

Nutrient Concentration and Distribution

The fundamental question, “Is my livestock or poultry operation concentrating nutrients?”, must be the premise for any successful nutrient management plan. Most nutrient-related issues associated with animal production result from poor nutrient distribution, leading to concentration-related problems. This distribution issue can be a local or a regional issue.

- *Single-field nutrient concentration issues.* An integrated crop and livestock farm commonly experiences this distribution problem within its own boundaries. Some fields, often those closest to the livestock facility, receive excessive manure applications while commercial fertilizer is purchased to meet the needs of fields more distant from the livestock. Spreading manure based upon convenience and not the crop’s nutrient requirements causes water quality problems.
- *Individual farm nutrient concentration issues.* Farms focused primarily on livestock production import significant quantities of nutrients as animal feeds. Livestock utilize only 10% to 30% of these nutrients, excreting the remaining as manure. This results in a concentration of nutrients on the livestock farm and a shortage of nutrients (typically replaced by purchased commercial fertilizers) on neighboring crop farms. The separation of ownership of crop and livestock production typically drives this problem. Such problems are commonly observed in regions where sufficient crop land is available but separation of livestock and crop ownership creates nutrient distribution problems (e.g., Corn Belt states).
- *Regional nutrient distribution issues* have developed in the last 30 years as livestock/poultry production and feed grain production has concentrated in specific, but separate, regions of the country (Figures 2-1 and 2-2). Examples of these regional nutrient distribution problems include the concentration of pork production in the Carolinas, poultry concentration in southern and mid-Atlantic states, beef cattle production in the High Plains, and dairy in western, north central, and northeastern states. Many of these regions import significant quantities of nutrients primarily as feed grains from the Corn Belt. The nutrients excreted by these animals can overwhelm the ability of locally grown crops to recycle these nutrients. These regional distribution problems (shaded areas in Figures 2-1 and -2) represent the animal feeding industry’s most difficult nutrient challenges.

To determine if these nutrient concentration concerns affect your livestock operation requires an appreciation of the total nutrient picture for your livestock operation. A discussion of a “Whole Farm Nutrient Balance” follows.

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For your operation, is nutrient concentration a

- Single-field issue?
- Individual farm issue?
- Regional issue?

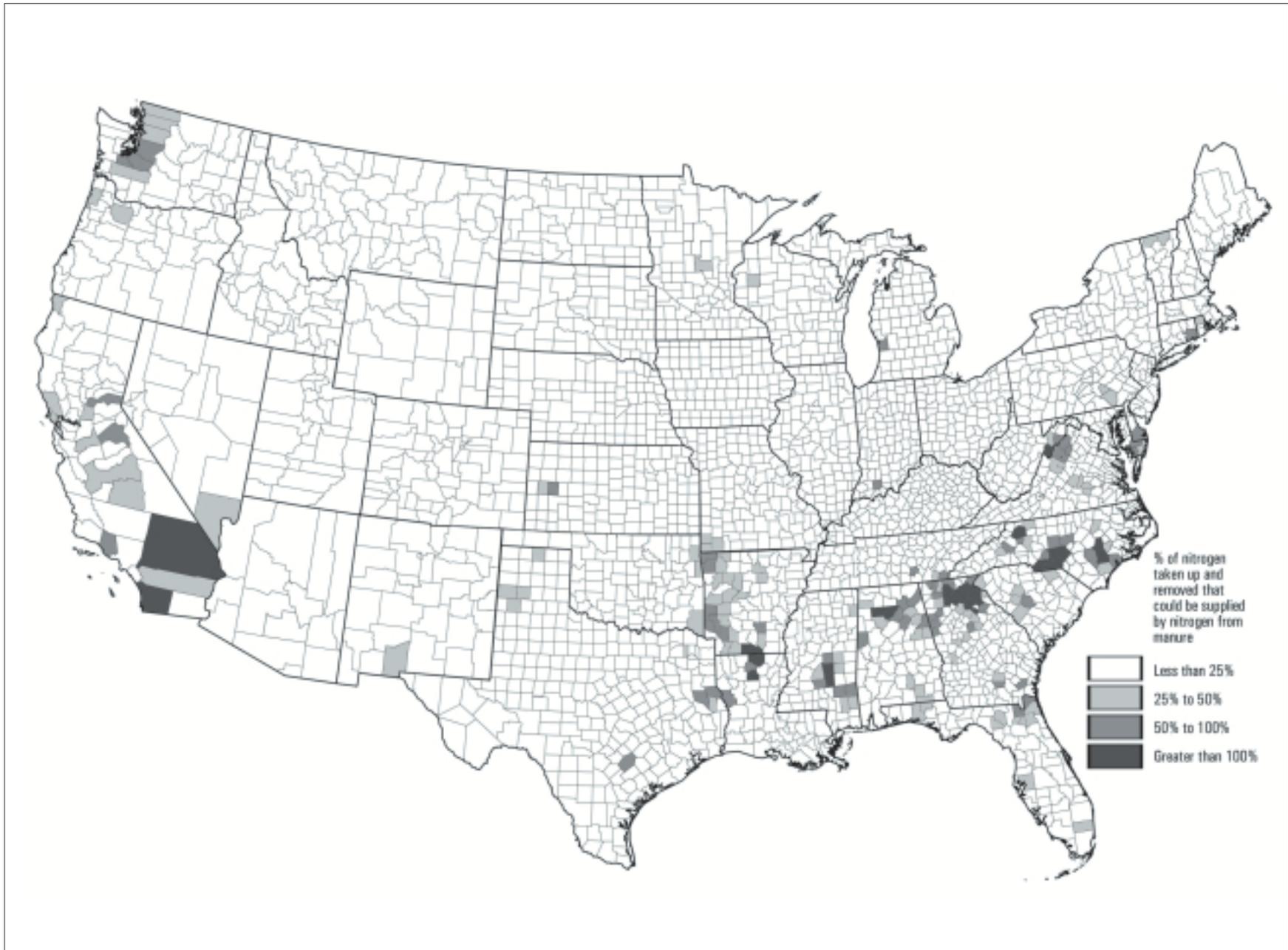


Figure 2-1. Potential for N available in animal manure to meet or exceed plant uptake and removal for harvested crop and hay land.

Source: Kellogg et al. 2000.

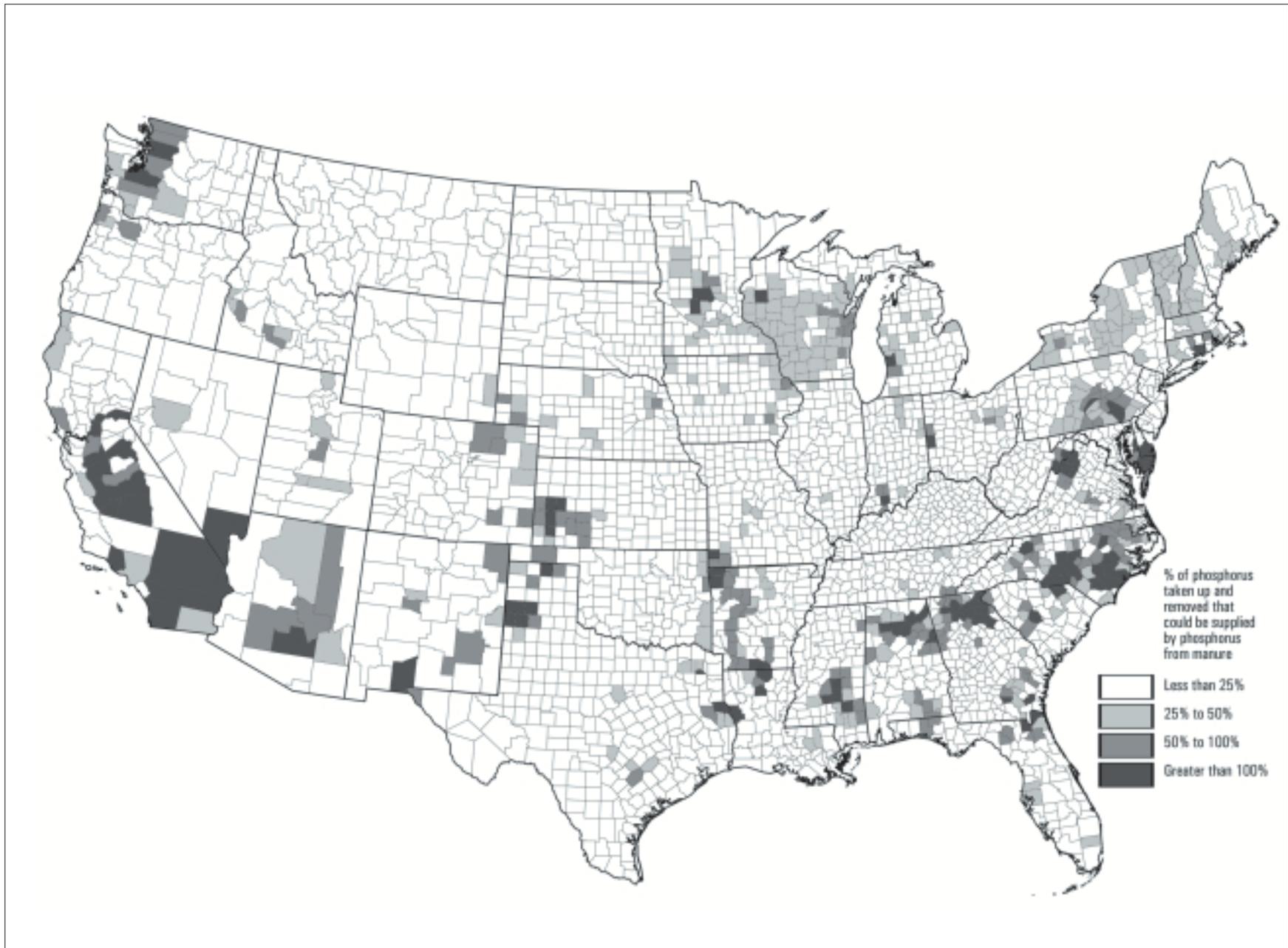


Figure 2-2. Potential for P available in animal manure to meet or exceed plant uptake and removal for harvested crop and hay land.

Source: Kellogg et al. 2000.