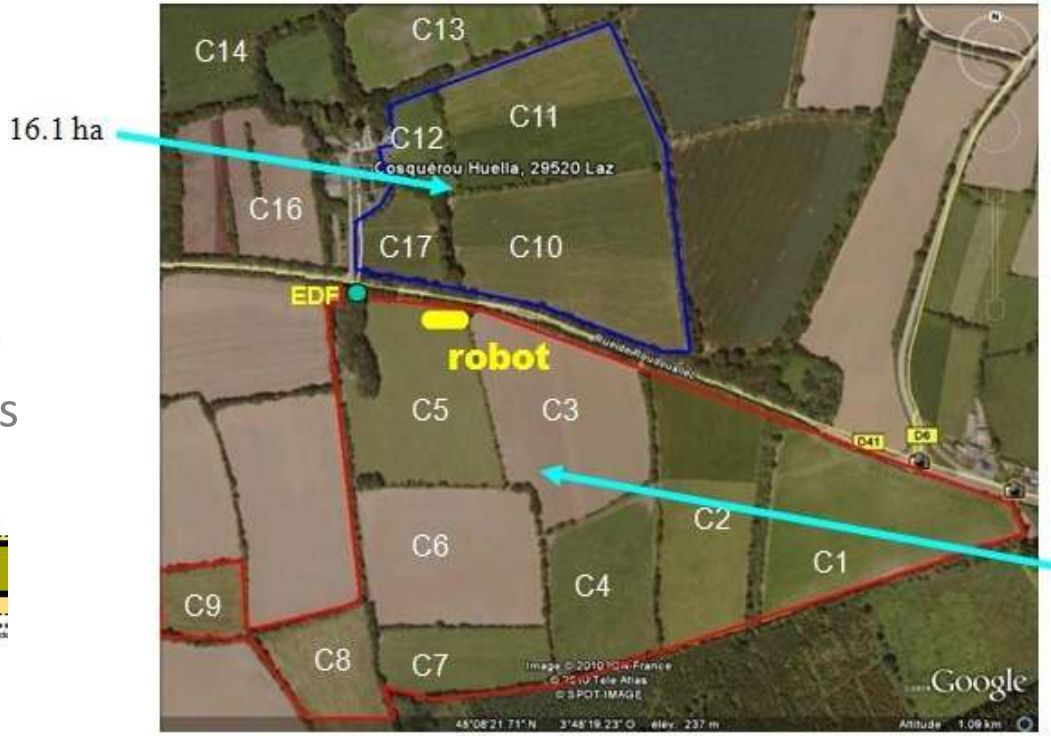
Winter site June 2012

"Innovative building"

The summer location : stabilized platform

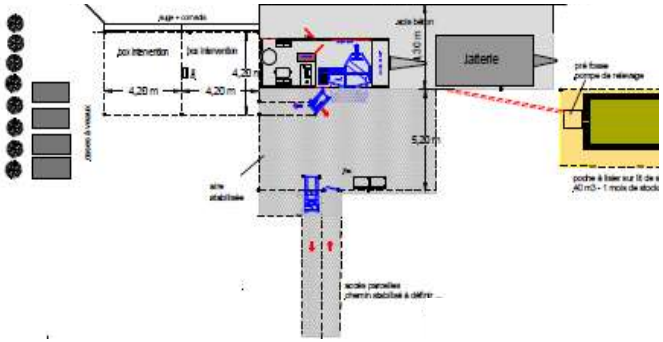
- 0.35 ha grass per cow
- Road crossing if necessary (dry conditions)





road

Access for milkman + tractors

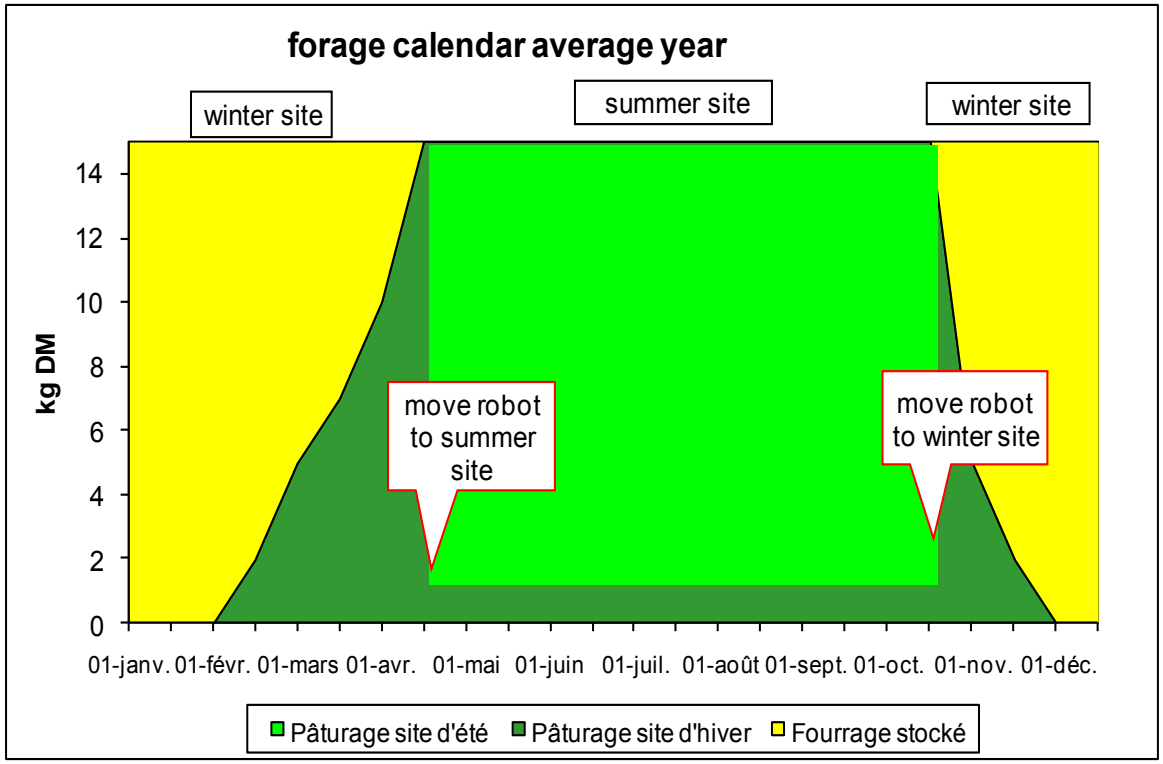


The production system : organic, self sufficient and modern

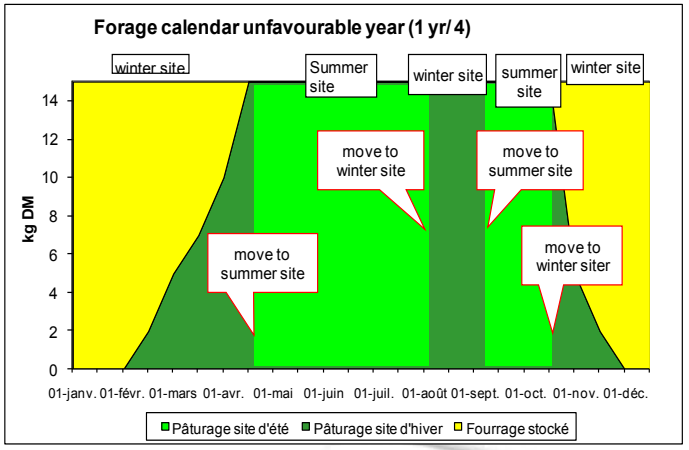
- 45 (…60) Holstein high genetic merit cows
- 8-9 months grazing per year (3-4 months : 100 % grass diet) ; 700 kg concentrate per cow per year
- 7,000 kg milk per cow per yr expected
- Autumn / spring block calvings
  - Where to feed calves ?
  - Ais or calvings in a "remote" area ?
- OAD milking and crossbreeding : future options
- Maximising milk from AMS and grass (not per cow)

The forage system

- In an average climatic year : 2 transfers of cows+robot per year



Dry year : 4 transfers



The targets of the experiments

- Test of a mobile prototype in a remote area : technical issues, wild animals, water and energy supply, WIFI, waste water storage and treatments
- Evaluation and improvement of cow traffic according to fields and tracks design
- Effects of concentrate / buffer feed
- Effect of increased number of cows
- Assess economic efficiency, working time, environmental impacts, acceptability by (organic) farmers, dairy industry and citizens…

State of the project

- **2012:**
  February : robot and trailers ordered
  June : building finished and robot+trailers delivered
  July : start of robot and building in use
  September : first turning out of cows on winter site.

- **2013:**
  February to late April : cows out grazing on winter site.
  Late April : summer site in use

2014: first analytic experiments

Conclusion
The issues around the mobile robot

- Reliability of the prototype
- Milk collecting and milk quality
- …WORKING TIME AND CONDITIONS / COSTS :
  ⇧ fixed vs variable ⇩
- Transfer into other regions : modern version of “transhumance” for mountains areas ?

Poisy experimental farm (Alps)

Thank you for your attention !

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OPEN DOORS 14-15th of June, 2012