

# Healthy soil

is the basis of our growers' livelihoods

## The quiet revolution

A quiet revolution has been happening across U.S. cotton farms. It is a revolution whose soundtrack is the gentle flutter of butterfly wings, the buzzing of bees, and a symphony of other wildlife, scented and colored by an abundant pollinating floral tribute. **It is a philosophical revolution that promotes plant, animal and microorganism interaction above and below ground.** It is the revolution of the inexorable march of biodiversity and regenerative practices that are spreading across American cotton farms, to the benefit of flora, fauna and farmer alike.

## A whole-farm approach

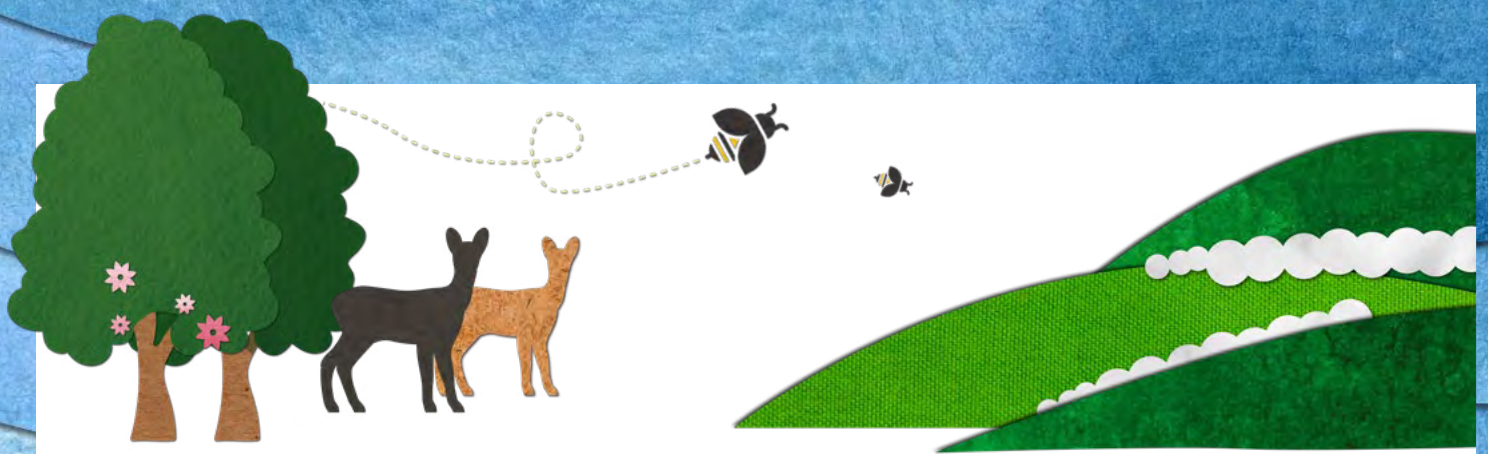
Taking a whole-farm approach means thinking about biodiversity and cotton farming inclusively and together, rather than as mutually exclusive or even competing approaches. It's about appreciating the benefits — both evident and as yet unknown — that a whole-farm approach can entail.

As Sledge Taylor, a cotton grower in Mississippi put it, "it's better to take a holistic approach on a farm as there are many benefits that we may not even understand yet. That's why we're incorporating biodiversity into a whole model."



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A whole-farm approach includes setting aside in-field corridors and buffer zones bordering cotton fields that are allowed to grow back wild with native plants.

These create natural habitats and food sources not just for bees, butterflies and small birds like quail, but also for larger species like deer. Implementing field borders with perennial grasses and wildflowers allows pollinator species to thrive and improves the habitat quality for adjoining cotton-farmed areas which is beneficial for the crop itself. Typically, farmers may set aside land that is less efficient, or with more challenging terrain, which allows them to focus on the most appropriate land for cotton production.

## Minimum-tilling and cover crops

In addition to setting aside land to promote natural habitats, U.S. cotton farmers are increasingly adopting minimum- and no-till practices, and the use of cover crops, both of which also have a massively positive impact on biodiversity and soil health. Minimum and no-till systems improve soil structure by promoting a diversity of micro-organisms that have a symbiotic relationship with the cotton plant roots. By leaving soil intact, and not turning it over carbon is retained, reducing the GHG impact. Combined with minimum- and no-tilling practices, the use of winter cover crops also contributes to removing carbon dioxide from the atmosphere. The land is covered in plants all year round, doubling its CO<sub>2</sub> extraction potential.

Cover crops are hugely beneficial to biodiversity and soil health in other ways, as well as reducing other inputs. For example, at planting time for cotton, the residue left over from the cover crop serves as a natural

mulch to decrease evaporation, conserve moisture, and prevent soil erosion. “We see the difference for example in the heat of the summer between land that had been planted with cover crops and those without, where the land with residue from the cover crops will be cooler and also have greater moisture retention,” as one Louisiana cotton farmer put it.

The roots of cover crops like radishes help break through compacted soils, and the earthworms that abound because the mulch from cover crops provide them with shade and food, also loosen and naturally aerate the soil. This in turn allows for better water absorption and less water run-off. Species like hairy vetch extracts nitrogen from the air and makes it available for the cotton crop, and the early-spring-flowering crops are a boon for pollinators that proliferate wherever cover crops are routinely used.

## As little as possible and as much as strictly necessary

Indeed in this whole-farm approach, pesticide usage is kept to a minimum. Taking a holistic approach to biodiversity, U.S. cotton farmers have learned not only how cover crops can help control pests, but also that they can tolerate some pests for some time. Growers carefully manage when and how they need to protect their crops from pests using an integrated approach. They track and identify pests that affect their crops and focus on prevention, using pesticides only as a last resort. Normalized difference vegetation index (NDVI) technology allows farmers to identify and understand the very specific

areas where intervention is needed. So instead of spraying a whole field with a pesticide, only the affected area identified through NDVI is treated through a very surgical local application. “We’re talking ounces per acre,” as Louisiana farmer Marshall Hardwick has put it. Keeping pesticide use to the strict minimum necessary through local spot application means it has a minimal impact on and helps enhance the farm’s broader biodiversity. And it makes good business sense too, when the cost of a gallon of pesticide can run into the thousands.

## Tailoring efforts to farmers’ needs

Cognizant that every farmer’s needs are different, increasing biodiversity on American cotton farms can only be done in full conversation with individual farmers. It cannot be achieved through a blunt one-size-fits-all approach. That’s why organizations like Quail Forever and Pheasant Forever are working hand-in-glove with growers to help them develop the systems that are suited to their particular needs. Often, it’s as simple as discussing the benefits farmers

and that enhancing biodiversity doesn’t mean adding costs to their operations. For example, growers can get financial support to help them set aside land and increase the biodiversity on their farms through a range of conservation programs with the Natural Resources Conservation Service through the United States Department of Agriculture, meaning investing in biodiversity remains a win-win for all.

## Reaping the rich rewards

And the payback is massive. Dr. Mark McConnell, assistant Professor of Uplands Birds at Mississippi State University reported an example where setting aside an additional 4% in habitat field borders resulted in a 23% increase in the wild quail population. Farmers who promote biodiversity report that wildlife is abounding – not only bees and butterflies, but rabbits and deer, turkey and quail, and “even Canada geese we’d never before seen this far south and many species returning that I hadn’t seen as a child”, as one Mississippi farmer has put it. Those include black bears, panthers, coyotes, and bobcats.

These rich rewards in biodiversity are motivating ever more U.S. cotton farmers, as stewards of the land for the next generations, to take on a whole-farm approach. And there are also some welcome knock-on economic benefits too. Not only in terms of fewer inputs like less irrigation or fertilizers, saving precious resources and money, but also in terms of productivity, with farmers reporting how better soil health achieved through biodiversity practices has resulted in higher yields.

**So as they may say down in Louisiana,  
vive la revolution!**