CHAPTER 5

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#### BEFORE YOU START What do you know about robotics? Have you had any experience of videogames showing robots?

hile the banking and automotive industries implode, fruit and vegetable growers are fending off<sup>2</sup> a financial crisis of their own. Tough immigration laws, among other factors, are shrinking the labor supply for picking delicate crops. As part of unofficial bailout<sup>3</sup>, the USDA (United States Department of Agriculture) recently awarded \$ 28 million to Sanjiv Singh and other researchers of Carnegie Mellon University to build automated farming systems that will improve fruit quality, shore up<sup>4</sup> worker shortages and keep American farmers solvent<sup>5</sup>.

The researcher team are field-testing future farmhands on a patch of ground just outside Pittsburgh. Autonomous fourwheelers rumble<sup>6</sup> through apple orchards, using sensors to scan for things like fungus and growth rates. Separate sensors in the ground monitor soil moisture, humidity and light levels.

"People who own thousands and thousands of acres simply can't monitor all of their crops" Singh says. In the future, farmers could micromanage every plant from a central station, and dispatch robots to deal with pest invasions or soil imbalance before any fruit starts dying.

# Use robot labor<sup>1</sup>

Someday, robots could replace humans for picking delicate fruits and vegetables

But can robots roll up their figurative sleeves and pick fruit? Vision Robotics, a company in San Diego, thinks so. It's building scouting robots that use multiple stereo cameras to locate and size the fruit in the trees. For now, the speed and accuracy of the machines still lag behind their human counterparts, and they still cost far more to employ. For Singh, that's a drawback: "It would be 15 minutes before farmers would start asking 'How much does it cost?' If a robot is 10 times as expensive as a human, then it won't work".

The near-term practical answer, he argues, is machines that allow fewer people to do more work - scissor lifts for better access to treetops, automated pruning devices, robots that stack and transport boxes and, of course, a sensor network to keep it all in sync<sup>7</sup>.

Adapted from *Popular Science* August 2009

#### Notes

- 1. **Labor**: the American spelling of Labour;
- 2. **to fend off**: to deal with a difficult situation;
- 3. **bailout**: financial help given to someone who is in difficulty;
- to shore up: to help or support something that is not working well or is likely to fail;
- 5. **solvent**: having enough money to pay all your debts;
- to rumble: to move slowly along while making long low sounds;
- 7. **in sync**: working well together in a synchronous way.

### → EXERCISES

### A Match each of the following headings with a paragraph in the article:

[....]

[ ]

[....]

- **1.** *Vision Robotics* is manufacturing scouting robots
- **2.** Financial crisis of the fruit and vegetable growers
- Future farmhands are tested by Singh and his team
- 4. Singh's practical answer

#### B Answer these questions.

- **1.** Why is the labor supply for picking delicate crops on crisis?
- **2.** What are the aims of the Carnegie Mellon University's researchers?
- **3.** Describe the work that is carried out by future farmhands.
- 4. How are separate sensors used and why?
- **5.** What will happen in the future to monitor the crops, according to Singh's opinion?
- 6. What is Vision Robotics building at present?
- **7.** What are the disadvantages pointed out in using robots to pick fruit?
- 8. What is Singh's near-term practical answer?

#### C Complete the following sentences with the phrases in the box below: sensor networks - four-wheelers – field-testing –

specialty-crop industry - deal with

- **1.** Some..... are spreading off around the field to scan for things.
- **2.** A lot of people are employed for ..... on a patch of ground.
- **3.** *Vision Robotics* is ..... scouting robots using stereo cameras
- **4.** In the States the ..... has a remarkable value since it is referred to produce that everyone can afford.
- 5. In a short time a lot of workers will be replaced by

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### Complete the following passage and fill in the blanks with only one word: The value of the specialty-crop industry is \$55 billion. This industry is concerned (1) ...... apples, grapes, pears (2) ...... other delicate

produce, which relies (3) .....a declining number of available number of human hands

(4) ..... harvest. The solution could be

mechanized farmers (5) ..... monitoring,

pruning, thinning, (6) ..... even picking

produce. (7) ..... potential is domestically

grown fruit and veggies (8) ..... everyone can afford.

## E Write a summary of about 80 words exploiting the following points:

- **1.** The situation of labour force related to the specialty-crop industry.
- 2. The introduction of mechanized farmers to compensate labour shortage.
- **3.** Advantages and disadvantages in the use of scissor lifts, robots and sensor networks.

#### **Oral Practice**

- F Think of the problem examined in the passage related to the situation in Italy. With the help of the Net and your teacher of science collect the results of your survey and present a short presentation covering the main points contained in the article:
- **1.** The situation of labor supply
- The advantages and disadvanges in the use of robots in agriculture mainly related to the cost of sensor networks.