

GIES Case Dataset on Yucheng Wheat-grain Double Cropping Yellow River Irrigation Farmland in Fangsi Town, Shandong Province of China

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Abstract: Yucheng city is located in the alluvial plain of Yellow River in the northwest of Shandong province with a long history in agriculture and is the place where legendary Da Yu tamed the floods. Yucheng is also of the pilot zone for the showcase of saline-alkali soil improvement by the Chinese Academy of Sciences. The case area of Fangsi Town, Yucheng, is located at 37°N, which is moist but not wet in summer and dry but not parch in winter. The unique natural conditions and advanced cultivation make the case area an ideal place for quality special wheat and high starch maize. Wheat-maize double cropping is the characteristic agricultural mode of Yucheng Fangsi. This study collected the data of physical geography, crop varieties, management, and agricultural history of the case area, analyzed the geographical genes of agricultural products, and explored the relationship between environmental protection and sustainable development, so as to provide informed support for the effective link between the ecology and Rural Revitalization in Yucheng. The dataset includes: (1) GIS boundary data of Fangsi town and Yucheng city; (2) physical geographical data, including climate, soil, water and NDVI; (3) quality data of wheat and maize; (4) cultivation data of wheat and maize; (5) standard and quality of wheat processed products; (6) management data of processed wheat products; (7) in situ photos. The dataset is archived in .shp, .xls, .jpg, .pdf and .docx formats with a size of 48.1 MB (45.9 MB in compression).

Keywords: Yucheng; Fangsi town; Yellow River irrigation area; wheat-maize double cropping; GIES Case 9

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CSTR: <https://cstr.science.org.cn/CSTR:20146.14.2021.04.05>

Dataset Availability Statement:

The dataset supporting this paper was published and is accessible through the *Digital Journal of Global Change Data Repository* at: <https://doi.org/10.3974/geodb.2021.12.44.V1> or <https://cstr.science.org.cn/CSTR:20146.11.2021.12.44.V1>.

1 Introduction

Yucheng city is located in the alluvial plain of the Yellow River in the northwest of Shandong province. Yucheng got its name from Dayu. According to legend, Dayu was one of the earliest tribal leaders of the Chinese people and tamed the flood in today's Yucheng. It is also an area for Chinese scientists to demonstrate their evolving technologies to treat poor soils on a large scale. Since the 1950s, the Chinese Academy of Sciences and the Chinese Academy of Agricultural Sciences have developed high-standard farmland in the entire area of Yucheng through sand and alkali control, agricultural development, and water-saving irrigation. Fangsi town of Yucheng is located at the golden zone nearby 37°N. It is moist but not wet in summer and dry but not parch in winter. Therefore, it has superior conditions for twice cropping of winter wheat and summer maize. Double cropping of wheat and grain is the typical cropping mode of Fangsi in Yucheng. This study comparatively analyzes the multiple datasets of physical geography, crop varieties, cultivation management, and history of the Yucheng wheat-grain double-ripening Fangsi irrigation area, and explores the collaborative relationship between environmental protection and sustainable development in the case area, aiming to provide a feasible case for the compelling connection between ecological civilization construction and rural revitalization in Yucheng.

2 Metadata of the Dataset

The metadata of the Wheat-maize double cropping field in Yellow River Irrigation Fangsi Town case dataset on environment protection and sustainable development^[1] is summarized in Table 1. It includes the dataset full name, short name, authors, year of the dataset, temporal resolution, spatial resolution, data format, data size, data files, data publisher, and data sharing policy, etc.

3 Geographical Scope of the Case Area

The case study area is located at Fangsi town. Fangsi is a town under the jurisdiction of Yucheng, Dezhou city (prefecture), Shandong province, with an area of 146.24 km². Fangsi town has 11 communities and 123 administrative villages. The geographical scope is the farmland of wheat-maize in Fangsi town, with a total area of 63.96 km² (Figure 1, 2).

4 Ecological and Geographical Environment

The case area is located in the alluvial plain in the middle and lower reaches of the Yellow River, which is classified as the warm temperate semi-humid monsoon climate area and is a typical alluvial plain. The parent material for soil formation is Yellow River alluvial and sediment. The soil surface texture is mostly medium loam, and the soil layer is deep and easy to cultivate^[3]. Soil pH is generally neutral or slightly alkaline and rich in nutrients, such as nitrogen, phosphorus, and potassium. The case area is a yellow-diversion irrigation area located in the second largest irrigation sector in the lower reaches of the Yellow River.

Table 1 Metadata summary of Wheat-maize double cropping field in Yellow River Irrigation Fangsi Town case dataset on environment protection and sustainable development^[1]

Items	Description
Dataset full name	Wheat-maize double cropping field in Yellow River Irrigation Fangsi Town case dataset on environment protection and sustainable development
Dataset short name	YuchengWheatMaizeCase09
Authors	Wang, Z. B., Institute of Geographic Sciences and Natural Resources Research (IGSNRR), Chinese Academy of Sciences (CAS), wangzb@igsnr.ac.cn Li, K. X., IGSNRR, CAS, likx@igsnr.ac.cn Huang, Y. H., IGSNRR, CAS Lyu, J. L., Institute of Wheat Research, Dezhou Academy of Agricultural Sciences Zhou, L., Yucheng Municipal Government Chen, X., Yucheng Municipal Bureau of Agricultural and Rural Affairs Li, T., Yucheng Municipal Bureau of Agricultural and Rural Affairs Wen, D. H., Fangsi town local government, Yucheng Ni, W. T., Fangsi town local government, Yucheng Shao, Y., Yucheng Maixiangyuan Food Co., Ltd. Zhu, X. G., Beijing Tianhang Create Technology Co., Ltd. Liu, J., Yucheng Municipal Bureau of Agricultural and Rural Affairs Shao, J., Yucheng Municipal Bureau of Agricultural and Rural Affairs Chen, L. J., Yucheng Municipal Bureau of Agricultural and Rural Affairs
Geographical area	Fangsi, Yucheng city, Shandong province
Year	1991–2021
Data format	.shp, .pdf, .xls, .docx, .jpg
Data size	48.1 MB
Data files	Case range, physical geography, variety characteristics, operational management
Foundation	Chinese Academy of Science Institution-Local Cooperation Project
Data publisher	Global Change Research Data Publishing & Repository, http://www.geodoi.ac.cn
Address	No. 11A, Datun Road, Chaoyang District, Beijing 100101, China
Data sharing policy	Data from the Global Change Research Data Publishing & Repository includes metadata, datasets (in the <i>Digital Journal of Global Change Data Repository</i>), and publications (in the <i>Journal of Global Change Data & Discovery</i>). Data sharing policy includes: (1) Data are openly available and can be free downloaded via the Internet; (2) End users are encouraged to use Data subject to citation; (3) Users, who are by definition also value-added service providers, are welcome to redistribute Data subject to written permission from the GCdataPR Editorial Office and the issuance of a Data redistribution license; and (4) If Data are used to compile new datasets, the ‘ten per cent principal’ should be followed such that Data records utilized should not surpass 10% of the new dataset contents, while sources should be clearly noted in suitable places in the new dataset ^[2]
Communication and searchable system	DOI, CSTR, Crossref, DCI, CSCD, CNKI, SciEngine, WDS/ISC, GEOSS

4.1 Climatic Conditions

Yucheng is in a warm-temperate semi-humid continental monsoon climate zone, where there is plenty of heat and light, as well as simultaneous rain and heat, which makes it ideal for agriculture. The average temperature in this region is 13.1 °C, and the average precipitation is about 567 mm (1,144.4 mm in wet years and 238 mm in dry years).

Precipitation shows a clear seasonal pattern with most precipitation occurring in summer (65 % of the total per year), and less in the winter and spring (20 % of the total per year)^[4]. According to Fangsi town’s meteorological data for the past 30 years (provided by Yucheng Meteorological Bureau), monthly meteorological data for the past 30 years in the case area are shown in Figure 3–6. During the wheat flowering and maturity period (April to June), the average temperature in the case area over the past 30 years is 20.36 °C, and the average daily temperature range is from 11.3 to 11.6 °C. It is beneficial for wheat grains to improving the protein content as well as to extending dough stability times^[4], which are favorable for the production of high-quality wheat.

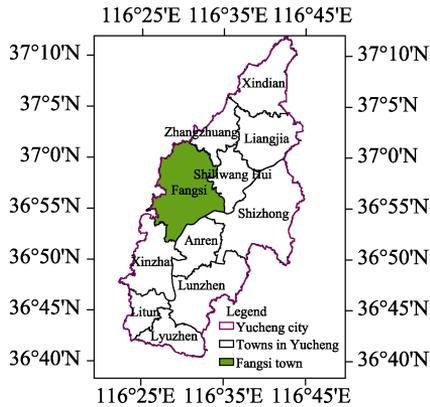


Figure 1 Geographical location of Fangsi town

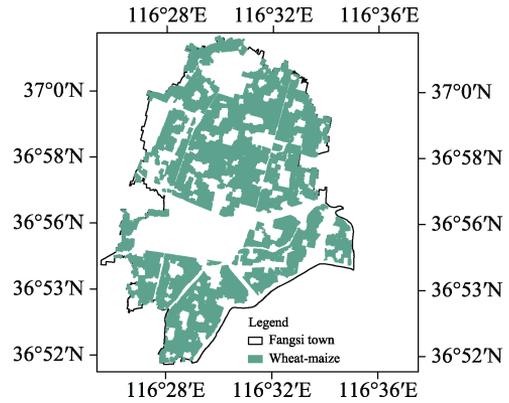


Figure 2 Wheat-maize region in Fangsi town

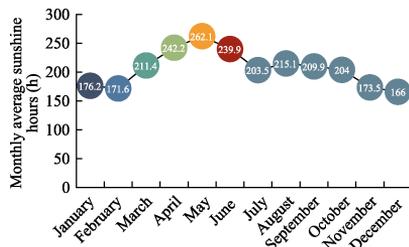


Figure 3 Monthly average sunshine hours

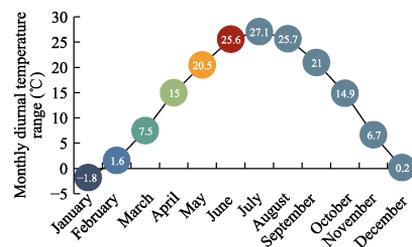


Figure 4 Monthly average temperature

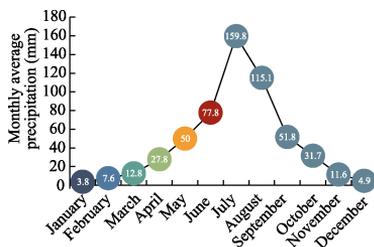


Figure 5 Monthly precipitation

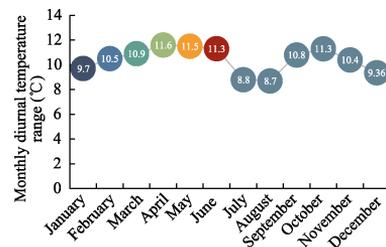


Figure 6 Monthly diurnal temperature range

4.2 Soil Physic-Chemical Properties

The soil type of Fangsi town is brown soil, which is medium loam and sandy loam^[3]. Soil samples from two layers were collected in this study. Cadmium (Cd), chromium (Cr), nickel (Ni), lead (Pb), zinc (Zn), and copper (Cu) content (mg/kg), and pH were measured by the Physicochemical Analysis Center of the Institute of Geographic Sciences and Resources, Chinese Academy of Sciences. The soil samples showed no detectable cadmium (Cd), with the detection of chromium (Cr) in the range of 69.8 to 88.6 mg/kg, nickel (Ni) in the range of 38.7 to 48.2 mg/kg, lead (Pb) in the range of 41.8 to 50.2 mg/kg, zinc (Zn) in the range of 32.2 to 63.0 mg/kg, and copper (Cu) in the range of 22.6 to 25.9 mg/kg. The detection of pH was near neutral and was good for soil microorganisms (Table 2). Sampling tests revealed a good soil environment, and the heavy metal content is far lower than the pollution risk screening value and risk control value designated by the National agricultural soil standard.

Table 2 Soil pH and heavy metals of the case area

Test items	Fangsi town	Fangsi town	Yucheng	Yucheng	GB15618—2018 National standard: arable soil risk	
	(0–10 cm)	(10–20 cm)	(0–10 cm)	(10–20 cm)	Screening value	Control value
pH	6.7	6.9	6.9	6.9		
Cd (mg/kg)	Undetected	Undetected	Undetected	Undetected	0.3	3.0
Cr (mg/kg)	88.6	72.9	70.1	69.8	200.0	1000.0
Ni (mg/kg)	48.2	42.1	38.9	38.7	100.0	
Pb (mg/kg)	50.2	42.7	41.8	43.5	120.0	700.0
Zn (mg/kg)	32.2	63.0	35.8	36.5	250.0	
Cu (mg/kg)	25.9	23.4	22.7	22.6	100.0	

4.3 Water Quality

Surface water and groundwater samples were collected from Fangsi town and its surrounding areas.

The chromium (Cr), manganese (Mn), iron (Fe), nickel (Ni), copper (Cu), zinc (Zn), arsenic (As), cadmium (Cd), and lead (Pb) concentration (mg/L) and pH for aqueous environment in the case area were determined by the Physicochemical Analysis Center of Institute of Geographic Sciences and Resources of the Chinese Academy of Sciences (Table 3, 4). Samples showed that the pH of surface water and groundwater and the content of heavy metals in Fangsi Town meet the National Class I standards of surface water and groundwater.

Table 3 Statistics of surface water quality of the case area

Test items	Fangsi town	Yucheng	GB3838—2002 National surface water standard	
			Class I	Class III
pH	6.6	6.6	6–9	6–9
Cr (mg/L)	0.000	0.000	0.01	0.05
Mn (mg/L)	0.001	0.023	0.1	0.1
Fe (mg/L)	0.001	0.007	0.3	0.3
Ni (mg/L)	0.002	0.001	0.02	0.02
Cu (mg/L)	0.002	0.001	0.01	1.0
Zn (mg/L)	0.000	0.001	0.05	1.0
As (mg/L)	0.008	0.009	0.02	0.05
Cd (mg/L)	0.000	0.000	0.001	0.005
Pb (mg/L)	0.000	0.000	0.01	0.05

5 Varieties and Quality of Wheat and Maize

In the case area, the dominant wheat varieties are *Jimai 44* and *Shiluan 02-1*, and the leading maize variety is *Denghai 605*. The variety and quality data of wheat and maize are provided by Bureau of Agricultural and Rural Affairs of Yucheng city^[5].

5.1 Varieties of Wheat and Maize

Wheat: *Jimai 44* (Figure 7). Accession number is *Lu Wheat 20180018*. This variety is winterness. The seedlings are semi creeping; the plant type is semi compact; the leaf color is light green; the flag leaves rush up; the lodging resistance is good and the ripening color is good. It has a long awn, a white shell, a white grain, and a hard grain among other characteristics.

Wheat: *Shiluan 02-1* (Figure 8). Accession number is *National Wheat 2007016*. This variety is semi-winterness. The seedlings are creeping, with strong tillering ability and high panicle rate. The plant type is compact; the leaf color is light green; the leaf is small and lifted up, and the spike layer is tidy. The spike is spindle type, with short villus, long awn, white shell, white grain, full grain and horny.

Maize: *Denghai 605* (Figure 9). Accession number is *National Maize 2010009*. This variety is compact, with a plant height of 259 cm and a spike height of 99 cm. The spike is long tube type with 18 cm long; the number of rows per spike is 16–18 with reax axis; The grain is yellow and horse tooth shape, while 100 grains weigh 34.4 g.

Table 4 Statistics of groundwater quality in case area

Groundwater environment	Fangsi town	Yucheng	GBT14848–2017 National groundwater standard		
			Class I	Class III	Class IV
pH	6.6	6.4	6.5–8.5	6–9	6–9
Cr (mg/L)	0.000	0.000	0.005	0.05	0.1
Mn (mg/L)	0.000	0.383	0.050	0.1	1.5
Fe (mg/L)	0.000	0.002	0.100	0.3	2.0
Ni (mg/L)	0.000	0.000	0.002	0.02	0.1
Cu (mg/L)	0.000	0.001	0.010	1.0	1.5
Zn (mg/L)	0.000	0.001	0.050	1.0	5.0
As (mg/L)	0.001	0.004	0.001	0.01	0.05
Cd (mg/L)	0.000	0.000	0.000	0.005	0.01
Pb (mg/L)	0.000	0.000	0.005	0.00	0.1



Figure 7 Wheat variety: *Jimai 44*



Figure 8 Wheat variety: *Shiluan 02-1*



Figure 9 Maize variety: *Denghai 605*

5.2 Quality of Wheat and Maize

The wheat quality data are shown in Table 5. *Jimai 44* has a grain bulk density of 788.9 g/L, a grain protein content of 15.4% in grains, a wet gluten content of 35.1%, and a stabilization time of 25.4 minutes. *Shiluan 02-1* has a grain bulk density of 820 g/L, a protein content of 17%–18% in grains, 41% in wet gluten and a stabilization time of more than 20 minutes.

Wheat quality of Fangsi town exceeded National standard GB/T 17892—1999, achieving the first grade of wheat and strong gluten wheat. In a horizontal comparison, it is evident that Fangsi town produces superior wheat compared to those planted in other origins. Pull-breaking force is significantly correlated with crude protein content of wheat flour and stability time, which is the key index for the sensory evaluation of cooked wheaten food^[6]. The wheat varieties in the case area have high protein content and long stabilization time, indicating that they have superior characteristics.

The data of maize variety *Denghai 605* in Fangsi town is shown in Table 6. The grain bulk density of grain is 766 g/L, exceeding national maize standard (Class I); the crude protein content is 9.35%, crude fat content is 3.76%, crude starch content is 73.40%, lysine content is 0.31%, which are higher than that of maize products from other origins.

Table 5 Wheat quality inspection in Fangsi Town

Varieties of wheat	Grain bulk density (g/L)	Grain protein (%)	Wet gluten (%)	Stabilization time (minutes)
<i>Jimai 44</i>	788.9	15.4	35.1	25.4
<i>Shiluan 02-1</i>	820	17–18	41	>20
GB/T 17892—1999 National standard high-quality wheat, strong gluten wheat (Class I)	770	15	35	10
<i>Shiluan 02-1</i> (Luancheng, Hebei province) ^[7]	777	14.34	31.80	12.9
<i>Shiluan 02-1</i> (Mixed samples from Xingtai and Handan, Hebei province, Anyang and Xinxiang, Henan province) ^[8]	787	12.91	31.80	22.0

Table 6 Quality comparison of maize in Fangsi with national standards and maize in other parts of China^[9]

Maize varieties	Grain bulk density (g/L)	Crude protein (%)	Crude fat (%)	Crude starch (%)	Lysine (%)
<i>Denghai 605</i>	766	9.35	3.76	73.40	0.31%
National standard GB 1353—2018 maize (First Category)	720				
Shandong	739	9.8	4.2	71.1	—
Hebei	748	9.1	3.9	71.5	—
Shanxi	753	9.3	3.7	71.3	—
Inner Mongolia	745	8.8	4.1	71.5	—
Liaoning	756	9.2	4.2	71.4	—
Jilin	738	8.8	4.2	71.8	—
Heilongjiang	717	8.4	4.4	71.7	—
Henan	735	9.8	4.0	71.5	—
Shanxi	727	9.4	3.7	71.1	—

5.3 Wheat Products

5.3.1 Wheat Product Standards

The wheat products in the present case study include dumpling flour, steamed bread flour and whole wheat flour in the ready mixed flour of pastry produced by Yucheng Maixiangyuan Food Co., Ltd. The followed standards are: National standard for wheat flour (GB/T 1355—1986), Wheat flour for shandong dumplings (T/SDAS 70—2019), Wheat flour for shandong steamed bread (T/SDAS 71—2019), and Wheat flour for Shandong noodles (T/SDAs 72—2019).

5.3.2 Wheat Product Quality

Dumpling powder, steamed bread flour and whole wheat flour produced by Yucheng Maixiangyuan Co., Ltd. have obtained green food certification. The nutrition test report of the pastry ready mixed powder shows that: The energy content is 1,523 kJ/100g; the contents of protein, fat and carbohydrate are 24.4%, 1.7% and 61.5% respectively.

6 Management and Traditional Culture of Wheat and Maize in Yucheng

6.1 Management

6.1.1 Scientific and Standardized Planting

(1) Agricultural calendar of winter wheat-summer maize planting model. The key periods of winter wheat-summer maize system are listed in Table 7.

(2) Key measures to promote agriculture in case area are summarized as follows:

- 1) Promote agricultural industry through land concentration and crop structure adjustment;
- 2) build a grain industry chain of “institute + government + enterprise + cooperative + service center”; 3) establish an industrial cluster of high-quality wheat along the Yellow

River in Shandong; 4) uplift water use efficiency by using the agricultural decision support system of the CAS; 5) extend quality varieties such as high gluten wheat and quality maize, together with Shandong Seed Group; 6) Build the brand of “37°N High-Quality Wheat”; 7) promote whole-process land trusteeship services, together with Shandong Agricultural Group. Once the Group signs a contract with farmers, it will uniformly provide seed, farming, sowing, pest control, harvesting and other services; 8) Cultivate precision agriculture, and optimize all elements of agriculture (soil, seeds, machinery, etc.)

6.1.2 Long-term Habitat Observation

To better manage wheat and maize in the case area, a billboard for the scope of the case area (Figure 10) and a ground observation station (Figure 11) were set up in Fangsi town. The station is a low-power internet of things sensing system, which can collect key crop growth environment factors all day: landscape, meteorological elements, air quality, soil, water, crop growth, diseases and pests.

Table 7 Agricultural calendar and main field management in case area

Crop	Month	Agricultural calendar	Field management measures
Wheat	Mid and late Sept.	Before sowing	Preparation of seed and fertilizer
	Early to mid Oct.	Wheat sowing	Sufficient fertilizer and fine land treatment to ensure quality
	Mid Oct.–mid Dec.	Before dormancy	Ensure full and even seedlings before winter
	March	Wheat rejuvenation	Tailored irrigation and fertilization for various fields
	April–May	Jointing to grouting	Irrigation and fertilization, prevent diseases and insect pests
	Late May–early June	Wheat ripening	Timely harvest
Maize	Mid and late May	Before sowing	Preparation of seed and fertilizer
	Early to mid June	Maize sowing	Ensure full and even seedlings
	Mid June–early July	Seedling	Ensure strong maize seedlings
	Early July–early Aug.	Jointing–heading	Remove weak plants, apply fertilizer, prevent disease and lodging
	Early Aug. –late Sept.	Heading–maturity	Irrigation and fertilization, timely harvest

6.1.3 Long-Term Habitat Observation

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6.1.4 The Role of Agricultural Enterprises: Yucheng Maixiangyuan Food Co., Ltd.

The business of Yucheng Maixiangyuan Food Co., Ltd. includes wheat planting, flour R &D, pasta processing training, e-commerce, agricultural tourism, etc. It is the first listed enterprise in China for steamed bread, a high standard whole chain enterprise of Chinese staple food, a leading enterprise and standardized wheat planting base in Shandong province. The company’s technologies, “three-time-proofing, three-time-rising, eight-time-noodle-pressing, low temperature proofing production”, have obtained the national patent of new technologies. Aided by Yucheng Agricultural Chamber of Commerce, Maixiangyuan improved its links with local farmers, provided them with unified wheat seeds and standardized field techniques, promoted the large-scale wheat cultivation and uplifted the quality of wheat. Maixiangyuan also cooperated with the Chinese Academy of Sciences to establish a brand staple grain R&D base to enhance the brand value of wheat products.



Figure 10 Case area billboard



Figure 11 Observation station

6.2 History of Land Use

6.2.1 The History of Special Wheat Cultivation

As early as 2000, Shandong conducted the land zoning for special wheat and classified Dezhou into the most suitable area for special wheat^[10,11]. In 2009, the national wheat zoning by the Ministry of Agriculture included five high-quality wheat producing areas, of which Dezhou (Prefecture) is one of the most suitable areas for high-quality strong gluten and medium gluten wheat. Dezhou further detailed the main production areas of special wheat to county-level bases, such as Wucheng, Pingyuan, Qihe, and Yucheng. Wheat is No.1 crop in Yucheng. Normally, the sowing area is 49,000 ha and the yield is 395,000 tons. Yucheng was awarded the “National Super Grain-Producing County”^[4]. Yucheng encourages high-quality wheat processing industry. At present, there are large grain enterprises such as Yufei Flour, Zhanyue Food and Dezhou Jinbo. In 2019, the Guidelines for Grain Industry and Rural Revitalization was published.

6.2.2 Improvement of Saline-Alkali Soil in Yucheng

Before 1960, the proportion of poor soil in Yucheng was as high as 43%, mainly saline and alkali soil. Since the 1960s, scientists from the Chinese Academy of Sciences (CAS), have started the research on the improvement of saline alkali soil in the lower reaches of the Yellow River, and set up research bases. By the late 1980s, large scale (667 ha) saline alkali soil improvement demonstration fields had been established.

Meanwhile, the research base in Yucheng was developed into Yucheng Experimental Station of Chinese Academy of Sciences in 1979, run by the Institute of Geography of Chinese Academy of Sciences (CAS). Over the past 40 years, based on the Station, CAS has developed a number of technical systems to meet the needs in different agricultural stages. For example, “Well Irrigation and Well Drainage” technology for salt and alkali soil improvement in 1960s; “Well, Ditch, Leveling, Fertilizer, and Forest” technology for salt and alkali soil improvement in the 1970s (wheat-maize double cropping is one of the key parts); Comprehensive technology for severe saline-alkali and sandy soil improvement in 1980s; Efficient planting and animal husbandry technology in the 1990s; comprehensive technology for maize production and recycling industry in the 2000s^[12].

Thanks to these saline and alkali soil improvement technologies, the grain yield per unit area under the “wheat-maize double cropping system” in Yucheng city has reached 15 ton /ha in 2021. In the future, with the improvement of farmland infrastructure (ditch, bridge, road, canal, culvert, well, forest and electricity), as well as the construction of the water source project of Shinu lake and the clean-up and siltation project of Tuhai river, the soil

productivity of Yucheng will be further improved, and the maize yield in the core area is expected to be 22.5 ton/ha.

7 Discussion and Conclusion

Fangsi town of Yucheng, located in the alluvial plain of the Yellow River, boasts suitable climate, soil and water resources for quality winter wheat and summer maize double-cropping. Appropriate natural conditions, combined with effective cultivation techniques, have nurtured high-quality wheat and maize products with geographic characteristics. Through this case study, the relevant data and knowledge have been collected, analyzed and published, including the natural geographic data, variety data, management data, and historical data. Based on this effort, we have provided useful ideas and scientific and technological support for Yucheng to promote its rural revitalization and the healthy development of modern agriculture.

Author Contributions

Wang, Z. B. designed the study; Li, K. X. designed sampling and analysis of soil, water and plants, wrote the manuscript; Huang, Y. H. took part in data processing and manuscript writing; Lv, J. L. collected wheat data; Zhou, L., Chen, X., Li, T., Wen, D. H., and Ni, W. T. assisted data collection and logistics; Shao, Y. collected corporate data; Zhu, X. G. installed observation station; Liu, J., Shao, J., and Chen, L. J. participated in the data collection. Wang, Z. B. and Zhou, L. finalized the paper.

Conflicts of Interest

The authors declare no conflicts of interest.

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