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Immigrant Labor or Machines?

Why Automation Remains A Poor Replacement For Low-Skill Workers

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SALINAS, Calif. -- Why don't U.S. employers just automate the low-skilled jobs that now attract illegal immigrants?

Steve Scaroni's lettuce harvester provides part of the answer. At the height of the lettuce season here, the romaine harvester that Mr. Scaroni designed and built at an out-of-pocket cost of \$1 million sat in the shop, idled by a design flaw that allowed too many lettuce heads to roll back into the field.

Mr. Scaroni's company, Valley Harvesting & Packing Inc., harvests a million pounds of lettuce daily. Even when it's working, the harvester -- a bandsaw, sweeper and conveyor belt on tank-like tracks -- cuts Mr. Scaroni's labor needs by only a quarter. And with a delicate crop like lettuce, the machine causes too much bruising for anything except bagged salad mixes.

With the country deeply divided over immigration, some economists and policy makers are suggesting that technological innovations could offer a way out of the economy's reliance on illegal workers. But as Mr. Scaroni's troubled lettuce harvester shows, it's unlikely that mechanization will reduce the demand for illegal immigrants anytime soon. For most of the jobs they do, there's no easy high-tech substitute.

Illegal immigrants make up an estimated 5% of the U.S. work force, but more than one-quarter of the people who pick crops, hang drywall, shingle roofs and process food. Those jobs are drawing 500,000 low-skilled workers to the U.S. each year.

Immigration restrictionists, among others, point to the success of mechanical tomato harvesting when the Bracero guest worker program for seasonal Mexican farm workers ended in 1964. Since then, harvests of tomatoes that go into processed foods have quadrupled, while labor use has dropped by 72%, says the Western Growers Association, a California trade group.

Some other industries that rely on low-skilled labor also have mechanized. The poultry industry now uses machines to catch, kill, pluck and eviscerate chickens. The housing industry is moving more work onto factory assembly lines.

But labor economists say that's not much headway. "What struck me was how few examples there were of employers thinking ahead," says University of California at Davis economist Philip Martin, who spent a month last year looking for innovations that lessen U.S. reliance on illegal, low-skilled labor, and found almost none.

Much of the problem, he says, is that guest worker proposals circulating in Washington are "sending the signal that the supply of unskilled labor will continue" to be high. That has largely dissuaded government and industry from investing in research and development, he adds.

The Agriculture Department -- which helped pay for the tomato-harvest research at UC Davis -- ended all funding for mechanization in 1979 after unions representing agriculture workers sued the university for endangering their jobs.

Salinas's lettuce farmers began mechanizing a decade ago, using machinery with a broad blade to mow whole fields of young spinach. But the head lettuces pose a bigger challenge than greens, which are packaged whole and sold as "spring mix." Mr. Scaroni's romaine workers cut and core each head as they move through a field, slice off bruised leaves, rinse the core to prevent discoloration and toss the lettuce onto a conveyor belt, which deposits it into huge plastic-lined boxes.

Mr. Scaroni, 49 years old, needs 1,500 workers to meet his harvesting contracts in the summer season and 700 in the winter, when he moves his operation to the U.S.-Mexico border to work the lettuce crop there. Last year, he says, he began to worry that political pressures to cut illegal immigration would leave him without a work force. Federal law requires that he ask his workers for identification and U.S. work authorization, although he's not obliged to assess their authenticity, and the use of forged documents is widespread in the agriculture industry. Mr. Scaroni says that to the best of his knowledge he doesn't employ any illegal workers.

Under current law, there's almost no way for an unskilled worker to legally immigrate on a work visa. Meanwhile, Mr. Scaroni says, his longtime legal-immigrant workers are leaving the fields for skilled jobs in his company, or for higher-paying construction work.

Working with two engineers at a Salinas fabricating shop, Mr. Scaroni spent two months designing his lettuce harvester on a computer last winter and another four months building a prototype. This past summer, he moved his finished harvester into the fields.

The machine slices off the romaine heads a few inches above the ground and sweeps them onto an inclined conveyor belt. A driver maneuvers it through the field, and a half dozen workers sit on a platform at the top of the belt, trimming the lettuce before it is tipped into boxes.

The machine cuts human contact with the lettuce and is washed with chlorine nightly, making it potentially safer than hand-picked methods that could spread disease, he says.

But the angle of the conveyor belt was too steep, and adjusting that flaw cost \$50,000 and took the harvester out of service for two weeks. In addition, mechanization tends to bruise the lettuce.

Working without industry or university help, "we had no way to validate the design," sighed Mr. Scaroni.

Mr. Scaroni's machine reduces labor only 25% because much of the trimming and inspection that otherwise would be done in the fields has now been moved inside a processing plant. "Cutting the lettuce is easy," says Mr. Scaroni, but "someone's still got to put their eyes on it."

That problem stymies mechanization of other crops. With the development of new plant varieties, a lettuce field now matures uniformly, which means that laborers can harvest it in one pass.

But other crops mature progressively -- laborers now go through a cantaloupe field up to 10 times to cut produce as it ripens. Automating that harvest would require robots that can distinguish colors and leave green fruit behind. California citrus growers have a small robotics research project, says Jim Thompson, a UC-Davis agricultural engineer. But a prototype robot will cost \$6 million, and without research grants, "they're not getting there very fast," he adds.

Even where machine harvesters have been developed, the damage and bruising they cause excludes their use on fresh foods like apples, table grapes and salad tomatoes.

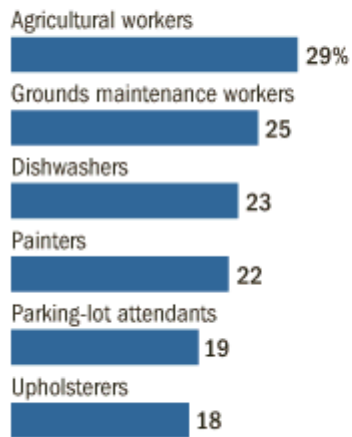
With an immigration bill far from passage, the Western Growers and some other farm groups have turned their attention to an upcoming farm bill. They want some of the money that now goes into grain subsidies to be used for fruit and vegetable research, including mechanization. But that bill is still at least a year away.

So Mr. Scaroni has begun shifting some of his operation to central Mexico -- and with it, some of the business he once gave to Salinas merchants. Consumers want lettuce, "and somebody's got to cut it," he says

No Substitute

Illegal immigrants account for 5% of the U.S. work force, but represent a much higher share of workers in some industries:

4



Source: Pew Hispanic Center



*Valley Harvesting and Packing Inc.'s **lettuce harvester** has failed to significantly supplant the company's manual-labor needs*