Many people think of agriculture as a tradition-bound occupation. It is far more like information technology, as high-tech companies genetically engineer seeds and a few powerful companies strive to dominate the market. Following a decade of unchecked consolidation, it is time for the Justice Department to take a hard look at potentially anticompetitive behavior.

A good place to start is with Monsanto, which is trying to block DuPont from adding its own genetic traits to Monsanto’s Roundup Ready technology to produce soybeans that would be resistant to multiple pesticides. Seeds carrying Monsanto’s genes can resist Roundup, the ubiquitous weedkiller. They are the dominant standard in American fields — present in 97 percent of the soybean crops and 79 percent of the corn, akin to Microsoft Windows on computers.

Earlier this year, Monsanto sued DuPont for patent infringement. In response, DuPont accused Monsanto of hindering innovation through restrictive licensing agreements. It also charges that Monsanto is pre-empting competition from generic makers by threatening to revoke seed companies’ licenses if they don’t switch to a new version before Monsanto’s patent expires in 2014.

Monsanto denies the allegations. It says that it regularly allows other companies to stack their genetic traits onto its own and that DuPont could have signed such a license. It also says that farmers are switching to the new anti-Roundup technology because it improves yields.

We don’t know who is right, but we do know that these charges need to be fully investigated.

Monsanto has never been shy about going to court to defend its dominant position. Regulators are certainly concerned. In 2007, when Monsanto bought a cotton-seed maker, Delta and Pineland, the Justice Department’s antitrust division required it to remove license provisions forbidding rivals from stacking Monsanto with non-Monsanto traits.

The antitrust division will not say if it is investigating Monsanto. But in recent months, it has asked Monsanto and its competitors for information to determine whether Monsanto is breaching antitrust laws.

Agriculture is at the frontier of technological progress. Its innovations will determine, to a large extent, whether and at what cost this country and the world will be able to feed its growing populations. No company should dominate such an essential business.