## Codebook

## Codebook for Secondary Data A Collection of Variables from Publicly Available and Free-to-access Sources

Dataset name:	secondary_data_blinded
Dataset size:	1 Mb
Column count:	48
Row count:	2,728
Updated date:	2025-06-04

## **Description:**

As a supplement to the data that we collected ourselves via the InBestSoil farm survey, we also extracted additional variables from publicly available sources to supplement the primary data. All data we present herewith has been reduced in granularity via a rounding procedure in order to protect the anonymity of the farmers who answered the survey as per our data protection agreement. For certain very large farms we set the maximum land area to 100 hectares to further protect the identity of these farmers as farms of such scale are rare in Switzerland.

The data can be linked to the full survey data set and the subset of data covering wheat production via the 'surveyid' variable. We include general farm structural information regarding cropped areas and the percentages of crop categories grown in rotation by a given farm. For the farms that grew milling wheat in the 2022/2023 production season we also include more detailed information relevant for wheat production aggregated across wheat plots including the average soil characteristics, geomorphology and meteorology. As all data presented within this document is secondary data that we did not collect ourselves we direct you to the original sources - which are outlined by variable below - for specific details. In using this data we also ask that you to respect and abide by the data usage regulations of the original sources.

For the variables extracted from geodienste.ch we would like to cite and thank the following cantonal administrations who have made the data publicly available via this webservice: Aargau (AG), Appenzell Ausserhoden (AR), Appenzell Innerrhoden (AI), Bern (BE), Basel-Landschaft (BL), Basel-Stadt (BS), Fribourg (FR), Genève (GE), Glarus (GL), Graubünden (GR), Jura (JU), Luzern (LU), Neuchâtel (NE), Nidwalden (NW), Obwalden (OW), St. Gallen (SG), Schaffhausen (SH), Solothurn (SO), Schwyz (SZ), Thurgau (TG), Ticino (TI), Uri (UR), Vaud (VD), Valais (VS), Zug (ZG) and Zürich (ZH). Please consult the included README file for the contact information for each cantonal geographic information system administration involved in providing the geodata via gieodienste.ch.

## **Column Attributes:**

1	Column name:	survey_id	
	Column description:	Individual survey ID	

Source information: InBestSoil farm survey

Column type: Character

Data type: Numeric

Unique non-missing value count: 2,728

Missing value count: 0

Mountain

Min	Mean	Median	Max	SD
42.00	1817.55	1804.50	3601.00	1017.08

2 Column nam	Column name: agricultural_zone_farm_site			
Column desc	ription:	Agricultural zone of farm [Factor	]	
Source information:		Extracted variable from the boundaries of agricultural zones in Switzerland map provided by the Federal Office for Agriculture (FOAG)		
Data type:		Factor		
Unique non-	missing value count:	3		
Missing valu	e count:	0		
Categories	Frequency	Cumulative Frequency	Percent	
Valley	2,160	2,160	79.18	
Hill	400	2,560	14.66	

2,728

168

6.16

3	Column name:		total_land_area	a		
	Column description: Source information:		Total land regis	Total land registered to farm [ha]		
			Extracted variable from the nutzungsflächen map (2023) provided by geodienste.ch			
	Data type:		Numeric			
	Unique non-missing value count:		19			
	Missing value count:		0			
N	Min	Mean	Median	Max	SD	
1	0.00	36.80	35.00	100.00	19.18	

4 Column name: total_arable_area	4	Column name:	total_arable_area	
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Column	Column description:		Total arable land registered to farm [ha]		
Source	Source information:		Extracted variable from the nutzungsflächen map (2023) provided by geodienste.ch		
Data typ	Data type:				
Unique	Unique non-missing value count:				
Missing	Missing value count:				
Min Mean		Median	Max	SD	
5.00	26.08	20.00	100.00	16.85	

5	Column name:		total_perm_grass_area		
	Column description:  Source information:  Data type:		Total permaner	nt grassland registered	d to farm [ha]
			Extracted variable from the nutzungsflächen map (2023) provided by geodienste.ch		
			Numeric		
	Unique non-missing value count:		14		
	Missing value count:		0		
	Min Mean		Median	Max	SD
	0.00	13.61	10.00	100.00	14.72

6	Column name:		perc_arable_b	eets	
	Column description:  Source information:		Share of arable	land producing beets	s [%]
			Calculated variable derived from information extracted from the nutzungsflächen map (2023) provided by geodienste.ch		
	Data type:		Numeric		
	Unique non-missing value count:		10		
	Missing value count:		0		
	Min Mean		Median	Max	SD
	0.00	4.61	0.00	50.00	7.63

7	Column name:	perc_arable_potatoes
	Column description:	Share of arable land producing potatoes [%]

from the nutzungsflächen map (2023) provided by

geodienste.ch

Data type: Numeric

Unique non-missing value count: 12

Source information:

Min	Mean	Median	Max	SD
0.00	2.52	0.00	65.00	6.41

8	Column name:		perc_arable_maize	;	
	Column description:  Source information:  Data type:  Unique non-missing value count:		Share of arable land	producing maize	[%]
			Calculated variable derived from information extracted from the nutzungsflächen map (2023) provided by geodienste.ch		
			Numeric		
			14		
	Missing value count:		0		
	Min Mean		Median	Max	SD
	0.00	15.02	15.00	75.00	11.39

9	Column n	ame:	perc_arable_temp_grass		
	Column description:  Source information:  Data type:		Share of arabl	e land under temporar	y grass [%]
			Calculated variable derived from information extracted from the nutzungsflächen map (2023) provided by geodienste.ch		
			Numeric		
	Unique no	n-missing value count:	21		
	Missing va	alue count:	0		
	Min	Mean	Median	Max	SD
	0.00	25.78	20.00	100.00	22.65

10	Column name:	perc_arable_bff
	Column description:	Share of arable land under biodiversity protection [%]

from the nutzungsflächen map (2023) provided by

geodienste.ch

Data type: Numeric

Unique non-missing value count: 7

Source information:

Min	Mean	Median	Max	SD
0.00	0.81	0.00	30.00	2.58

11	Column name	e:	perc_arable_barle	y		
	Column description:		Share of arable land	Share of arable land producing barley [%]		
	Source inform	ation:	Calculated variable derived from information extracted from the nutzungsflächen map (2023) provided by geodienste.ch			
	Data type:		Numeric			
	Unique non-m	issing value count:	11			
	Missing value count:		0			
	Min	Mean	Median	Max	SD	
	0.00	7.32	5.00	50.00	8.29	

12	Column name	<b>:</b>	perc_arable_wheat		
	Column description:		Share of arable lar	nd producing whe	at [%]
	Source information:  Data type:		Calculated variable derived from information extracted from the nutzungsflächen map (2023) provided by geodienste.ch		
			Numeric		
	Unique non-m	issing value count:	15		
	Missing value	count:	0		
	Min	Mean	Median	Max	SD
	0.00	22.11	20.00	80.00	11.52

13	Column name:	perc_arable_other_cereals
	Column description:	Share of arable land producing other cereals [%]

from the nutzungsflächen map (2023) provided by

geodienste.ch

Data type: Numeric

Unique non-missing value count: 14

Source information:

Min	Mean	Median	Max	SD
0.00	6.51	0.00	80.00	9.57

14	Column name	e:	perc_arable_osr			
	Column description:		Share of arable land	Share of arable land producing oilseed rape [%]		
	Source informa	ation:	Calculated variable derived from information extracted from the nutzungsflächen map (2023) provided by geodienste.ch			
	Data type:		Numeric			
	Unique non-m	issing value count:	11			
	Missing value	count:	0			
	Min	Mean	Median	Max	SD	
	0.00	7.14	0.00	60.00	8.61	

15	Column name	e:	perc_arable_other_oilseeds			
	Column description:  Source information:  Data type:		Share of arable l	Share of arable land producing other oilseeds [%]		
			Calculated variable derived from information extracted from the nutzungsflächen map (2023) provided by geodienste.ch			
			Numeric			
	Unique non-m	issing value count:	8			
	Missing value	count:	0			
	Min	Mean	Median	Max	SD	
	0.00	1.96	0.00	35.00	4.71	

16	Column name:	perc_arable_legumes
	Column description:	Share of arable land producing legumes [%]

from the nutzungsflächen map (2023) provided by

geodienste.ch

Data type: Numeric

Unique non-missing value count: 10

Source information:

Missing value count: 0

Min	Mean	Median	Max	SD
0.00	2.23	0.00	65.00	5.42

17	Column name	:	perc_arable_veg_fruits		
	Column description:		Share of arable land	l producing field	veg/berries [%]
	Source informa	ation:	Calculated variable derived from information extracted from the nutzungsflächen map (2023) provided by geodienste.ch		
	Data type:		Numeric		
	Unique non-mi	issing value count:	16		
	Missing value	count:	0		
	Min	Mean	Median	Max	SD
	0.00	2.05	0.00	90.00	7.09

18	Column nam	ie:	number_wheat_plots_total			
	Column description:  Source information:  Data type:		Number of milling wheat plots registered to farm [No.]  Extracted variable from the nutzungsflächen map (2023) provided by geodienste.ch			
			Integer			
	Unique non-r	nissing value count:	27			
	Missing value	e count:	474			
	Min	Mean	Median	Max	SD	
	1.00	3.54	3.00	100.00	3.72	

19	Column name:	total_wheat_area

Column description: Total milling wheat land registered to farm [ha]

Extracted variable from the nutzungsflächen map (2023) provided by geodienste.ch Source information:

Data type: Numeric

Unique non-missing value count: 30

Min	Mean	Median	Max	SD
1.00	6.17	5.00	30.00	4.96

20	Column name	e:	avreage_clay_content_wheat		
	Column description:  Source information:		Average soil clay content - milling wheat fields - 5- 15cm depth [%]  Extracted variable from the soilgrids provided by the International Soil Reference and Information Centre (ISRIC)		
	Data type:		Numeric 9		
	Unique non-m	issing value count:			
	Missing value count:		474		
	Min	Mean	Median	Max	SD
	10.00	24.57	25.00	50.00	6.01

21	Column name	2:	avreage_sand_con	tent_wheat	
	Column description:  Source information:		Average soil sand content - milling wheat fields - 5- 15cm depth [%]  Extracted variable from the soilgrids provided by the International Soil Reference and Information Centre (ISRIC)		
	Data type:		Numeric 12		
	Unique non-m	issing value count:			
	Missing value	count:	474		
	Min	Mean	Median	Max	SD
	10.00	39.84	40.00	65.00	9.66

22	Column name:	avreage_silt_content_wheat

Column	Column description:  Source information:  Data type:		Average soil silt content - milling wheat fields - 5-15cm depth [%]  Extracted variable from the soilgrids provided by the International Soil Reference and Information Centre (ISRIC)  Numeric		
Source i					
Data typ					
Unique	non-missing value count:	9			
Missing	value count:	474			
Min	Mean	Median	Max	SD	
20.00	35.62	35.00	60.00	5.12	

23	Column nan	ne:	average_altitu	ıde_wheat	
	Column description:  Source information:		Average altitude - milling wheat fields [metre a.s.l.]  Extracted variable from the digital height model DHM25 provided by the Federal Office of Topography (swisstopo)		
	Data type:		Numeric 18		
	Unique non-	missing value count:			
	Missing valu	e count:	474		
	Min	Mean	Median	Max	SD
	250.00	540.42	500.00	1100.00	115.24

24	Column name	:	average_slope_angle_wheat			
	Column description:  Source information:  Data type:		Average slope angle - milling wheat fields [%]			
			Calculated variable derived from information extracted from the digital height model DHM25 provided by the Federal Office of Topography (swisstopo)			
			Numeric			
	Unique non-mi	ssing value count:	17			
	Missing value count:		474			
-	Min	Mean	Median	Max	SD	
	0.00	3.77	3.00	19.00	2.59	

25	Column	name:	average_temp	_2022_09	
	Column	description:	Average temperature - milling wheat fields - September 2022 [°C]  Extracted variable from the gridded monthly average temperature data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)		
	Source in	nformation:			
	Data type	e:	Numeric		
	Unique n	non-missing value count:	7		
	Missing	value count:	477		
	Min	Mean	Median	Max	SD
	10.00	14.05	14.00	16.00	0.72
26	Column name:		average_temp_2022_10		
	Column description:  Source information:		Average temperature - milling wheat fields - October 2022 [°C]		
			2022 [°C]		
	Source in		Extracted varia temperature date	ble from the gridded ta provided by the Fe nd Climatology (Met	ederal Office of
	Source in	nformation:	Extracted varia temperature date	ta provided by the Fe	ederal Office of
	Data type	nformation:	Extracted varia temperature dat Meteorology ar	ta provided by the Fe	ederal Office of
	Data type Unique n	nformation: e:	Extracted varia temperature dat Meteorology an Numeric	ta provided by the Fe	ederal Office of
	Data type Unique n	nformation: e: non-missing value count:	Extracted varia temperature day Meteorology an Numeric	ta provided by the Fe	ederal Office of
	Data type Unique n Missing	nformation: e: non-missing value count: value count:	Extracted varia temperature dat Meteorology an Numeric 5	ta provided by the Fend Climatology (Met	ederal Office of eoSwiss)
27	Data type Unique n Missing	nformation: e: non-missing value count: value count:  Mean 13.41	Extracted varia temperature dat Meteorology an Numeric 5 477 Median	Max 15.00	ederal Office of eoSwiss)
27	Data type Unique n Missing v Min 11.00 Column	nformation: e: non-missing value count: value count:  Mean 13.41	Extracted variatemperature data Meteorology and Numeric 5 477 Median 13.00 average_temp.	Max 15.00	sD 0.63

Numeric

6

477

Median

Max

SD

Data type:

Min

Unique non-missing value count:

Mean

4.00	6.99	7.00	9.00	0.65

28 Co	lumn name:	average_temp_202	22_12	
Со	lumn description:	Average temperature - milling wheat fields - December 2022 [°C]		
Source information: Extracted variable from the gridded temperature data provided by the Fe Meteorology and Climatology (Met			ederal Office of	
Da	ta type:	Numeric 5		
Un	ique non-missing value count:			
Mi	ssing value count:	477		
Min	Mean	Median	Max	SD
1.00	2.78	3.00	5.00	0.77

29	Column nam	e:	average_temp_2	023_01	
	Column description:  Source information:		Average temperate 2023 [°C]	ture - milling whea	nt fields - January
			Extracted variable from the gridded monthly average temperature data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)		
	Data type:		Numeric		
	Unique non-m	nissing value count:	7		
	Missing value count:		477		
	Min	Mean	Median	Max	SD
	-1.00	2.47	3.00	5.00	0.81

30	Column name:	average_temp_2023_02	
	Column description:	Average temperature - milling wheat fields - February 2023 [°C]	
	Source information:	Extracted variable from the gridded monthly average temperature data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)	
	Data type:	Numeric	
	Unique non-missing value count:	6	
	Missing value count:	477	

Min	Mean	Median	Max	SD
-1.00	3.14	3.00	5.00	0.56

31	Column name	<b>:</b>	average_temp	_2023_03	
	Column description:  Source information:		Average temper 2023 [°C]	rature - milling whea	at fields - March
			Extracted variable from the gridded monthly average temperature data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)		
	Data type:		Numeric		
	Unique non-m	issing value count:	7		
	Missing value	count:	477		
	Min	Mean	Median	Max	SD
	3.00	6.84	7.00	9.00	0.67

32	Column name	e:	average_temp_2023	3_04	
	Column description:  Source information:		Average temperature [°C]	e - milling wheat field	ds - April 2023
			Extracted variable from the gridded monthly average temperature data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)		
	Data type:		Numeric 7		
	Unique non-m	issing value count:			
	Missing value	count:	477		
	Min	Mean	Median	Max	SD
	4.00	8.14	8.00	10.00	0.76

33	Column name:	average_temp_2023_05	
	Column description:	Average temperature - milling wheat fields - May 2023 [°C]	
	Source information:	Extracted variable from the gridded monthly average temperature data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)	
	Data type:	Numeric	

Unique non-missing value count: 7

Min	Mean	Median	Max	SD
10.00	13.87	14.00	16.00	0.80

34	Column name	:	average_temp_202	3_06	
	Column description:  Source information:  Data type:		Average temperatur [°C]	e - milling whea	at fields - June 2023
			Extracted variable from the gridded monthly average temperature data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)		
			Numeric		
	Unique non-mi	ssing value count:	6		
	Missing value	count:	477		
	Min Mean		Median	Max	SD
	15.00	19.70	20.00	21.00	0.74

35	Column name	2:	average_temp_	_2023_07	
	Column descri	ption:	Average temperature - milling wheat fields - July 202 [°C]  Extracted variable from the gridded monthly average temperature data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)		t fields - July 2023
	Source inform	ation:			deral Office of
	Data type:		Numeric		
	Unique non-m	issing value count:	8		
	Missing value count:		477		
	Min Mean		Median	Max	SD
	16.00	20.17	20.00	23.00	0.76

36	Column name:	average_temp_2023_08		
	Column description:	Average temperature - milling wheat fields - August 2023 [°C]		

Extracted variable from the gridded monthly average temperature data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss) Source information:

Data type: Numeric

Unique non-missing value count: 7

Min	Mean	Median	Max	SD
16.00	19.87	20.00	22.00	0.76

37	Column name	e:	total_prec_2022_09			
	Column description:		Total precipitation 2022 [mm]	Total precipitation - milling wheat fields - September 2022 [mm]		
	Source inform	ation:	Extracted variable from the gridded monthly average precipitation data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)			
	Data type:		Numeric			
	Unique non-m	issing value count:	24			
	Missing value	count:	477			
	Min Mean		Median	Max	SD	
	40.00	161.58	160.00	280.00	36.04	

38	Column name:		total_prec_2022_10			
	Column description:  Source information:  Data type:		Total precipitation - milling wheat fields - October 2022 [mm]			
			Extracted variable from the gridded monthly average precipitation data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)			
			Numeric			
	Unique non-m	issing value count:	11			
	Missing value	count:	477			
	Min Mean		Median	Max	SD	
	40.00	78.06	80.00	140.00	12.95	

39	Column name:	total_prec_2022_11	
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	Column descri	iption:	Total precipitation - milling wheat fields - November 2022 [mm]			
	Source information:  Data type: Unique non-missing value count: Missing value count:		Extracted variable from the gridded monthly average precipitation data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)  Numeric			
			12 477			
	Min	Mean	Median	Max	SD	
	30.00	77.78	80.00	140.00	15.15	
40	40 Column name:		total_prec_20	22_12		
	Column description:  Source information:		Total precipitation - milling wheat fields - December 2022 [mm]			
			Extracted variable from the gridded monthly average precipitation data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)			
Data type:			Numeric			

Column d	escription:	Total precipitation - milling wheat fields - December 2022 [mm]			
Source inf	Formation:	Extracted variable from the gridded monthly average precipitation data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)			
Data type:	Data type: Unique non-missing value count: Missing value count:		Numeric 13		
Unique no					
Missing v					
Min Mean		Median	Max	SD	
40.00	96.22	100.00	160.00	19.83	

41	Column name:		total_prec_2023_01		
	Column description:  Source information:  Data type: Unique non-missing value count: Missing value count:		Total precipitation - milling wheat fields - January 2023 [mm]  Extracted variable from the gridded monthly average precipitation data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)  Numeric  11		
			477		
	Min Mean		Median	Max	SD
	20.00	62.15	60.00	120.00	16.36

42	Column	name:	total_prec_2023_02			
	Column description:  Source information:		Total precipitation - milling wheat fields - February 2023 [mm]  Extracted variable from the gridded monthly average precipitation data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)			
	Data type	:	Numeric			
	Unique no	on-missing value count:	8			
	Missing v	ralue count:	477			
	Min	Mean	Median	Max	SD	
	0.00	11.34	10.00	70.00	8.38	
43	Column 1	name:	total_prec_2023_03			
	Column description:  Source information:		Total precipitation - milling wheat fields - March 2023 [mm]			
			Extracted variable from the gridded monthly average precipitation data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)			
	Data type	:	Numeric			
	Unique no	on-missing value count:	12			
	Missing v	ralue count:	477			
	Min	Mean	Median	Max	SD	
	60.00	99.94	100.00	180.00	17.17	
44	Column name:		total_prec_20	23_04		
	Column d	escription:	Total precipitation - milling wheat fields - April 2023 [mm]			
	Source information:		Extracted variable from the gridded monthly average precipitation data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)			
	Data type	:	Numeric			
	Unique no	on-missing value count:	16			
	Missing v	value count:	477			
	Min	Mean	Median	Max	SD	

	50.00	93.25	90.00	220.00	21.48	
45	Column	name:	total_prec_202	23_05		
	Column	description:	Total precipitation - milling wheat fields - May 2023 [mm]  Extracted variable from the gridded monthly average precipitation data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)			
	Source in	nformation:				
	Data type	e:	Numeric			
	Unique n	on-missing value count:	19			
	Missing	value count:	477			
	Min	Mean	Median	Max	SD	
	20.00	75.23	70.00	200.00	27.76	
46	Column	name:	total_prec_2023_06			
	Column description:		Total precipitation - milling wheat fields - June 2023 [mm]			
	Source in	nformation:	Extracted variable from the gridded monthly average precipitation data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)  Numeric			
	Data type					
		2:	Numeric			
	Unique n	e: on-missing value count:	Numeric 7			
	-		_			
	-	on-missing value count:	7	Max	SD	
	Missing	on-missing value count:	7 477	Max 80.00	SD 10.20	
47	Missing v	on-missing value count:  value count:  Mean  41.18	7 477 Median	80.00		
47	Minssing v Min 20.00 Column	on-missing value count:  value count:  Mean  41.18	7 477 Median 40.00 total_prec_202	80.00	10.20	
47	Missing v Min 20.00  Column Column	on-missing value count:  value count:  Mean  41.18  name:	7 477 Median 40.00  total_prec_202  Total precipitat [mm]  Extracted variat precipitation dates	80.00 <b>23_07</b>	10.20  delds - July 2023  monthly average ederal Office of	
47	Missing v Min 20.00  Column Column	mame:  description:	7 477 Median 40.00  total_prec_202  Total precipitat [mm]  Extracted variat precipitation dates	80.00  23_07  tion - milling wheat finds the gridded at a provided by the Fe	10.20  delds - July 2023  monthly average ederal Office of	
47	Missing v  Min  20.00  Column  Column  Source in	mame:  description:	7 477 Median 40.00  total_prec_202  Total precipitat [mm]  Extracted variat precipitation da Meteorology and	80.00  23_07  tion - milling wheat finds the gridded at a provided by the Fe	10.20  delds - July 2023  monthly average ederal Office of	

Min	Mean	Median	Max	SD
30.00	104.70	110.00	230.00	34.13

48	Column nam	e:	total_prec_2023_08			
	Column description:  Source information:  Data type:		Total precipita [mm]	ation - milling wheat f	ields - August 2023	
			Extracted variable from the gridded monthly average precipitation data provided by the Federal Office of Meteorology and Climatology (MeteoSwiss)			
			Numeric			
	Unique non-m	issing value count:	24			
	Missing value count:		477			
	Min Mean		Median	Max	SD	
	60.00	106.33	100.00	310.00	33.18	