WRO™

World Robot Olympiad

PRECISION FARMING

Junior 2018

FOOD MATTERS

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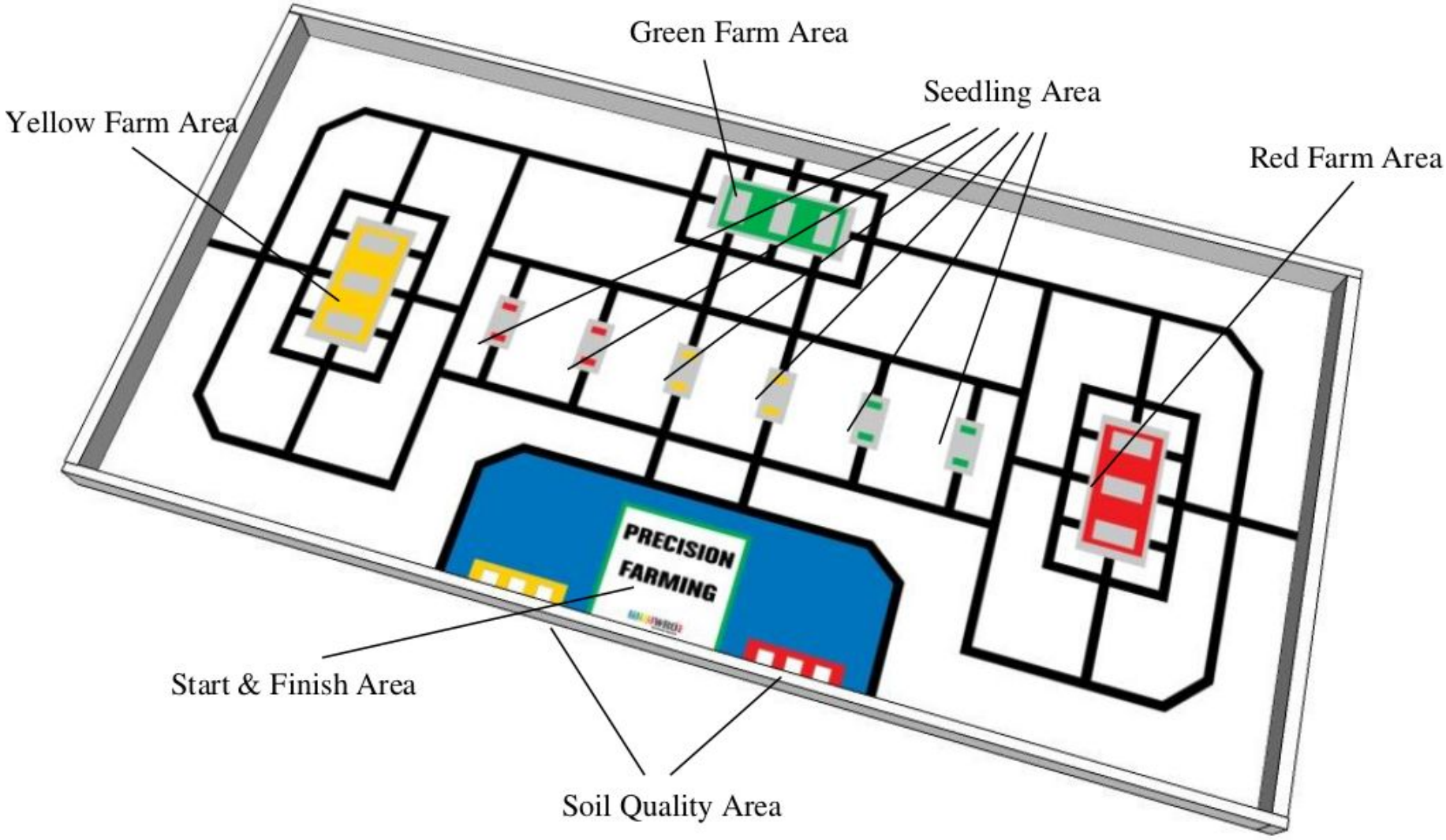
Story

With a growing population in the world, more and more food needs to be produced every year.

One way to get an increased food production is to use technologies like robots, drones, and satellites to improve the usage of arable land. Satellites and drones can provide accurate data on the soil quality of the different areas of the arable land. This data can be used by robots (self-driving tractors) to plant different seedlings on the land depending on the soil quality. In this way, the seedlings are adapted to the growing environment, which will improve the growth of the seedlings.

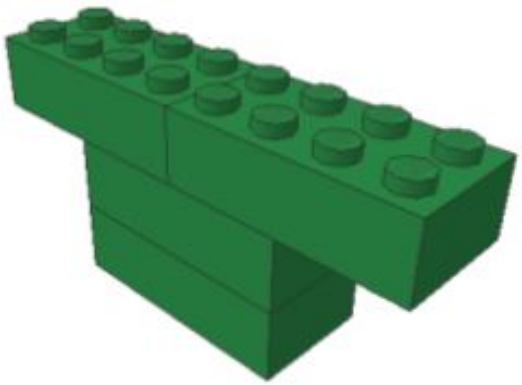
The mission of the robot is to gather data on the soil quality of the fields of different farms and use this data to plant different seedlings depending on the soil quality.

Playing Field

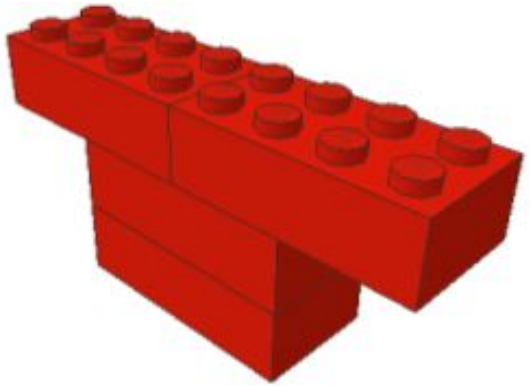


Seedling Area

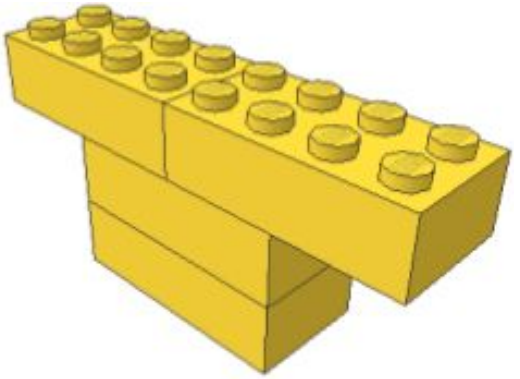
- 3 Types of plants
- 4 plants of each type
- Need to bring plants to corresponding farm area



Green Plant



Red Plant



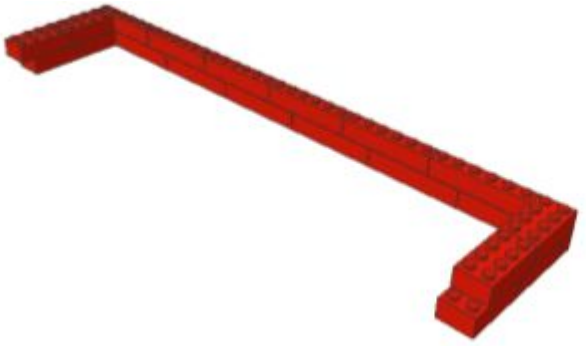
Yellow Plant

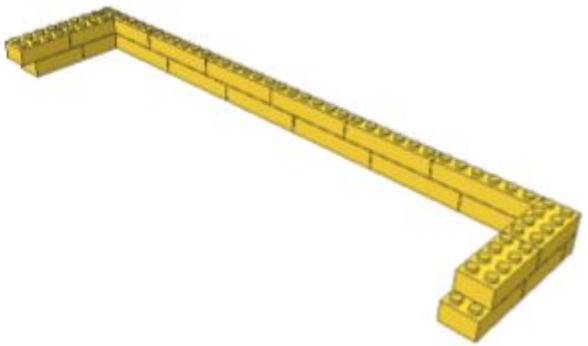
Farm Area

- All Farms protected by walls

<u>Green Farm</u>
- Place 3 green plants

<u>Red Farm / Yellow Farm</u>
- Check Soil Quality First





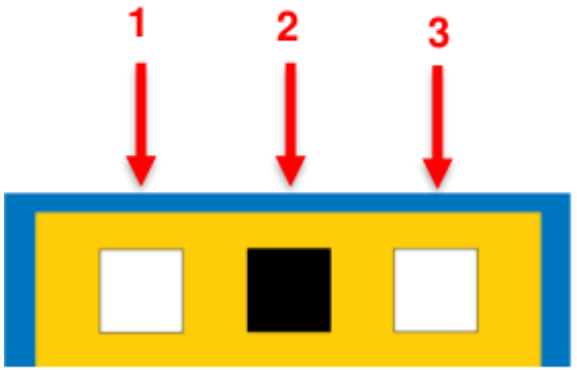
Soil Quality Area

<u>Red Farm / Yellow Farm</u>

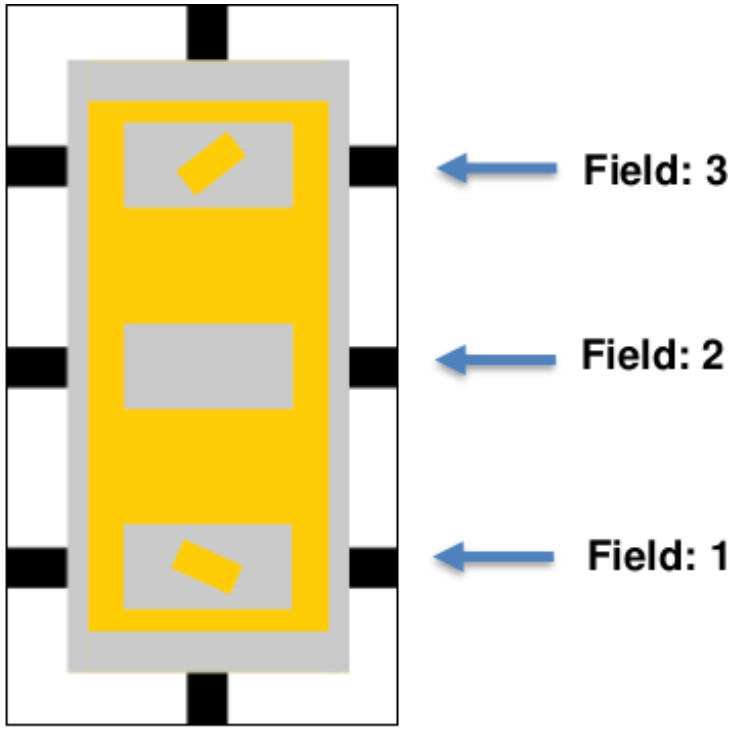
- Only place tree if soil quality is good (white)

White Block

Black Block



The three LEGO Blocks of the yellow Soil Quality Data Area.



Rules

- Only Lego Mindstorm parts and HiTechnic Color Sensor
- Only Robolab, NXT, and EV3 software
- Only one controller
- Maximum size of 25x25x25cm
- Challenge time of 2 mins

Surprise Rules

- Only announced on the morning of the competition
- Example:
  - Added obstacles
  - Additional blocks to move

Scoring

Task	**Points**
Tree in Green Farm (must be upright!)	10 (Completely in box) 5 (Partially in box)
Tree in Yellow and Red Farm (must be upright and matched with soil quality!)	25 (Completely in box) 10 (Partially in box)
Soil quality blocks remain in original location	25
Excess trees remain in original location	15
Farm walls damaged or moved	-5 each
Robot stops within Finish Area	10
Maximum Score	**180**

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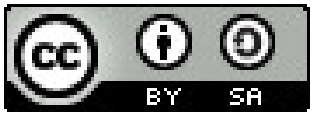

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