

Do increased yields mean increased NO₃-N issues?

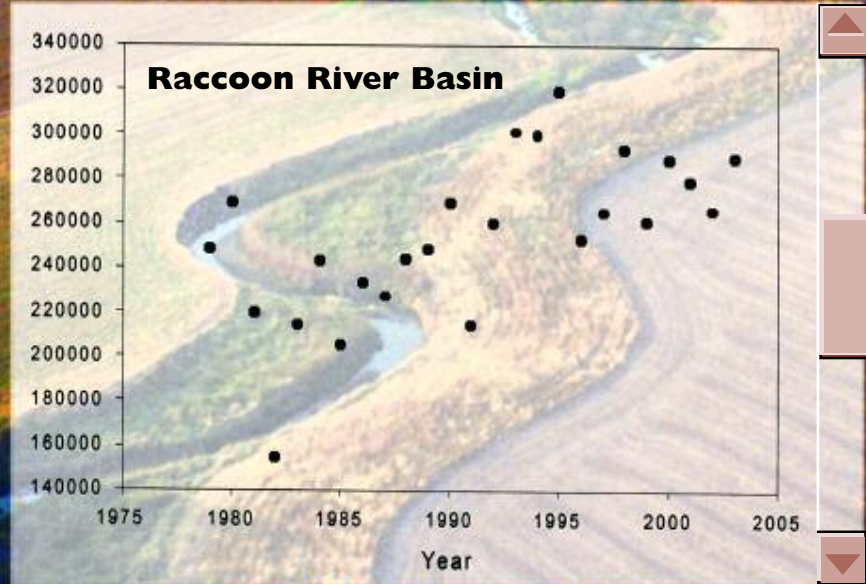
In the ongoing public discourse, an assumption persists that if we stopped applying fall anhydrous, then our water quality problems would go away. But since 1990, the total amount of fertilizer applied has been relatively flat —there's not more fertilizer going into the system, and researchers found a decrease in NO₃-N loading in the Raccoon River when compared to the amount of N applied within the watershed over the last 30 years. Cattle and hog numbers have decreased as well, so the manure pool has diminished, too (this doesn't apply in all Iowa watersheds, but is true of the Raccoon).

The change could be attributed to increased crop production, which has increased N removal from the soil profile. The annual rate of yield increase translates to an annual increase of over 1000 Mg of N removed by corn and 750 Mg from soybean production.

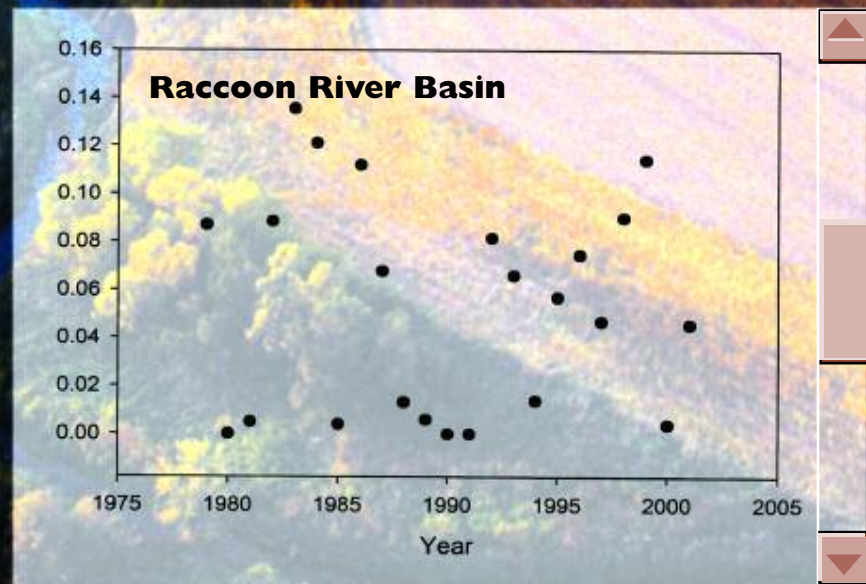
Also, there is relatively small amount of the N that is applied as fertilizer that is lost via transport down the Raccoon River. Agronomically-speaking, the most N lost is up to 17 pounds per acre — 10% or less of what is commonly applied. That is a relatively small amount of N to manage to achieve reductions in NO₃-N. In the end, it may not be reasonable to expect monumental change because we're dealing with a small fraction of N — under 10%. But even that small nitrogen loss is enough to cause high concentrations.

Development of ag management practices that affect water quality will have to be more inclusive than just changes in fertilizer rate and timing.

N Fertilizer Applied (mg)



N Fertilizer Load/N Applied



Nitrogen load lost from the Raccoon River relative to the amount of commercial fertilizer applied within the watershed.



The chart above shows Nitrogen fertilizer applied in the Raccoon River Basin from 1975 to 2005 in mg. There is little to no correlation between N application levels and nitrate levels in water.