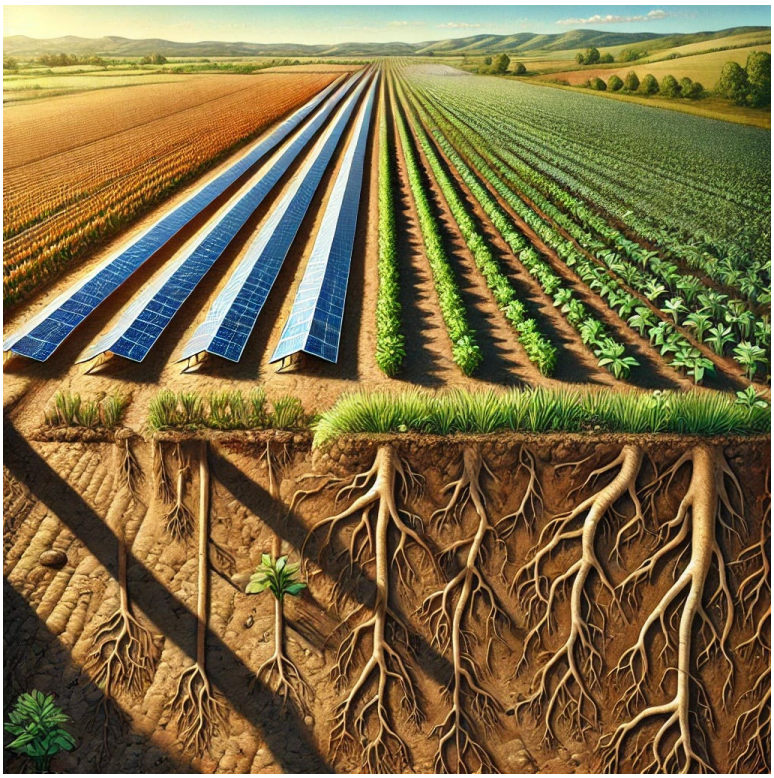
Big solar farms may be stressing agricultural ecosystem



The following is an article from The North Carolina Journal:

Ron Heiniger isn't afraid to get his hands dirty. He has spent years as a crop and soil scientist helping hard-pressed farmers to get maximum yield and quality from their crops. The N.C. State Cooperative Extension Service professor says it's his calling in life.

These days Heiniger, who works at the Vernon G. James Research and Extension Center in Plymouth, worries that solar installations gobbling up prime farmland could do more to destabilize and diminish the agricultural economy of North Carolina than any naturally occurring threat that he deals with.

"*We really don't recognize how fragile our agriculture system is. Today it's under stress*," mostly from low prices, and to some degree due to young people abandoning the farming life of their fathers, Heiniger said.

Utility-scale solar energy facilities are increasing the pressure on farming by taking land out of production needed to maintain a delicate economy of scale, viability, and profitability. At some stage the system will start to break down, but the question is when the decline reaches a point of no return, he said.

Some farmers struggling to make a living off the land yield to the temptation to enter a lucrative lease with solar companies, and take part or all of their fields out of production.

But many farmers depend on leasing neighboring land from absentee owners or non-farmers to grow crops and graze animals. Those landowners are increasingly finding it more profitable to lease to solar installations, cutting tenant farmers out of fields needed to stay in business.

For that reason, the spread of solar installations across the farm belt doesn't necessarily help farmers to remain viable, as the solar industry claims. Often it makes it more difficult, Heiniger argues.

If farmers lack sufficient land to remain viable, they will leave the field, literally. That will create a tumbling domino effect, Heiniger said.

"*What's going to happen to the equipment dealer, feed retailers, fertilizer distributors, people who bring in limestone on rail cars and by the truckload?*" Heiniger asked. "*They're not going to be in the business*."

If enough farmland is taken out of production, the infrastructure would collapse, and grain and animal production would move to other states or offshore. By the time 20-year solar installation leases expire it would be extremely difficult to recreate the agriculture infrastructure from scratch, Heiniger warns.

"E*verybody tells me that that's the worst-case scenario. Perhaps it is, but we have lots of examples of that,*" Heiniger said, pointing quickly to the disappearance of most of North Carolina's dairy farms following a government buyout program as one example. The buyout program ended a decade ago, but small dairy farms never revived.

"*I think it's a fear that needs to be addressed as they think about the solar industry disrupting the agriculture community*," he said.

But many county commissioners lack sufficient knowledge about the complex interplay of solar installations on the economic, ecological, environmental, and

cultural dynamics of a community as solar companies woo them for siting approvals with promises of jobs and revenue.

"*Right now it's neighbor against neighbor, commissioner against solar that's sort of being played out in these little communities,*" Heiniger said. "*I don't know if I've seen rural people get as upset about an issue as they have over these solar and wind issues. … It's just a real battlefield out there*."

Currituck County even enacted a solar installation ban after the issue blew up among residents there.

The solar industry minimizes environmental concerns, Heiniger said. While he is neither a solar opponent nor an alarmist, he said long-term issues must be addressed with dispassionate scientific research.

Many solar panels are supported by galvanized steel platforms. That steel oxidizes over time and releases zinc into the soil, which can be toxic to plants at certain levels.

That has been documented in cases where other types of galvanized steel structures were removed, and crops didn't grow, or didn't fare well, Heiniger said. Significant soil remediation had to take place to return that land to production.

It is uncertain if the solar panel structures would have that same effect, but it is something that demands study, he said.

Most cropland in North Carolina must be spread regularly with alkaline limestone to neutralize their inherently acidic nature. Solar installations do not perform that practice, and after 20 years or more of nonagricultural use the acid content of soil would spike.

A farmer wanting to reclaim the land would have to make a significant investment in limestone and other nutrients. Whether that would be economically feasible would depend on agriculture prices being high enough to sustain the outlay, Heiniger said.

The data shows the solar panels "*channelize water*," causing it to leave the site faster, and infiltrate neighboring properties, Heiniger said. Some farmers have confirmed their fields became wetter than before the placement of a nearby solar facility, and they were having difficulty getting in to till their land to prepare it for the growing season.

Grass and plant cover at solar facilities would prevent a lot of erosion, but water leaving the site carries some particulate, Heiniger said.

Frequent mowing to control vegetation can make soil more compact, and more resistant to absorbing water. Wider buffering around the site can offset much of that runoff. Putting in a subsoil also would help, but that can't be done until the solar panels are removed at the end of their useful life, and cost to do so would be an issue.

Heiniger said some solar installations were placed above lakes or ponds, which become infiltrated with runoff. If runoff occurs in sufficient volume, spillways of overwhelmed ponds could be threatened.

"*Right now we're just locating them next to the power substations,*" Heiniger said. He has been telling the solar industry scientific land use research is needed to determine best siting practices. "*We've at least got a dialogue started*."