We propose constructing a PIC32-powered humidity detection system that is capable of supervising soil moisture levels in domestic agricultural environments. As plants are typically difficult to take care of for the average individual, a relatively inexpensive automated solution could easily gain traction in a less than niche market. Ideally, the product would come equipped with a Wi-Fi shield or other wireless radio transmitter in order to transmit data to the user about incoming plant watering times. Other possibilities include accepting commands over SMTP, watering automatically from a provided water source, or pushing updates directly to a web interface (perhaps for the purpose of managing multiple plants simultaneously from one controller). The primary implementation challenge of this project exists in the low-power nature of it--to be reasonably useful a plant-monitoring device must operate for weeks at a time, which is a good opportunity to properly investigate usage of the low-power features available with the PIC32 architecture.

NEED
- The intended customer for this endeavor is the average individual who would like to get more into home gardening but continually forgets to water plants. This is very likely to be a common problem.
- Both of us have suffered from the issue personally in the past--tomatoes, for instance, are very demanding in upkeep and will suffer if not watered consistently.

APPROACH
- We intend to use soil moisture sensors (which are little more than variable resistors controlled by water content between the probes) to provide reasonably accurate reports about when monitored plants require watering.
- A Wi-Fi shield permits transmission of status reports and reception of commands, such as automatic plant watering/scheduling.
- PIC32 is the architecture of choice here due to its low power consumption technologies allowing for the device to run for long periods unassisted.

BENEFITS
- Sensors are relatively inexpensive ($8 at most, much cheaper in bulk).
- System is easily scalable, with potential to monitor many plants at once from a single controller.

COMPETITION
- Other home automation options available for this issue are typically extremely expensive (since "home automation" is currently a fad).
- Many options use short-range Bluetooth radio or simply make noise when watering is required instead of a more long-term solution.
- Market may appear niche but the problem addressed is actually quite common.