Supplementary Material

This document contains supplementary material supporting the publication *Nichols and MacKenzie (2023) Identifying research priorities through decision analysis: a case study for cover crops*

# Supplementary Data

Supplementary data and R code is available on Github at <https://github.com/vanichols/Nichols_Frontiers_CoverCropRisk>

# Supplementary Figures and Tables

**Table S1**. Production costs and market prices per unit yield for 2013-2021, production costs come from Iowa State University (<https://www.extension.iastate.edu/agdm/crops/pdf/a1-20.pdf>), price received per bushel from NASS. Supporting material is available in the ‘SupplementaryMaterial>TableS1’ folder of the Github repository.

|  |  |  |  |
| --- | --- | --- | --- |
| **Source** | **Range in production costs** | **Ranch in market prices** | **Maximum net revenue** |
| Maize | $3.31 - 4.31 bu-1 | $3.30 - 5.45 bu-1 | $2.14 bu-1 (2021) |
| Soybean | $8.72 - 11.13 bu-1 | $8.46 - 13.1 bu-1 | $4.06 bu-1 (2021) |

**Table S2**. Assumed relative maize yields as functions of planting time and length of time between rye cover crop termination and crop planting (referred to as ‘gap’)

|  |  |  |  |
| --- | --- | --- | --- |
| Planting | 14+ days window yields | <14 days gap yields, 50% chance of a 10% maize yield reduction | Notes and assumptions |
| Early April | 100% | 100%/90% | April 11 is earliest planting date in compliance with crop insurance requirements. We assume producers aim to plant as soon as a field is workable after that date. We assumed a maximum yield of 200 bu ac-1. If maize is planted in the same spring category, there is a 50% chance there will be no ‘gap’ induced yield reduction and a 50% chance of a 10% yield reduction; this same assumption is applied to all planting dates. |
| Late April | 100% | 100%/90% | No yield penalty if maize is planted in late April. |
| Early May | 95% | 95%/85% | 5% yield penalty for planting in early May. |
| Late May | 90% | 90%/80% | 10% yield penalty for planting in late May. |
| June | 80% | 80%/70% | 20% yield penalty for planting in June. |

**Table S3**. Summary of fall weather uncertainties in Central Iowa estimated using 30 years of historical weather data

|  |  |  |
| --- | --- | --- |
| *Scenario* | *Probability of receiving 1.27 cm of precipitation before 30-Nov* | *Probability of accumulating 100 growing degree days (GDDs)* |
| Soybean-Rye  (15-Oct planting) | 97% | 100% |
| Maize-Rye  (1-Nov planting) | 84% | 71% |

## Supplementary Figures

**Chart

Description automatically generated**

**Supplementary Figure S1.** Decision tree following the decision of whether to terminate the cover crop in early or late April.