

Questions (Submit questions here: <a href="https://goo.gl/forms/INIUDzqva88IB1E83">https://goo.gl/forms/INIUDzqva88IB1E83</a> )	Answers
Possibly someone already raised this question. We are trying to 3D print the pots and plants, but they are very small (2.5 x 2.5 x 2 mm.) We think our Ultimaker printer/ Cura software is having trouble because the parts are so small. Also, the parts must be too small to pick up with a robot. Correct me if I'm wrong, but we think there's a problem here. Maybe they are supposed to be 2.5 x 2.5 x 2 in? Thanks in advance. -CARA	This is a problem of units with the software or printer you are using. Try inches instead of millimeters.
What filament will be used to print the pots and plants in the competition? It would be useful to know in order to have same color shade	Teams may bring their own pots and plants to the competition for use. Any PLA or ABS filament is fine. The competition will provide pots and plants as well, but final printer and material selection hasn't been decided.
Can Raspberry Pi be used? Does it belong to NUC-like or computer devices?	Yes Raspberry Pi can be used, does not belong to NUC-like or computer like devices
If the wireless communication module (Bluetooth, WiFi), network interface, HDMI, 3.5mm headset interface and redundant peripheral chips and components are solidified on the circuit board, but these interfaces and modules are not used during the competition, is it against the rules of the game?	We understand that ready made devices nowadays come with wifi built in. As long as the robot is not communicating with an external computer or any other external devices/server during the competition, having the chip built into the device is fine.
Is the length dimension of the 3D model file inch?	Below is a link to a photo for the plant dimensions in inches. <a href="https://drive.google.com/open?id=1wLSbFcpL3sP1yqQhubzCVsuigMcfYU8S">https://drive.google.com/open?id=1wLSbFcpL3sP1yqQhubzCVsuigMcfYU8S</a>  Depending on what program you used to open the stl file, file might be converted from english to metrics so check that what you print matches the dimension in the picture. Let me know if you can't access the link.
What is the specific type of paint for the playing field?	These were the paint used in last years competition: <a href="https://www.homedepot.com/p/BEHR-Premium-Plus-Ultra-1-gal-Ultra-Pure-White-Matte-Interior-Paint-and-Primer-in-One-175001/203202071">https://www.homedepot.com/p/BEHR-Premium-Plus-Ultra-1-gal-Ultra-Pure-White-Matte-Interior-Paint-and-Primer-in-One-175001/203202071</a>  <a href="https://www.lowes.com/pd/Valspar-2000-Satin-High-Hide-White-Latex-Paint-Actual-Net-Contents-128-fl-oz/50352792">https://www.lowes.com/pd/Valspar-2000-Satin-High-Hide-White-Latex-Paint-Actual-Net-Contents-128-fl-oz/50352792</a>  Any white interior paint/ primer would be fine
Can multiple pots of plants be transported to the storage area at the same time?	Yes that us allowed
How tall are the walls around the beginner's board supposed to be?	Five inches
Do plants from our robot's side need to be placed in the correct storage space before we are allowed to grab the opponent's plants?	No, we will evaluate the scores when the robot stops.
what is the brand/model of the green, red, and black tape used in the board?	No specific brand and model has been selected at this time, but it will be common electrical tape like these: <a href="https://www.amazon.com/Maximm-Electrical-Resistant-Retardant-Waterproof/dp/B07JKK8Y5V/">https://www.amazon.com/Maximm-Electrical-Resistant-Retardant-Waterproof/dp/B07JKK8Y5V/</a>
In the link provided with the 3d plant dimensions it is missing 1) how thick the 3d plant is. 2) how tall the plant is (I know that plant + pot = 4.5") but it would be helpful if the plant height was provided.	Thickness: 2 mm The plant item height: (4.5"-2mm) pot-plant together is 4.5", for plant item we should deduct 2mm thickness of pot bottom.
Are there four types of plants in one round for advanced division?	There are two "species/breeds" of plants, red and green. This is what we define as types. Within those two types/species, plants of each type/species can either be healthy or stressed. Two types, 4 combination: Red Healthy, Red Stress, Green Healthy, Green Stress each of the combination has a desinated storage area. Refer to Full Description-v1.pdf P5-6 for more info.
When the plant is placed in the storage area, must the bottom of the pot be in contact with the storage area?	Yes, both advance and beginner division follow the note on page 5/10 of Full Description-v1.pdf "Only pots that are carried and remain upright until the end of the round will be wligible for points. Any pot that is knocked over will not be counter for any points". If your intention is to have the robot deposit the pots on a flat plate that detaches off therobot then that would also be considered illegal as robot is not allowed to detach into multiple seperate bodies.
After moving the golden plant, is it possible to remove the previously grabbed plants? --> Clarification: After moving the golden plant, can we change the position if we find the previously grabbed plants in the storage area are placed incorrectly?	Yes, as long as there are still plants not in storage area or the 5 min time limit is not reached teams can correct their plant position. Pre-requisite to taking the golden plant is that all pots on your side has been move to the storage area. Pots can be resorted even after golden plant is placed in storage area as initial condition to grab the golden plant was met.

The match will last for 5 min or until all pots have been moved, whichever comes first. In this rule all pots have been moved means that all 21 plants are put into the storage area or just moved?	Put into storage area
Can one robot be transformed into two robots or more after the start of the competition and is there only one robot allowed at the end of the competition?	No, only one robot is allowed per team for the full duration of the match in accordance to the robot dimensional restrictions in the rules. Robots can expand, but not split into two separate units or turn into two bodies simply connected by wire.
The rule states that "sweeping the pots is considered foul". So if the pots are lifted on the robot, and slide on the robot(during sorting), will it be judged as a foul? And when the pots are released from robot to the storage area by using a slideway, will it be judged as foul?	If pots are carried and move within the robot that is not considered sweeping. If pots are deposited by pushing pots out of the robot into the storage area or if pots are moved to make space for more pots, it is not considered sweeping. Intention of this rule is to prevent robots from using plowing/pushing pots on the field as a strategy of moving the pots. Sweeping would be considered something like a broom sweeping the floor when objects are moved purely by pushing without lifting.
Will the shelves be removed for the beginner division for the flowerpot placement area?	Beginner and Advance will have separate boards so there won't be shelves for beginner division.
Excuse me, I can't access the link for the plant.	CAD or plant image?
Are graduating seniors (students graduating in May 2019) who will be attending graduate school in the Fall eligible for the beginner level?	Yes
Are the plants all oriented the same way? How are the plants oriented on the line?	Yes, refer to page 4 of full description V1, "All plants will face the same direction with the leaves parallel to the south edge of the playing field."
If our robot has put the 10 pots in the right place, the opponent put their flower pots in the storage area at random at first, then hold the golden pot without putting it in the storage, at the same time resorting their 10 pots, and finally put the golden pot in the storage to end the game for a higher score but costing longer time. will it be judged as foul?	In short, no. See the next question for complete answers.
<p>To the Organizing Committee of the ASABE Competition:</p> <p>The ASABE Student Robotics Challenge provides a stimulating and fun hands-on learning experience for undergraduate and graduate students to learn and demonstrate their knowledge and skills in agricultural robotics. However, we notice that there is a loophole in the rules of the game - "golden pot loophole"</p> <ul style="list-style-type: none"> <li>Ignore the correctness of the 10 pots placement and randomly place the pot in the storage area to reduce transportation time and hijack the golden pot in advance.</li> <li>Hold the golden pot to prevent the end of the game, then re-sort previous 10 pots, and finally put down the golden pot to finish the game.</li> </ul> <p>Under above circumstances, even if the opponent put 10 pots correctly at a faster speed, he could not get the golden pot first. We believe that the team maliciously uses the "golden pot loophole" to get the golden pot should be judged as foul.</p> <p>Some teams may use this loophole to win the game. This loophole directly hampers the fairness of the game. the Organizing Committee of the ASABE Competition should keep the original intention of the contest, select outstanding teams in robotic design ability, provide opportunities to train undergraduate and graduate students in designing and manufacturing agricultural robots, instead of encouraging opportunism and playing with rules to win.</p> <p>As the World-class Society of Agricultural Robots, it would have a serious impact on the international reputation of the Competition Organizing Committee if this loophole can't be solved fairly. It would also challenge the credibility of the Organizing Committee in formulating rules worldwide.</p> <p>We hope that the organizing committee can properly solve these problems.</p> <p>sincerely!</p>	<p>After reviewing this "golden pot loophole", the committee has agreed that this strategy is allowable, but to balance weightings, two changes will be made:</p> <ol style="list-style-type: none"> <li>1.) The Golden Pot will not have a fertilizing score.</li> <li>2.) The score for collecting and correctly placing the Golden Pot will be limited to 3 points (instead of the original 5).</li> </ol> <p>If a team has made a robot capable of resorting plants (a more complex task since there is no line and accurate spacing), then they would have the opportunity to use that capability. However, all of this would still need to be done within the 5 minutes.</p> <p>We sincerely appreciate the insightful question and we believe that the above will fairly address this. However, we would like to comment that it is not necessary or professional to challenge the reputation and credibility of the committee without evidence of malicious intent. The committee is comprised of members from about 10 different universities and we have sought to be unbiased in forming the rules and making any modifications. Thank you for pointing out this oversight of ours and we hope that this has fairly addressed it.</p>

We analyzed the rules of the competition and found that there are several problems in the setting of score.

- Golden pot score setting is too large
- The cost of misplacing 10 pots is very small.

In the case that completely ignore the color of the 10 pots and Identify only the health of them, Simply move the pots on the line directly to storage and score at least 40 points. However, this strategy can save a lot of transportation time for 10 pots. There is adequate time to hijack the golden pot.

It only needs that the golden pot is placed correctly:

- In the worst case that all neglected healthy 10 pots are misplaced, 47 points can be scored and the probability is very small, about one thousandth.
- In average case that the color of the pot is evenly distributed. The average score is 52.
- In the best case that all the neglected pots are in the right area, the highest score is 57.

Even if the opponent placed 10 pots correctly and applied fertilizer correctly, the highest score was only 50. From the results of probability statistics, it means that the team who grabs the golden pot will probably decide the winning or losing of the game. Correct placement makes no sense. We believe that in the real situation, the correct placement and fertilization is the primary task. The golden pot should be the decisive point between the teams who have put and fertilize correctly, rather than the key point that decides the success or failure directly.

The Golden Pot will not have a fertilizing score. Also, the score for collecting and correctly placing the Golden Pot will be limited to 3 points (instead of the original 5). This should balance weighting better but still allow for different strategies.