Just an hour and a half north of Silicon Valley, home to the vast campuses of Facebook and Google, Nick Papadopoulos is running a startup out of a barn. Under a chandelier made of recycled wine barrels, two laptops perched atop wooden slab tables account for the bulk of the assets of his company, CropMobster. A dusty pommel horse sits in a corner of this grange turned office not far from the woodstove his four co-workers use for warmth when the weather turns. In this unconventional space, Papadopoulos is laboring to find a profitable solution to a multibillion-dollar problem: food waste.

Papadopoulos, a former consultant, runs a seven-month-old firm that is a sort of Match.com for produce, pairing farmers who have surpluses with food banks, restaurants and home cooks who need inexpensive tomatoes and peaches, to cut down on needless spoilage. The Natural Resources Defense Council (NRDC) estimates that 40% of food in the U.S.--worth some $165 billion--goes uneaten every year. That's a 50% increase since 1974, the earliest government data available.

There are plenty of reasons waste has worsened: Farmers grow too much as a hedge against uncertainty. More food is thrown out when distributors reject slightly bruised or misshapen fruits and vegetables. Grocery stores often overstock to keep their displays looking bountiful. And consumers toss perfectly edible produce at home, often by mistake. Food now takes up more space in landfills than paper or plastic. The resulting buildup of decomposing organic material accounts for 16% of environmentally harmful methane emissions in the U.S.

Goaded by drastic improvements in logistics and a desire to chip away at social issues like hunger and climate change, entrepreneurs are trying to find ways to solve the problem of food waste. CropMobster isn't the only one. There's Washington, D.C.--based Food Cowboy, which reroutes food rejected by distributors. Daily Table, founded by former Trader Joe's president Doug Rauch, is turning bruised-but-edible food into meals that can be sold at a low cost. And a raft of appmakers are targeting consumers in hopes of changing the way they plan meals and shop for groceries.

While most such ventures are still small, their founders believe technologies such as online marketplaces and nearly ubiquitous GPS can help wring inefficiencies out of the food market. (Big companies think so too; Amazon is plotting an expansion of its nascent grocery-delivery business on the basis of some of the same principles.) "In my years consulting, I've never seen such massive waste," says Papadopoulos, 38. "It would be like if 40% of the smartphones that came off the conveyor belt were just thrown out."

Papadopoulos, who runs a family farm in Petaluma, Calif., got the idea for CropMobster on a Sunday afternoon in April, while sipping a beer and looking at cauliflower, leeks, kale and other vegetables that hadn't been sold at that day's farmers' market. He posted a picture lamenting the would-be waste on Facebook, and a few hours later, one of the farm's social-media fans came to take the leftovers to share with her neighbors. Seven months later, via its website, CropMobster has brokered sales of about 100,000 lb. of food from area farms. (The name refers to the agricultural term crop mob, farmers who don't own land but volunteer to work for others.)

CropMobster, which isn't currently profitable, funds itself through donations solicited online. But Papadopoulos says the company can eventually generate revenue by charging a small commission on transactions.

The way food is shipped is also creating opportunities. A report from consulting firm Oliver Wyman estimates that up to 1 in 7 truckloads of perishable goods delivered to supermarkets gets thrown away, amounting to 34 million tons of food lost every year. A truck driver for over 25 years, Richard Gordon founded Food Cowboy a year and a half ago with his brother Roger and Barbara Cohen, a public-health and nutrition expert. The for-profit firm reroutes rejected food deliveries otherwise bound for dumpsters to food banks and charities across the country. Truckers can sign up on Food Cowboy's website to receive alerts about nearby drop-off locations. The startup then notifies a local food bank, for
example, of an impending delivery. The company charges food banks 10¢ per pound, about a third of the going rate.

Food Cowboy recently caught the attention of the U.S. Department of Agriculture, which asked the company to help form a national technology-innovation council to find solutions to food waste. (So far, legislation has done little to address the issue.) Other members include Google Ideas—the search giant's in-house think tank—and the Grocery Manufacturers Association.

Some ventures are betting they can profit by selling excess food directly to consumers. Rauch, who was a Trader Joe's executive for over a decade, will launch his first Daily Table store in Dorchester, Mass., in April. The firm will take the bruised peaches, oversize tomatoes and crooked cucumbers rejected by other chains and sell them at discounted prices. Daily Table will also sell takeout meals made from imperfect fruit and veggies and priced to compete with fast-food restaurants. Rauch says a gallon of milk will cost $1, less than a third the national average, to compete with soda prices. (The milk will be donated overstock from local markets, not expired.) Rauch has raised over $1 million from the Robert Wood Johnson Foundation, the Boston Foundation and others.

Newcomers will be joining a number of established companies and programs. FoodStar, a California for-profit, organizes flash sales of aesthetically challenged food. Bi-Rite Market, a popular organic store in San Francisco and a CropMobster client, created a kitchen in its store to cook would-be wasted food into meals to sell or give its staff. "We've been so conditioned to look for the perfectly polished, perfectly shaped apple. When you see something with a scab on it, you shy away from it. But that's usually the fruit that's the most flavorful," says Sam Mogannam, Bi-Rite's chief. Mogannam has become a spokesman for the trend.

Other startups are aiming to change consumer behavior. Appmakers have particularly targeted users trying to save money. The 222 Million Tons iPad app—named for the amount of food wasted in industrialized nations each year—allows users to plan meals for their families and buy exactly the right amount of groceries that week. Another, Green Egg Shopper, allows people to track when the foods they purchase will go bad, sending alerts to encourage using up soon-to-expire ingredients.

But consumers may not be that easy to persuade. Outfits like Daily Table have to convince shoppers that they're not just buying someone else's rejected food. (Rauch counters this by asking, "If you shop at TJ Maxx, do you feel like you're getting expired clothing?") Consumers also have financial incentives to buy in bulk at big-box stores like Costco—even though that can sometimes be wasteful. And according to a Harvard and NRDC report published in September, people often read sell-by labels meant for store owners as the date when products go bad, though many times they may stay fresh for days, weeks or even months longer. As a consequence of label confusion, the average U.S. household discards $275 to $455 worth of perfectly good food a year. Total losses from food waste for a family of four average $2,275 a year.

Perhaps even more vexing is a lack of venture funding for such startups. Most firms like CropMobster and Food Cowboy are supported by charitable foundations or community donations. Even the most innovative programs will need large-scale, profit-minded backing to grow. That doesn't seem to deter CropMobster's Papadopoulos, though. "It's going to take a network of innovation to tackle this issue," he says. "One silver bullet won't cut the mustard."

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