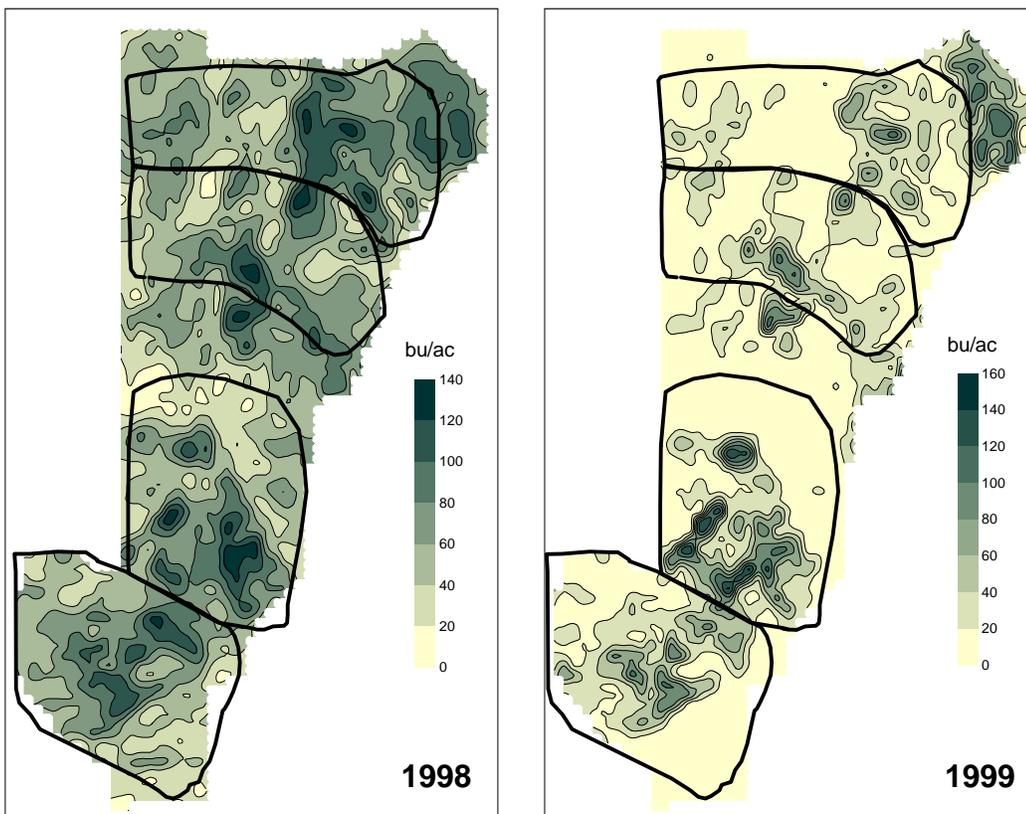


Comparison of Agricultural Production Systems

To meet the needs of a growing global population we must increase agricultural production. However, to effectively evaluate the impact of new farming strategies and recommendations on the environment, as well as their profitability, a broad perspective is needed to prevent simply shifting chemicals from one part of the hydrologic cycle to another. Agricultural chemicals leave farmland by a combination of several processes such as volatilization, surface runoff, and leaching. Because each of these processes may exhibit considerable spatial and temporal variability, models and algorithms developed must be process-based. Additionally, evaluation of agricultural impacts on the environment requires effective interaction between a number of disciplines.

On OPE3 vapor, surface runoff, and leaching fluxes are being evaluated on three small watersheds, each with a different agricultural practice. The watersheds have similar textures, slopes, subsurface stratigraphy and yield distributions. The agricultural practices being evaluated include: (1) conventional--uniform broadcast application of agricultural chemicals; (2) precision--site-specific application of agricultural chemicals; and (3) manure--uniform application of liquid manures.



This figure shows the spatial distribution of yields throughout the entire production site at OPE3. Darker colors denote higher corn grain yield. Not only are the textures and slope similar but each small watershed has similar yield patterns making direct comparisons more meaningful.

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