Alternatives to Open Burning in Ukraine
Best Options and Methods from Global Approaches

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Global Basics

- Burning decreases crop yields: damages organic matter, biota, soil structure, compacts and makes soil more “brittle”
- Does nothing to “enrich” the soil (instead burns off nutrients as smoke)
- Increases need for costly fertilizer (more and more over time)
- Increases soil erosion and run-off (including of those expensive fertilizers!) to pollute nearby water sources
- Decreases resilience to extreme events in changing climate: both to heavy rains, and drought as soils holds less moisture
- Loss of worker hours to burning supervision and injury
- Out of control fires cause damage to farm infrastructure and homes, as well as forest and pasture fires
Alternatives to Open Burning: Four Main Approaches

➢ Low-till agriculture

➢ No-till/direct seed approaches

➢ Full “Conservation Agriculture” adoption: including crop rotation, integrated manure management with livestock, cover crops, etc.

➢ Alternative use of stubble (bio-energy, bedding etc.)
I. Low-till Approaches

➢ Minimize plowing, incorporate stubble into soil to re-build humus and soil structure

➢ Most common no-burn approach in northern Europe/Scandinavia (where soils now have greater humus content than some frequently-burned, former “black earth” Ukrainian soils despite lower starting point)

➢ Easiest and “shortest” step for farmers: perhaps involves better plows, but no huge change in equipment: keeping stubble as soil enricher

➢ Still disturbs soil structure and some erosion (especially in heavy rains)
II. No-till Approaches

➢ Leaves previous crop in place, with seeding through stubble

➢ Requires a direct seeder (expensive) and often increased used of herbicides and fertilizer during first one-three years without much increase in yield

➢ Yields rise, and fertilizer need does decrease over time but herbicide application still needed

➢ Some farmer (and public) resistance as fields look “messy.” Most common approach in Argentina, Brazil, North American large farms as provides higher yields and profits after initial investment in equipment

➢ Provides greater resilience and resistance to erosion/run-off than low-till as old roots keep soil structure in place
III. Full Conservation Agriculture

➢ Incorporates no-till methods but a bigger change in entire approach to farming: not just direct seeding but use of cover crops, livestock manure injected (not spread) into soil, etc.)

➢ Still requires increased used of herbicides and fertilizer during first one-three years, but then a greater increase in yield and soil fertility

➢ Leads to “healthiest” soils and greatest resilience and climate benefits (including drawing down CO2 into soil)

➢ Seems to intimidate some farmers as too big a change from business-as-usual: seen as greater risk but often, destined to be main farming method of the future climate system
IV. Alternative Stubble Use

➢ Use of stubble as a resource for other purposes

➢ “Harvest” stubble for animal bedding or feed

➢ Energy production: straw harvested and fed directly into biogas cooker, often with other farm refuse; or manufactured into pellets to meet on-farm energy needs

➢ Requires a straw harvester and very expensive biogas conversion equipment

➢ Despite expense, is becoming more and more common in EU (Denmark, Germany)

➢ May contribute to greater energy independence for Ukraine and within Ukraine’s farming sector?
So, Which Method is Best?

- Often different “best” for different farming types, crops and environments

- Don’t let the “perfect” become the enemy of the “good/better” (CA may indeed be “best,” but intermediate steps also encouraged: main early step is to stop harmful burning!)

- “Let the farmer decide.” S/he knows soils, risk tolerance and economics of their land best!
Thank you!

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