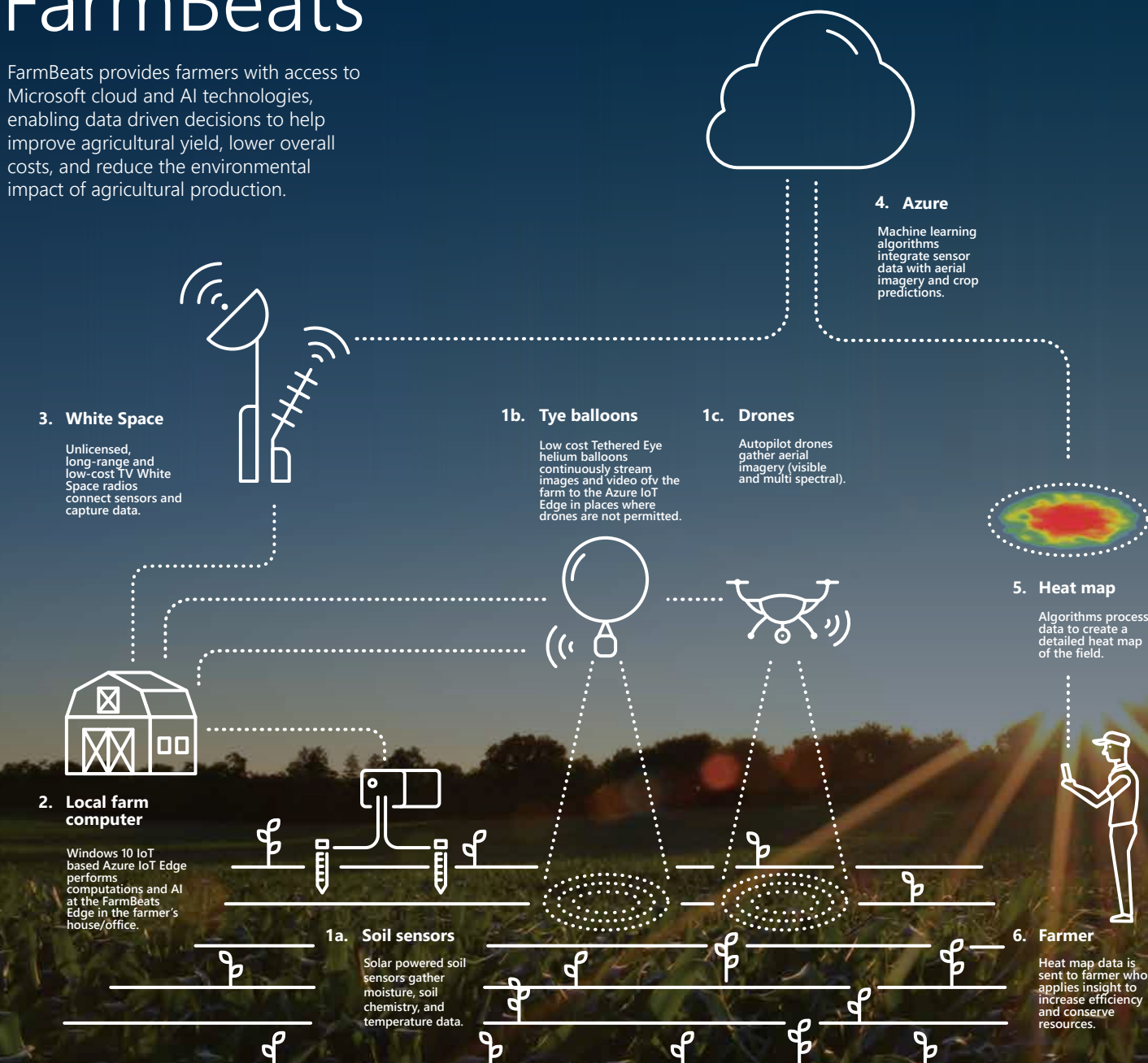AI for Earth

FarmBeats

FarmBeats provides farmers with access to Microsoft cloud and AI technologies, enabling data driven decisions to help improve agricultural yield, lower overall costs, and reduce the environmental impact of agricultural production.

4. Azure

Machine learning algorithms integrate sensor data with aerial imagery and crop predictions.

3. White Space

Unlicensed, long-range and low-cost TV White Space radios connect sensors and capture data.

1b. Tye balloons

Low cost Tethered Eye helium balloons continuously stream images and video ofv the farm to the Azure IoT Edge in places where drones are not permitted.

1c. Drones

Autopilot drones gather aerial imagery (visible and multi spectral).

5. Heat map

Algorithms process data to create a detailed heat map of the field.

2. Local farm computer

Windows 10 IoT based Azure IoT Edge performs computations and AI at the FarmBeats Edge in the farmer's house/office.

1a. Soil sensors

Solar powered soil sensors gather moisture, soil chemistry, and temperature data.

6. Farmer

Heat map data is sent to farmer who applies insight to increase efficiency and conserve resources.

Challenge

Several studies have demonstrated the need to significantly increase the world's food production by 2050. However, there is a limited amount of additional arable land, and water levels have also been receding. Our goal is to enable data driven farming. We believe that data, coupled with the farmer's knowledge and intuition about his or her farm, can help increase farm productivity, and also help reduce costs. However, getting data from the farm is extremely difficult since there is often no power in the field, or Internet in the farms. As part of the FarmBeats project, we are building several unique solutions to solve these problems using low-cost sensors, drones, and machine learning algorithms.

Solution

FarmBeats uses TV White Space (TVWS) radios to wirelessly connect sensors and capture data; and machine learning (ML) algorithms to integrate sensor data with aerial imagery and other relevant data (such as weather, crop predictions, and best practices) to deliver actionable insights to farmers, all at a fraction of the cost of existing solutions. Our collaborators, the government of India, the Gates Foundation, and leading agricultural companies, such as BASF, Bayer, Land O'Lakes, and Mahindra, are crucial to this effort, and support our longstanding commitment to sustainability. This is a digital transformation of agriculture, at both small and large scales, that's critical to meeting 21st century food-supply challenges.

Agriculture   Water   Biodiversity   Climate change

■■ Microsoft