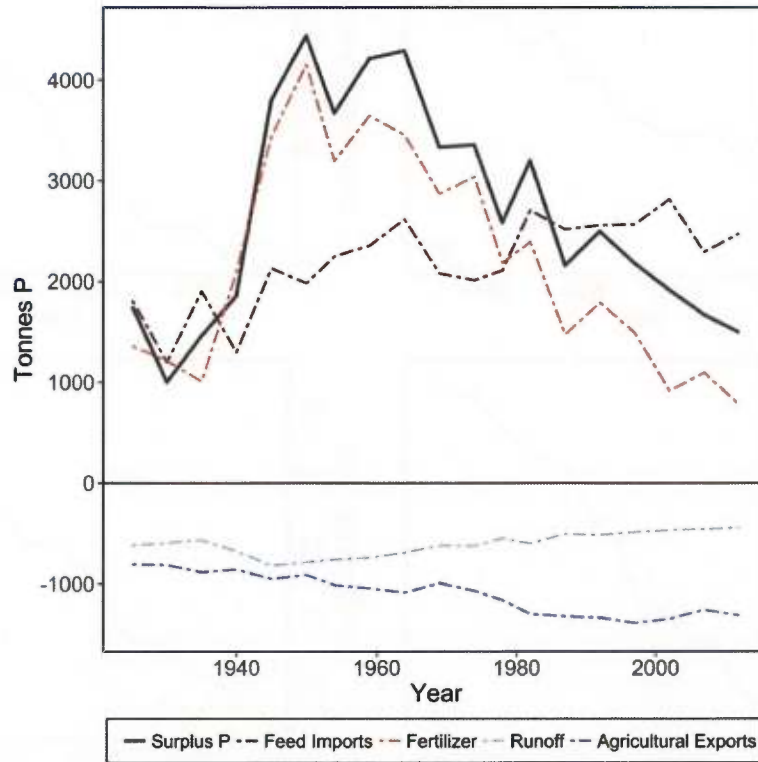


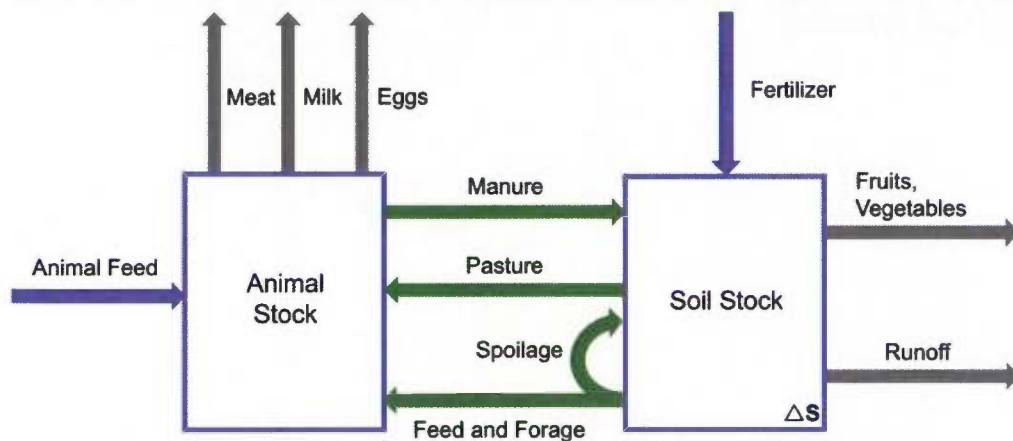
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# Michael Wironen

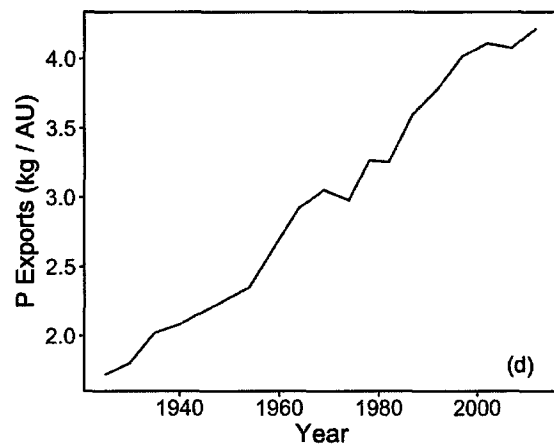
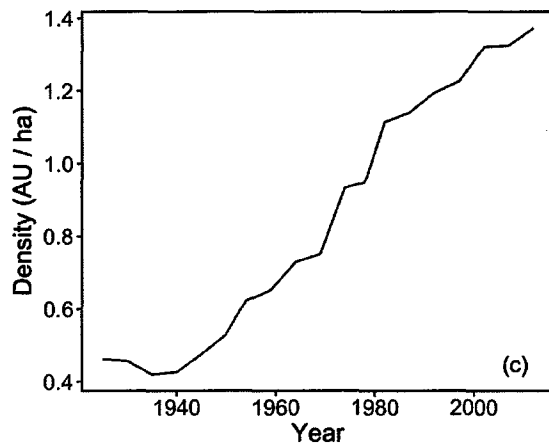
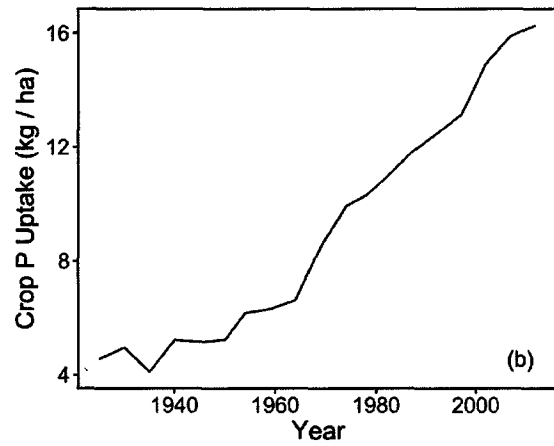
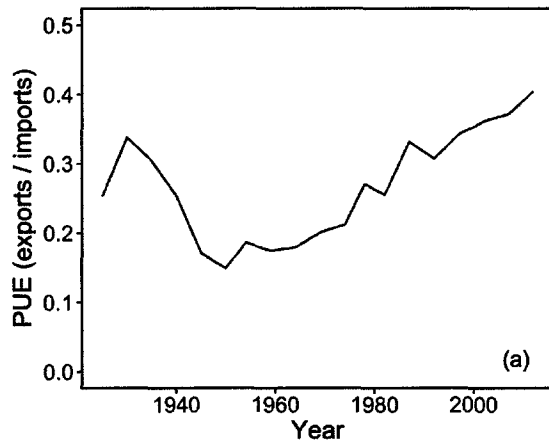
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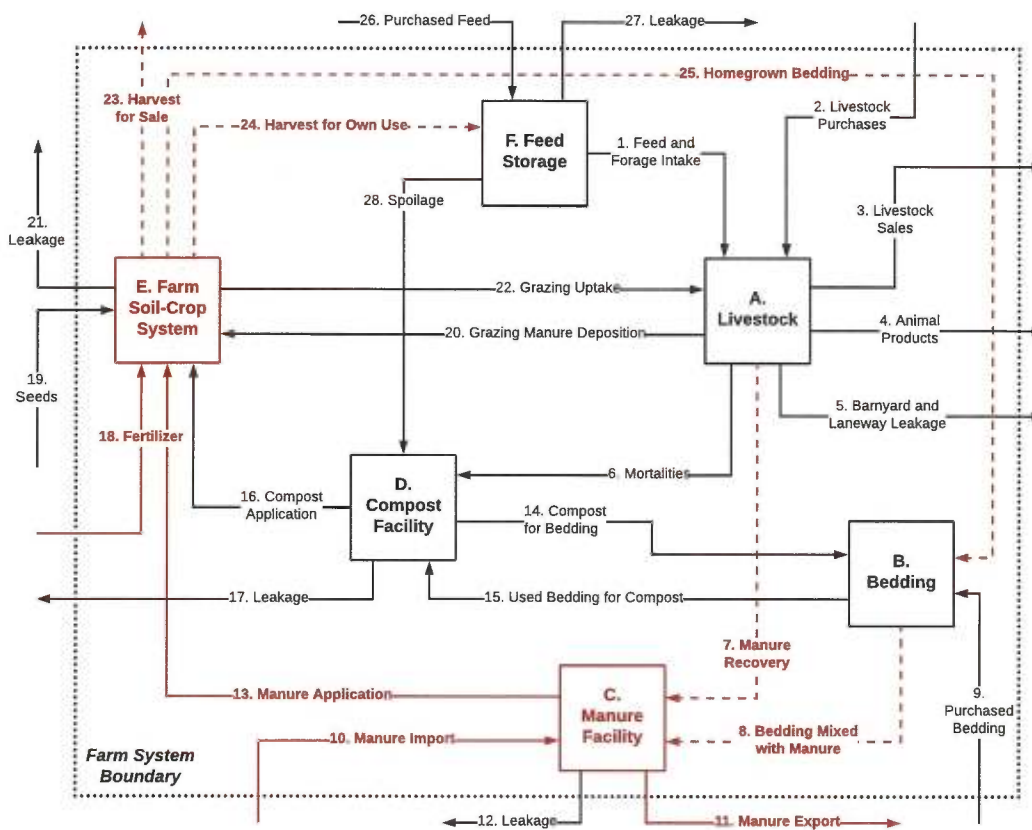
**Phosphorus flows and net balance in VT from 1925-2012.** Negative flows (values below zero) indicate outflows from VT's agricultural system.



**Phosphorus system diagram.** Inflows into VT's agricultural system are indicated by blue arrows, internal flows by green, and outflows by grey. The soil stock can change due to storage or depletion.



**Indicators of agricultural intensification and phosphorus use efficiency.** Phosphorus use efficiency (PUE) (a), crop P uptake rate (b), animal unit (AU) density (c), and P exports per AU (d) in VT from 1925-2012.



**Systems Diagram of Farm-Level P Stocks and Flows.** The stocks, or pools (boxes), and flows (lines with arrows) are typical of a semi-confinement dairy system. The area shaded in grey represents the farm system, with flows that cross the dashed border entering or leaving the farm system. The flows in solid red are directly captured in a 590 NMP. The flows in dashed red are captured, albeit grouped with other flows and so not directly quantified. Flows in black are not required in a 590 NMP. Leakage refers to fluxes of P into the environment, which includes runoff losses (as dissolved and particulate P) and fluxes into soil pools that are not cultivated (e.g. buffer strips, barnyard soils, adjacent forest, streambanks, etc.). Not all leakage ends up as a P discharge into a water body. Atmospheric transport and chemical weathering are ignored since they are largely out of the control of the farmer.