Hongyong Sun

1. EDUCATION

PhD, Physical Geography, Graduate School of Chinese Academy of Sciences (Institute of Geographic Science and Natural Resources Research)，2007

M.Sc., Agricultural Ecology, Graduate School of the Chinese Academy of Sciences, China，2003

B.Ag., Faculty of Agronomy, Hebei Agricultural University, 1998

2. PROFESSIONAL EXPEROENCE

Dec. 2016– Present	Professor of Center for Agricultural Resources Research, Institute of Genetics and Developmental Biology, Chinese Academy of Science.
Dec. 2014– Present	Vice Head of Nanpi Eco-Agricultural Experimental Station, Institute of Genetics and Developmental Biology, Chinese Academy of Science.
Dec.2008 –Dec. 2016	Associate Professor of Center for Agricultural Resources Research, Institute of Genetics and Developmental Biology, Chinese Academy of Science.
Oct. 2009-Sep. 2010	Visiting scholar at CSIRO Land and water, Australia
Aug. 2003~ Dec. 2008	Assistant Professor of Center for Agricultural Resources Research, Institute of Genetics and Developmental Biology, Chinese Academy of Science
Aug. 1998~ Aug. 2000	Research Assistant, Shijiazhuang Institute of Agricultural Modernization, the Chinese Academy of Sciences, Shijiazhuang, Hebei Province, China.

3. HONERS AND ACADEMIC AWARDS

2006	The 1st Grade Prize on Science-Technology Progress, by Government of Hebei Province, China
2007	The Prize on Excellent Young Scientist, by Government of Shijiazhuang city, Hebei Province, China
2007	The 2nd Grade Prize on National Science-Technology Progress, by Government of Chinese Government
2008	The 2nd Grade Prize on Natural and Science, by Government of Hebei Province, China

2009 The Award nomination on Excellent Young Scientist, by Government of Hebei, Hebei Province, China

2014 The 2nd Grade Prize on Natural and Science, by Government of Hebei Province, China

2016 The 2nd Grade Prize on Science and Technology progress, by Government of Hebei Province, China

4. MAJOR RESEARCH INTERESTS, SELECTED RESEARCH PROJECTS (research background, major research achievements, current research and future directions)

4.1 BACKGROUND

Fresh water shortage is the major limiting factors for agricultural production in North China Plain. The increasing population would further put more pressure on water resources. Meanwhile, some marginal water isn't used completely in agricultural production, especially the saline water around the Bohai region. Therefore, how to reduce the groundwater pumping and use the saline water to keep the agricultural production is the main issue.

The focus of our group is on the mechanism of water transferring in groundwater soil-plant-atmosphere continuum (GSPAC) and the implications to water saving agriculture. Since the North China Plain located at the semiarid region with a very large variability of annual precipitation, ranging from 200-600 mm, and the uneven seasonal distribution, this region always faces to drought threaten. To reduce crop water consumption and improve the water use efficiency is the major question of the water-saving agricultural study. Thus, this is a trans-disciplinary work combining aspects of agricultural sciences (agronomy, irrigation engineering, and so on), hydrology (soil water, infiltration, evapotranspiration), and ecology (plant physiology and physiological ecology, vegetation phenology).

4.2 MAJOR RESEARCH ACHIEVEMENTS

--The effects of water and salt stress in different growth stage on evapotranspiration, crop growth, and yield for winter wheat.

Limited precipitation restricts yield of winter wheat grown in the North China Plain (NCP). Irrigation experiments were conducted during different growing stages of winter wheat (Triticum aestivum L.) at Luancheng agro-ecology systems station of the Chinese Academy of Sciences during 1999/2000, 2000/2001 and 2001/2002 to identify suitable irrigation schedules for winter wheat. The aim was also to develop relationships between seasonal amounts of irrigation and yield, water-use efficiency (WUE), irrigation water-use efficiency (WUEi), net water-use efficiency (WUEet) and evapotranspiration (ET). A comparison of irrigation schedules for wheat suggested that for maximum yield in the NCP, 300mm is an

optimal amount of irrigation, corresponding to an ET value of 426 mm. Results showed that with increasing ET, the irrigation requirements of winter wheat increase as do soil evaporation but excessive amounts of irrigation can decrease grain yield, WUE, and WUEi. These results indicate that excessive irrigation might not produce greater yield or optimal economic benefit, thus, suitable irrigation schedules must be established.

--Effects of precipitation change on water balance and WUE of the winter wheat –summer maize rotation

Limited precipitation restricts crop yield in the North China Plain, where high level of production depends largely on irrigation. Establishing the optimal irrigation scheduling according to the crop water requirement (CWR) and precipitation is the key factor to achieve rational water use. Precipitation data collected for about 40 years were employed to analyze the long-term trend, and weather data from 1984 to 2005 were used to estimate the CWR and irrigation water requirements (IWR). Field experiments were performed at the Luancheng Station from 1997 to 2005 to calculate the soil water consumption and water use efficiency (WUE). The results showed the CWR for winter wheat and summer maize were similar and about 430 mm, while the IWR ranged from 247 to 370 mm and 0 to 336 mm at the 25% and 75% precipitation exceedance probabilities for winter wheat and summer maize, respectively. The irrigation applied varied in the different rainfall years and the optimal irrigation amount was about 186, 161 and 99 mm for winter wheat and 134, 88 and 0 mm for summer maize in the dry, normal and wet seasons, respectively. However, as precipitation reduces over time especially during the maize growing periods, development of water-saving management practices for sustainable agriculture into the future is imperative.

--Effects of different irrigation schedule on water balance, yield and WUE of winter wheat in the North China Plain.

The North China Plain (NCP) is one of the main grain production regions in China. However, the annual double cropping system of winter wheat and maize consumed a large amount of groundwater, has led to decline in groundwater table. For conservation of groundwater resource, deficit irrigation is promoted to reduce irrigation water use in recent years. This study combined process-based modeling and experimental data together to evaluate the effects of different irrigation strategies on crop production and groundwater table change for the past three decades in NCP. Data from a six year field trial (2006–2012)under four irrigation schedules and 28 year (1984–2012) field experiment under full irrigation was used to test the agricultural production systems simulator (APSIM) to simulate the responses of winter wheat and maize to different irrigation management. The results showed that APSIM

model could well simulate the grain yield and water consumption of the double cropping system under the changing climate and management practices. Simulation results with four irrigation scenarios (critical stage irrigation (CI), minimum irrigation (MI), rainfed (RF) and full irrigation (FI)) from 1984 to 2012 showed that irrigation water use efficiency (IWUE) was highest under CI, although changing from FI would lead to reduction in average annual grain yield by 19.5%, 33.7%, and 58.8% under CI, MI and RF, respectively. Even the minimum irrigation strategy (MI—one irrigation for each crop) will result in continuous decline in the groundwater table, implying an inevitable future shift to alternative cropping systems like dryland wheat-maize system, single wheat or maize. Such change will likely result in lower crop productivity and increased inter-annual variability in crop yields, which will demand improved risk management strategies to minimize loss in bad year while maximize return in good years.

--Soil evaporation process by using different depth micro-lysimeter and the effects of different measures such as straw mulching, tillage, etc. on soil evaporation reduction under the winter wheat –maize double cropping system.

Soil evaporation is the water losses which don't contribute to the agricultural production. How to measure it and quantify in the winter wheat and summer maize cropping system is very important. Field experiments showed that the micro-lysimeter of 15 cm depth is the optimal depth, and the treatment of capping with net can't be used especially after rain or irrigation; the analytic result about the soil evaporation and meteorological factors shows that the RH, VPD and global radiation are the most important factors for affecting the soil evaporation; the soil moisture in 5 cm is also an important element which affects the soil evaporation; The 3 years study shows that the average soil evaporation rate for mulched treatment was 58% smaller than that of non-mulched treatment, especially at the earlier stage of maize when leaf area index was smaller.

--The change trends of climate mainly including temperature and precipitation and their impacts on agricultural production and water management.

Long-term field experimental data provides a good opportunity to evaluate the effects of different management practices and weather factors on maize yield. An 11-year field experiment (2003–2013) with the same maize cultivar and two short-term experiments including different sowing dates and plant densities were conducted at Luancheng Agro-ecological Experimental Station in the North China Plain (NCP).The measured pheonological development, biomass and grain yield were used to calibrate and validate the APSIM-maize model. The results showed that APSIM-maize model could capture the biomass and grain yield of summer maize under the various management practices and weather conditions. After calibration and validation, five scenarios were simulated using the APSIM model. The simulated

results showed that weather factors including sunshine hours and the diurnal temperature range during the grain fill stage had the positive effects on maize yield. For different management practices, plant density was the most important factor which affected the maize yield. The optimal plant density was approximate 8.6 plants/m2. Maize yield would be decreased with the sowing dates delayed after the middle of June. Meanwhile, earlier sowing before the end of May also reduced the grain production. The optimized sowing date and plant density could reduce the seasonal yield variation of maize caused by the weather factors. The findings of this study suggest that the maize plant density should be properly increased and sowing time should be optimized according to the harvesting of its previous crop.

4.3 FUTURE WORK

With increasing fresh water shortage and the food requirement in China, our future research work will be focusing on the mechanism of water cycle at the saline water irrigation, the technology to improve the water use efficiency, and how to adapt to the climate change for the agricultural production, and how to improve the production capacity in the lower yield region.

1) mechanisms of water cycle in farmland under the saline water irrigation, including the evaporation and transpiration process. And the adaption mechanisms of crops to the salt stress.

2) analysis the reasons of yield gap at the different regions, which will be aid to develop the technologies for the improvement of agricultural production.

3) modeling the process of saline water irrigation and agricultural production

4) developing technologies of increasing crop yield in the lower yield region, especially affected by the salt soil and saline water

5 FUNDING AND LABORATORY PERSONNEL

5.1 Fundings

1) Spring maize variety screening for the mechanical harvest and suiting for the high densities and the supporting cultivation technologies, The national key research and development program of China, 2016-2020

2) Experimental study on transpiration of fruit trees from three scaled and its scale transformation. National Natural Science Foundation, 2014-2017

3) Suitable development scale for the agricultural production, STS program of Chinese Academy of Sciences, 2017-2018

4) Rainwater collection and its application in the agricultural production, Bohai granary program of Hebei Province, 2014-2017

5) Studies of technologies of high efficiency utilization and demonstration of multi water resources.

5.2 LABORATORY MEMBERS

Permanent staff

Dr. Hongyong Sun, Professor, Agronomy

Dr. Xinliang Dong, Assistant professor, soil science

Dr. Jintao Wang, Assistant professor, farmland irrigation and water conservancy

Graduate Students

Cui Xiaopeng, 2010-2013 (Master)

Sun Rui, 2017- (Master)

Zhao Changlong, 2017- (Master)

Technician

Mr. Jinyu Guo

Ms. Xinyan Feng

6. SELECTED PUBLICATIONS, PATENTS GRANTED, VARIETIES OBTAINED,

International Journal:

1) **Sun H.Y,** Zhang X.Y., Wang E.L., Chen S.Y., Shao L.W., Qin W.L. 2016. Assessing the contribution of weather and management to the annual yield variation of summer maize using APSIM in the North China Plain. ***Field crops research***. 194:94-102.
2) Liu X.W., **Sun H.Y,** Feike T., Zhang X.Y., Shao L.W., Chen S.Y. 2016. Assessing the impact of air pollution on grain yield of winter wheat –A case study in the North China Plain. ***PLOS one***. 11(9):e0162655
3) **Sun H.Y,** Zhang Xiying, Wang Enli, Chen S.Y. Shao L.W. 2015. Quantifying the impact of irrigation on groundwater reserve and crop production –A case study in the North China Plain. ***European Journal of Agronomy.*** 70:48-56.
4) **Sun H.Y,** Zhang X.Y, Chen S.Y, Shao L.W. 2014. Performance of a Double Cropping System under a Continuous Minimum Irrigation Strategy. ***Agronomy Journal***. 106:281-289

5) **Sun H.Y**., Shao L.W., Chen S.Y., Wang Y.M., Zhang X.Y. 2013. Effects of sowing time and rate on crop growth and radiation use efficiency of winter wheat in the North China Plain. ***International Journal of plant production***. 7(1),117-138.

6) **Sun H.Y.,** Shao L.W., Liu X.W., Miao W.F., Chen S.Y., Zhang Xiying. 2012. Determination of water consumption and the water-saving potential of three mulching methods in a jujube orchard. ***European Journal of Agronomy***. 43:87-95.

7) **Sun H.Y.**, Shen Y.J., Yu Q., Flerchinger G. N., Zhang Y.Q., Liu C.M., Zhang X.Y.. 2010. Effect of precipitation change on water balance and WUE of the winter wheat–summer maize rotation in the North China Plain. ***Agricultural Water Management*** 97, 1139-1145.

8) **Sun H.Y.**, Zhang X., Chen S., Pei D., Liu C. 2007. Effects of harvest and sowing time on the performance of the rotation of winter wheat–summer maize in the North China Plain. ***Industrial Crops Research***, 25, 239-247

9) **Sun H.Y.**, Liu C., Zhang X., Shen Y., Zhang Y., 2006. Effects of irrigation on water balance, yield and WUE of winter wheat in the North China Plain, ***Agricultural Water Management***, 85, 211–218.

10) Zhang XY, Qin W.L., Chen SY, Shao LW, **Sun HY.** 2017. Responses of yield and WUE of winter wheat to water stress during the past three decades—A case study in the North China Plain. ***Agricultural Water Management***, 179:47-54.

11) Liu X.W., Feike T., Shao L.W., **Sun H.Y.,** Chen S.Y., Zhang XY. 2016. Effects of different irrigation regimes on soil compaction in a winter wheat –summer maize cropping system in the North China Plain. ***Catena***. 137:70-76.

12) Lu Y., Zhang XY, Chen SY, Shao LW, **Sun HY.** 2016. Changes in water use efficiency and water footprint in grain production over the past 35 years: a case study in the North China Plain. ***Journal of cleaner production***. 116:71-79.

13) Zhang XY; Zhang XY; Chen SY; **Sun HY**; Shao LW.; Liu XW. 2016. Optimized timing of using canopy temperature to select high-yielding cultivars of winter wheat under different water regimes. ***Experimental Agriculture***. 1-16.

14) Zhang XY; Zhang XY; Liu XW; Shao LW.; **Sun HY**; Chen SY. 2015. Improving winter wheat performance by foliar spray of ABA and FA under water deficit conditions. ***Journal of Plant Growth Regulation***. 35(1):83-96.

15) Zhang XY; Zhang XY; Liu XW; Shao LW.; **Sun HY**; Chen SY. 2015. Incorporating root distribution factor to evaluate soil water status for winter wheat. ***Agricultural Water Management***. 153:32-41.

16) Liu XW; Zhang XY.; Chen SY; **Sun HY**; Shao LW. 2015. Subsoil compaction and irrigation regimes affect the root-shoot relation and grain yield of winter wheat. ***Agricultural Water Management***. 154:59-67.

17) Chen SY, **Sun HY,** Shao LW, Zhang XY. 2014. Performance of winter wheat under different irrigation regimes associated with weather conditions in the North China Plain. ***Crop Science.*** 54(6): 2745-2751.

18) Iqbal M.A., Shen Y.J., Stricevicb R., Pei H.W., **Sun HY.** 2014. Evaluation of the FAO AquaCrop model for winter wheat on the North China Plain under deficit irrigation from field experiment to regional yield simulation. ***Agricultural Water Management***. 135(2):61-72.

19) Zhang XY; Wang SF; **Sun HY**; Chen SY; Shao LW; Liu XW. 2013. Contribution of cultivar, fertilizer and weather to yield variation of winter wheat over three decades: A case study in the North China Plain. ***European Journal of Agronomy***. 50:52-59.

20) Liu XW; Shao LW; **Sun HY**; Chen SY; Zhang XY. 2013. Responses of yield and water use efficiency to irrigation amount decided by pan evaporation for winter wheat. ***Agricultural Water Management***. 129:173-180.

21) Zhang YC; Shen YJ; Xu XL; **Sun HY**; Li F; Wang Q. 2013. Characteristics of the water–energy–carbon fluxes of irrigated pear (Pyrus bretschneideri Rehd) orchards in the North China Plain. ***Agricultural Water Management***. 128:140-148.

22) Wang YZ; Zhang XY; Liu XW; Shao LW; **Sun HY;** Chen SY. 2013. The effects of nitrogen supply and water regime on instantaneous WUE, time-integrated WUE and carbon isotope discrimination in winter wheat. ***Field crops research***. 144:236-244.

23) Cheng F.H., **Sun H.Y.**, Shi H., Zhao Z.J., Wang Q., Zhang J.Y. Effects of regulated deficit irrigation on the vegetative and generative properties of the Pear cultivar 'Yali'. 2012. ***Journal of Agricultural science and technology***. 14:183-194.

24) Zhang X.Y., Shao L.W., **Sun H.Y.**, Chen S.Y., Wang Y.Z. 2012. Incorporation of Soil Bulk Density in Simulating Root Distribution of Winter Wheat and Maize in Two Contrasting Soils. ***Soil Science Society of America Journal***. 76(2):638-647.

25) Zhang X.Y., Wang Y.Z., **Sun H.Y.**, Chen S.Y., Shao L.W. 2012. Optimizing the yield of winter wheat by regulating water consumption during vegetative and reproductive stages under limited water supply. ***Irrigation Science***. DOI: 10.1007/s00271-012-0391-8

26) Shao L.W., Zhang X.Y., **Sun H.Y.**, Chen S.Y., Wang Y.M. 2011. Yield and water use response of winter wheat to winter irrigation in the North China Plain. ***Journal of Soil and Water Conservation***. 66(2):104-113.

27) Zhang X.Y., Chen S.Y., **Sun H.Y.**, Shao L.W., Wang Y.Z. 2011. Changes in evapotranspiration over irrigated winter wheat and maize in North China Plain over three decades. ***Agricultural Water Management***. 98(6) 1097-1104.

28) Zhang, X.Y., Chen, S.Y., **Sun, H.Y.**, Wang, Y.M, Shao, L.W., 2010. Water use efficiency and associated traits in winter wheat cultivars in the North China Plain. ***Agricultural Water Managemen***t doi:10.1016/j.agwat.2009.06.003.

29) Zhang X.Y., Chen S.Y., **Sun H.Y.**, Wang Y.M., Shao L.W. 2009. Root size, distribution and soil water depletion as affected by cultivars and environmental factors. ***Field Crops Research***. 114: 75–83

30) Shao L.W., Zhang X.Y, Chen S.Y., **Sun H.Y.,** Wang Z.H. 2009. Effects of irrigation frequency under limited irrigation on root water uptake, yield and water use efficiency of winter wheat. ***Irrigation. & Drainage***. 58:393-405

31) Zhang, X.Y., Chen, S.Y., **Sun, H.Y.,** Pei, D., Wang, Y.M., 2008. Dry matter, harvest index, grain yield and water use efficiency as affected by water supply in winter wheat. ***Irrigation Science***. 27,1–10.

32) Chen S.Y., Zhang X.Y., Pei D., **Sun H.Y.** & Chen S.L. 2007. Effects of straw mulching on soil temperature, evaporation and yield of winter wheat: field experiments on the North China Plain. ***Annals of Applied Biology***, 150: 261-268.

33) Zhang X.Y., Dong Pei, Chen S.Y., **Sun H.Y.** and Yonghui Yang. 2006. Performance of Double-Cropped Winter Wheat–Summer Maize under Minimum Irrigation in the North China Plain. ***American Society of Agronomy***. 98:1620-1626.

34) Chen S.Y., Zhang X.Y., Chen S.L., Dong Pei, **Sun H.Y.** 2006. Simulation of soil evaporation under different ground coverage with semi-empirical models. Proceedings of SPIE - The International Society for Optical Engineering, v 6298, Remote Sensing and Modeling of Ecosystems for Sustainability III, 2006, p 62982K,.

35) Zhang Y.Q., Liu C.M., Lei Y.P., Tang Y., YU Q., Shen Y.J. and **Sun H.Y.**. 2006. An integrated algorithm for estimating regional latent heat flux and daily evapotranspiration. ***International Journal of Remote Sensing***. 27: 129–152,.

36) Zhang X.Y., Chen S.Y., Liu M.Y., Pei D., **Sun H.Y.** 2005. Improved water use efficiency associated with cultivars and agronomic management in the North China Plain. ***Agronomy Journal***, 97: 783–790.

37) Zhang X.Y., Chen S.Y., Liu M.Y., Pei D., **Sun, H.Y.** 2005. Evapotranspiration, yield and crop coefficient of irrigated maize under straw mulch. ***Pedosphere***, 15: 576–584.

38) Shen Y.J., Zhang Y.Q., Kondoh A., Tang C.Y., Chen J.Y., Xiao J.Y., Sakura Y., Liu C.M., **Sun H.Y.**

2004. Seasonal variation of energy partitioning in irrigated lands. ***Hydrological Process***., 18(12): 2223-2234.

39) Zhang Y.Q., Liu C.M., Yu Q., Shen Y.J., Kendy E., Kondoh A., Tang C.Y., **Sun H.Y.** 2004. Energy fluxes and the Priestley-Taylor parameter over winter wheat and maize in the North China Plain, ***Hydrological Process***., 18(12):2235-2246.

40) Zhang Y.Q., Kendy E., Yu Q., Liu C.M., Shen Y.J. and **Sun H.Y.**, 2004. Effect of soil water deficit on evapotranspiration, crop yield, and water use efficiency in the North China Plain, ***Agricultural Water Management***, 64: 107-122.

Domestic Journal:

1) **Sun Hongyong**, Zhang Xiying, Chen Suying, Shao Liwei, Wang Yanzhe, Liu Ketong. Effects of dificit irrigation on physio-ecological indicates of winter wheat. Chinese Journal of Eco-agriculture, 19(5): 1086-1090, 2011.

2) **Sun Hongyong**, Zhang Xiying, Chen Suying, Shao Liwei, Wang Yanzhe, Dong Bofei. Analysis of field water consumption, its pattern, impact and driving factors. Chinese Journal of Eco-agriculture, 19(5): 1032-1038, 2011.

3) **Sun Hongyong**, Zhang Xiying, Chen Suying, Wang Yanmei, Shao Liwei, Gao Lina. Effect of meteorological factors on grain yield of summer maize in the North China Plain. Chinese Journal of agrometeorology. 30(2):215-218, 2009.

4) **Sun Hongyong**, Chen Suying, Zhang Xiying, Wang Yanmei. A removable irrigation device for field crops. Agro machine study. 4: 95-97,2009.

5) **Sun Hongyong**, Zhang Xiying, Shao Liwei. Regulated deficit irrigation and its application on fruit trees. Chinese Journal of Eco-agriculture, 17(6): 1288-1291, 2009.

6) **Sun Hongyong**, Liu Changming, Wang Zhenhua, Zhang Xiying, Dong Bofei. Changing trend of precipitation and its effects on crop productivity in piedment of Taihang Mountain. Chinese Journal of Eco-agriculture, 15(6): 18-21, 2007.

7) **Sun HongYong**, Hu ChunSheng, Zhang XiYing, Chen SuYing, Pei Dong. Effects of the change of temperature and precipitation in recent 40 years on the agricultural production in Sanhe City. Chinese Journal of Eco-agriculture, 14(2): 173-176, 2006.

8) **Sun Hongyong**, Liu Changming, Zhang Xiying, Zhang Yongqiang, Shen Yanjun, Effects of the different length micro-lysimeters on the evaporation. Jour. of Northwest Sci. Tech. Univ. of Agri. and For. 31 (4): 167-170, 2003.

9) **Sun Hongyong**, Liu Changming, Zhang Yongqiang, Zhang Xiying, Effects of Water Stress in Different Growth Stage on Water Consumption and Yield in Winter Wheat. Journal of Irrigation and Drainage, 22 (2): 12-14, 2003.

10) **Sun Hongyong**, Zhang Xiying, Zhang Yongqiang, Liu Changming, Determination of daily evaporation and evaportranspiration of summer corn fields by Large- scale Lysimeter and Micro-Lysimeters. Agricultural Research in the Arid Areas, 20 (4): 72-75, 2002.

11) **Sun Hongyong**, Liu Changming, Zhang Xiying, Chen suying and Pei dong. Effects of different row spacing on soil evaporation, evapotranspiratlon and yield of winter wheat. Transactions of the CSAE, 22(3) : 22–26, 2006.

12) **Sun hongyong**, Liu Changming, Zhang XiYing, Zhang Yongqiang, Pei Dong. The changing laws of the diurnal evapotranspiration and soil evaporation between plants in the winter wheat field of the North China Plain. Chinese Journal of Eco-Agriculture, 12(3):62-64, 2004.

13) **Sun Hongyong**, Liu Changming, Zhang Yongqiang, Zhang Xiying. Study on soil evaporation by using micro-lysimeter. Journal of Hydraulic Engineering, (8): 114-118, 2004.

14) **Sun Hongyong**, Zhang Xiying, Chen Suying, Chen Silong, Sun Zhenshan. Study on Characters in Winter Wheat Canopy Structure under Different Soil Water Stress. Journal of Irrigation and Drainage, 24(2):31-34, 2005.

15) **Sun Hongyong**, Zhang Yongqiang, Zhang Xiying, Mao Xuesen, Pei Dong, Gao Lijuan. Effects of Water Stress on Growth and Development of Winter Wheat in the North China Plains. Acta Agriculturae Boreali-Sinica, 18(3): 23–26, 2003.

16) Chen Silong, Chen Suying, **Sun Hongyong**, Zhang Xiying, Pei Dong. Effect of Different Tillages on Soil Evaporation and Water Use Efficiency of Winter Wheat in the Field. Chinese Journal of Soil Science, 37(4): 817-820, 2006.

17) Chen Silong, Pei Dong, Wang Zhenhua, Zhang Xiying, Chen Suying, **Sun Hongyong**. Influence of irrigation modes on water consumption and yield of cotton with drip irrigation under plastic mulch in North China Plain. Agricultural Research in Arid Region, 23(6): 26-31, 2005.

18) Chen Silong, **Sun Hongyong**, Chen Suying, Zhang Xiying, Sun Zhenshan, Pei Dong. Analysis on Chlorophyll Fluorescence of Flag Leaves for Different Winter Wheat Varieties. Journal of Triticeae Crops, 25(3) : 57～62, 2005.

19) Chen Silong, Zhang Xiying, Chen Suying, **Sun Hongyong**, Pei Dong. Variation and Interrelationship of Winter Wheat Canopy-air Temperature Difference, Leaf Water Potential and Crop Water Stress Index under Different Water Supply Conditions. Journal of Triticeae Crops, 25(5): 38-43, 2005.

20) Chen Suying, Hu Chunsheng, **Sun Hongyong**, Zhang Xiying, Pei Dong. Preliminarily Analysis on Water- saving Planting Structure of Crops and Supplying Water Safely in Beijing. Journa1 of Arid Land Resources and Environment, 20(2): 33-36, 2006.

21) Chen Suying, Zhang Xiying, Pei Dong, **Sun Hongyong**. Effects of corn straw mulching on soil temperature and soil evaporation of w inter wheat field. Transactions of the CSAE, 21 (10) : 171- 173, 2005.

22) Chen Suying, Zhang Xiying, Pei Dong, **Sun Hongyong**. Soil Evaporation and Soil Temperature in Maize Field Mulched with Wheat Straw. Journal of Irrigation and Drainage, 23(4):32-36, 2004.

23) Dong Baodi, **Sun Hongyong**, Zhang Xiying, Liu Mengyu, Chen Suying. Methods of trouble shooting about the abnormal CO2 value in measuring photosynthesis. Chinese Journal of Scientific Instrument, 28（4） Supp. (1): 38-40, 2007.

24) Gao Yanjun, Zhang Xiying, Chen Suying, **Sun Hongyong**, Pei Dong, Chen Silong. Discrepancies of WUE of Different Winter Wheat Varieties and Analysis of the Interrelated Factors. Journal of Irrigation and Drainage, 23（5）: 45-49, 2004.

25) Li Xinbo, **Sun Hongyong**, Zhang Xiying, Shen Yanjun, Dong Baodi, Hu Chunsheng. Analysis of irrigation demands and evapotranspiration in the Piedmont of Taihang Mountain. Tansactions of CSAE, 23(2): 26-30, 2007.

26) Pei Dong, Zhang Xiying, Chen Suying, **Sun Hongyong**, Liu Mengyu. The effects of irrigation types on the yield and water use of winter wheat. Agricultural Research in Arid Region, 22(4): 60-64, 2004.

27) Wang Zhenhua, **Sun Hongyong**, Zhang Xiying, Chen Suying, Pei Dong. Response of photosynthesis of different winter wheat cultivars to environmental factors. Acta Agriculture Boreali-sinia, 22(1):9-12, 2007.

28) Zhang Yongqiang, Shen Yanjun, Yu Qiang, Liu Changming , Kondoh A., Tang Changyuan, **Sun Hongyong**., Jia J.. Variation fluxes of water vapor, sensible heat and carbon dioxide above winter wheat and maize canopies. Journal of Geographical Sciences, 12 (3): 295-300, 2002.

29) Zhang Yongqiang, Liu Changming , Yu Huning, **Sun Hongyong**. Coupling analysis of water vapor flux between canopy and atmosphere in a farmland, Journal of Agricultural University of Hebei, 25(3): 28-32, 2002.

30) Zhang Yongqiang, Mao Xuesen, **Sun Hongyong**, Li Wenjie. Effects of drought stress on chlorophyll fluorescence of winter wheat . Chinese Journal of Eco-Agriculture, 10(4):13-15, 2002.

31) Zhang Yongqiang, Shen Yanjun, Liu Changming, Yu Qiang, **Sun Hongyong**, Jia Jinsheng, Tang Changyuan, Akihiko Kondoh. Measurement and Analysis of Water, Heat and CO2 Flux from a Farmland in the North China Plain. Acta Geographica Sinica, 57(3): 333-342, 2002.

Conference paper:

1) **Sun H.Y.,** 2007. Effect of precipitation change trend on the crop productivity in the NCP. International Conference on Long-term Ecological Research. (oral presentation)

2) **Sun H.Y.,** 2007. Using various limited soil property data to estimate the soil water content and plant growth in the North China Plain. International Conference on Precision Conservation (poster presentation)

3) **Sun H.Y.**, Shen Y.J., Liu C.M., Zhang X.Y. and Yu Q.. 2006. Measurement of Evapotranspiration and Evaporation Using Large-scale Lysimeter and Micro-lysimeters in North China Plain. 3rd International Symposium on Integrated Water Resources Managemen (poster presentation)

4) **Sun H.Y,.** Liu C.M., Zhang X.Y., Yu Q., Chen S.Y., Chen S.L., Pei D. 2006. Effect of tillage practices on soil moisture and water use of winter wheat in Northern China. Hydrological Science for manageming water resources in Asian developing world. (poster presentation)

5) **Sun H.Y.,** 2006. Effect of precipitation change on water balance and WUE of the major crops in the NCP. International Workshop on Water Cycle and Sustainable Use of Water Resources (oral presentation)

6) **Sun H.Y.**, Shen Y.J., Liu C.M., Zhang Y.Q. 2006. Sustainable water management in irrigation regions: understanding the impact of rainfall trend on crop productivity in the North China Plain. 1st International Conference on the Theory and Practices in Biological Water Saving (poster presentation)

中文期刊：

1. **孙宏勇**，刘小京，巨兆强，郭凯，董博飞。河北沧州国家农业科技园区发展模式探讨。中国生态

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