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Göttingen - 3D Seminar

# General vs. Tailored Information for Technology Adoption

*Evidence from a Cluster Randomized Controlled Trial in India*

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# 2022 Farmer Field Survey, Haryana & Punjab

- Adoption rate of early sown wheat: 7-14%
- Adoption rate of zero tillage: 24%


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# Motivation for Field Experiment

- Idea: Facilitate adoption of ESW seeds and zero tillage by addressing farmers' information constraints.
  - **Intervention 1** *(general information)*: Group training, providing farmers with information about the general benefits and best practices of ESW and ZT.
  - **Intervention 2** *(tailored information)*: Extension support by agricultural expert, focusing on each farmer's individual household and plot characteristics.

- Theory (target input model):
  - Farmers face uncertainty about profitable usage practices of a technology but can process information to reduce uncertainty.
  - Decomposition of optimal usage choices into (a) systematic component and (b) idiosyncratic component:
    - Some technologies can be profitably applied based on *general information.*
    - Other technologies require individual-specific, *tailored information*.

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## Conjectures

- Profitable usage based on general information only ➔ Zero tillage (ZT)?
- Require tailored information ➔ ESW?

- Testable hypotheses
  1. Effectiveness of general vs. tailored information varies across technologies:
     - Providing general information increases adoption of ZT (but not ESW).
     - Increasing adoption of ESW requires additional tailored information.
  2. Information spillovers:
     - Positive for general information.
     - Small or insignificant for tailored information.

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# Cluster Randomized Controlled Trial (*JDE* Pre-results track)

- Timeline
  - Baseline survey: Feb/Mar 2024
  - Interventions: Jul 2024 - Mar 2025
  - Endline survey: Apr/May 2025 (post-harvest)

- Sample
  - 60 rural villages in Sonipat (Haryana), India
  - 1200 farmers (20 farmers per village)
  - Random assignment between/within villages

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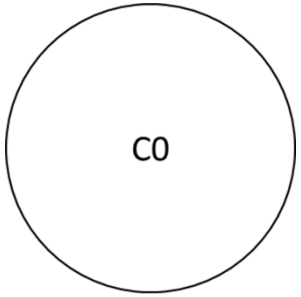
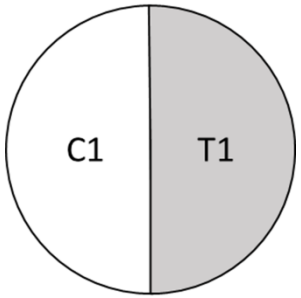
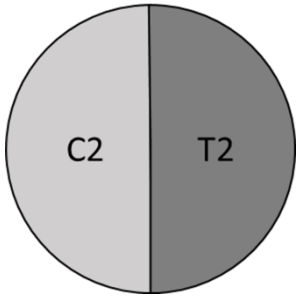
# RCT Design




- **20 control villages**
  - 20 farmers with no intervention (C0)



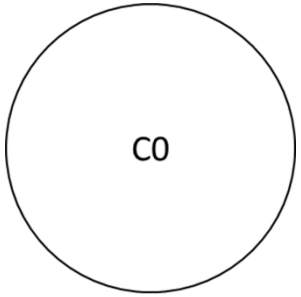

- **20 treatment(1) villages**
  - 10 farmers with no intervention (C1)
  - 10 farmers receive I1 (T1)

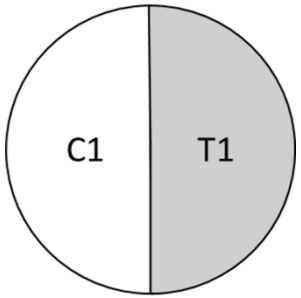


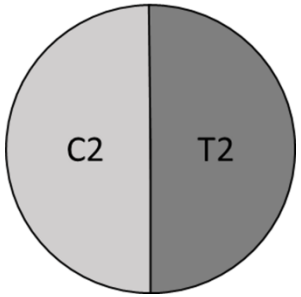

- **20 treatment(2) villages**
  - 10 farmers receive I1 (C2)
  - 10 farmers receive I1 and I2 (T2)

**I1**: General information; **I2**: Tailored information

# Testable Hypotheses




- General information is effective for ZT but not ESW
  - **H1**: T1 − C0 > 0 for ZT
  - **H2**: T1 − C0 = 0 for ESW
- General *and* tailored information is effective for ESW
  - **H3**: T2 − C0 > 0 for ESW
- Information spillovers for general information
  - **H4**: C1 − C0 > 0 for ZT (C1 − C0 = 0 for ESW)
- No spillovers for tailored information
  - **H5**: C2 − T1 = 0 for ESW (and ZT)

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# Related Literature and Contribution

- **Empirics**: Significant effects of information provision on (agric.) technology adoption
  - In-person (Hanna et al., 2014; BenYishay and Mobarak, 2019; Corral et al., 2020; Emerick and Dar, 2021; Kondylis et al., 2023)
  - ICT-based (Aker, 2011; Cole and Fernando, 2013; Casaburi et al., 2014; Fabregas et al., 2019)

  → First to compare impacts of general vs. tailored *in-person* advice (incl. spillovers).

- **Theory**: Information barriers to technology adoption
  - Foster and Rosenzweig (1995); Bandiera and Rasul (2006); Conley and Udry (2010); Hanna et al. (2014); Naeher (2022); Suri and Udry (2022)

  → Distinguish between different types of technologies (simple vs. complex).

  → Test alternative theories of learning and information processing.

- **Policy implications**
  - Program design: Different technologies require different types of information?
  - Efficiency: Cost of 'one-size-fits-all' group trainings vs. individual support.
  - Targeting: Incorporate information spillovers.
  - Peer farmers vs. extension staff?

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# Outlook

- Does promotion of zero tillage reduce crop residue burning?