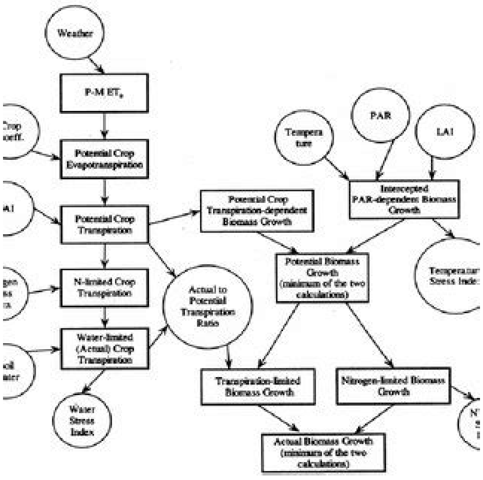

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The model simulates the soil water budget, soilplant nitrogen budget, crop canopy and root growth, dry matter production, yield, residue production and decomposition, and erosion. Management options include cultivar selection, crop rotation including fallow years, irrigation, nitrogen fertilization, tillage operations over 80 options, and residue management. Growth is described at the level of whole plant and organs. Crop development is simulated based on thermal time required to reach specific growth stages. The accumulation of thermal time may be accelerated by water stress. Thermal time may also be modulated by photoperiod and vernalization requirements whenever pertinent. Daily crop growth is expressed as biomass increase per unit ground area. The model accounts for four limiting factors to crop growth water, nitrogen, light, and temperature. The water budget in the model includes precipitation, irrigation, runoff, interception, water infiltration, water redistribution in the soil profile, crop transpiration, and evaporation. The nitrogen budget in CropSyst includes N transformations, ammonium sorption, symbiotic N fixation, crop N demand and crop N uptake. Validation work performed using data from US locations and from northern Syria have indicated a satisfactory performance of CropSyst. ClimGen generates synthetic daily weather data in locations where daily climatic data, required by CropSyst, are not available, unreliable or too erratic to be representative. Reliable generated daily weather data must have similar statistical characteristics as actual weather data for a given area. ClimGen generates daily maximum and minimum temperature, and precipitation from either daily weather data, if available, or from monthly summaries. However, their management cannot be analyzed independently of weather, soil characteristics, field hydrology, crop characteristics, crop rotation, and management factors.http://zavalasministorage.com/assets/media/foxconn-motherboard-p4m800p7ma-manual.xml

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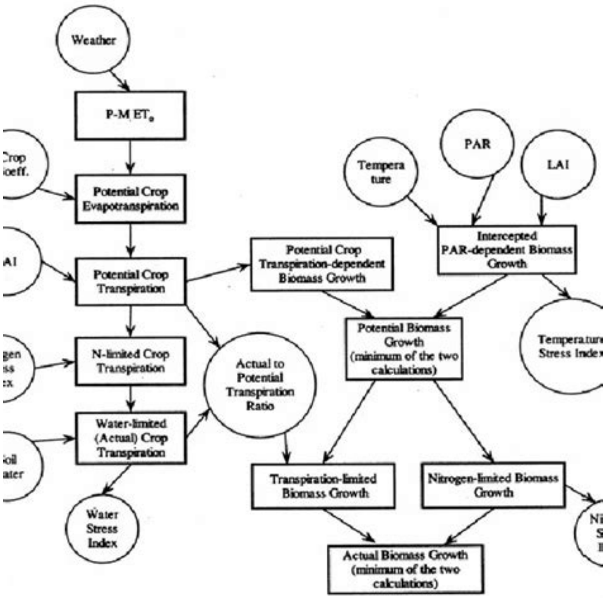
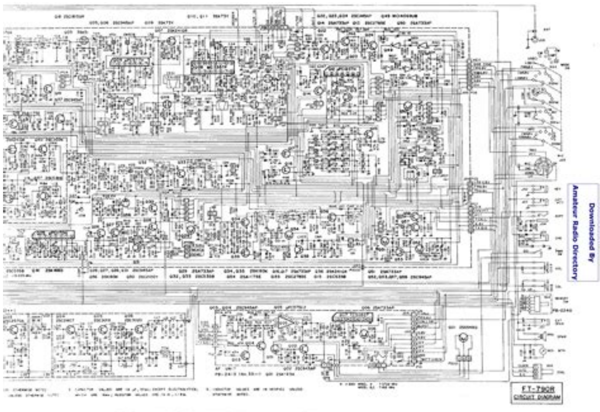


This paper describes the water, nitrogen, and crop growth components of CropSyst, a comprehensive cropping systems simulation model, and provides preliminary verification of these components. The water budget of the model properly describes crop water use. Predicted nitrogen contents throughout the soil profile did not exactly match the measured values from leaching experiments, but they did follow the general trends of the data. The agreement between simulated and observed biomass and yield of corn, winter wheat and spring wheat grown in two locations with a total of 77 data points was good as shown by several statistical indicators. Based on this preliminary validation, CropSyst appears promising as a tool to analyze management practices for water and nitrogen. Additional validation of model components, including a wide range of crops and conditions, should be conducted in the future. Previous article in issue Next article in issue Recommended articles Citing articles 0. A contribution from the Agricultural Research Center, Washington State University, Pullman, WA 99164, USA. Recommended articles No articles found. Citing articles Article Metrics View article metrics About ScienceDirect Remote access Shopping cart Advertise Contact and support Terms and conditions Privacy policy We use cookies to help provide and enhance our service and tailor content and ads. By continuing you agree to the use of cookies. Then, the model was used to predict the aboveground biomass, grain yield and ET crop. Results reveal that the CropSyst model was able to track the aboveground biomass, grain yield, ET crop and N uptake progress throughout the season when compared with observed data from the filed experiments. Statistical analysis showed a high correlation between simulated versus observed data with values of correlation coefficient R2 between 0.93 and 0.99.http://1carl.com/userfiles/foxconn-n15235-manual-download.xml

Running simulation showed that increasing soil water increased simulated aboveground biomes, grain yield and ET crop while N uptake was not effected by increasing soil water. In general, the CropSyst model was useful to use particularly in the long term cropping system and climate change strategy. However future research should be done to evaluate the model for a wider use and different conditions and regions. Download fulltext PDF Then, the model was used to predict the aboveground biomass, grain yield and ET crop. Results reveal that the CropSyst model was able to track the aboveground biomass, g rain yield, ET crop and N uptake progress throughout the season when compared with observed data from the filed experiments. Statistical analysis showed a high correlation between simulated versus observed data with values of correlation coefficient R 2 between 0.93 and 0.99. Running simulation showed that increasing soil water increased simulated aboveground biomes, grain yield and ET crop while N uptake was not effected by increasing soil water.In general, the CropSyst model was useful to use particularly in the long term cropping system and climate change strategy. However future research should be done to evaluate the model for a wider use and different conditions and regions. INTRODUCTION In Egypt, water is a scarce natural resource for crop production. The agricultural sector uses about 83% of the total water resources Abu Zeid, 1999. With increasing population, serious water shortages well occur and slow down further agricultural development. The great challenge for the coming decades will therefore be t he task of increasing food production with less water especially in areas located in arid and semiarid regions FAO, 2002. Wheat is the most important winter cereal crop in Egypt used as a major food crop.

Therefore, increasing wheat production is very important; this is done by increasing newly reclaimed area and increasing yield per unit area which can be accomplished via improved agronomic practices including the use of high yielding cultivars and efficie nt irriga tion management as well as fertilization. The importance of N for wheat in arid regions has increased the use of N fertilizers, particularly in the past two decades causing increased production of the wheat grains Pala et al. 1992. The impact on productivity of water application and N fertilization can not be analyzed independently of weather, soil characteristics, field hydrology, crop characteristics and rotation, among other factors. To develop best management practices BMPs, Pala et al. 1996 stated that it is necessary to integrate these factors into a comprehensive cropping systems approach. A successful method of determining BMPs would provide valuable information to meet the growing demand for agricultural products and in the same time minimizing the environmental impact of agricultural activities and this can hardly be obtained by simple reliance on conventional field experimentation. Computer simulation models, which are able to capture the long term effects of weather fluctuations a nd the effects of various soil properties and management practices on the soil water balance, Such models should improve the efficacy of decision making for fe rtilizer and water management. The field experiments are required for model calibration and validation, which are the necessary steps before application of the model can be developed for a given region. In anticipation of future applications of the CropSyst model in the region, the objective of this study was to evaluate its ability to simulate growth, yield, wa ter and nitrogen use of a whe at cultivar grown under different water and N regimes in Middle Egy pt at the Giza Research Station of Agriculture Research Center of Egy pt.



Th e exper iment wa s laid out in a split plots d esign w ith thr ee re plicate s. The plot area w as 20. 0 m 2 4 x 5 m. The main p lots we re assi gned to irrig ation pa n coef ficient t reatme nts and the subp lots we re as signed to nit rogen levels. Sowing date s were 8 th and 1 st Dece mber for the fir st and second seasons, respec tively. Plants were harvest ed on 6 th and 2 nd o f May for the two re spectiv e seas ons. The prece ding c rop was sunflower in the two season s. Ir rigatio n was practi ced according to the accumulative values of the daily evaporation recor ds from c lass A p an estab lish in G iza Agr o cilame tologic al Statio n for the different irrigati on treatments. Applica tion of irri gation regime treatm ents started from the third irriga tion and corre sponded to Evapor ation Pan Coe fficien t EPC. Treat ments wer e a s follows I 1 1.25 EPC; I 2 1.00 EPC and I 3 0.75 EPC. Water consumptive use CU was determined via soil samples from the sub plots just before each irrigation and 48 hrs later as well as at harvest. Sampling depths were 15 cm successive layers down 60cm depth of the soil prof ile. Weathe r data fro m a Agro met ologica l Station loca ted at the Giza Lat 3003, L ong 31,1 3 and sea lev el 19.5 m 50 m from the experim ental site were recorded.Therefore, the weather data repres ent the field con ditions rea sonably well. Precip itation, maximum and minimum tempe ratures, sunshine and solar radiation were measured on a daily basis in each g rowing season f or the mo del and th en summar ized as monthl y weat her data in Table1. Irrig ation inte rval day s are pr esented in Tab le 2 I t was develo ped by the B iologica l Sy stems En gineer ing Department, Washing ton State Universit y Stockle and Nelson 2001 to serve as an analy tical tool to study the effect of crop ping system managem ent on produc tivity and the environme nt.

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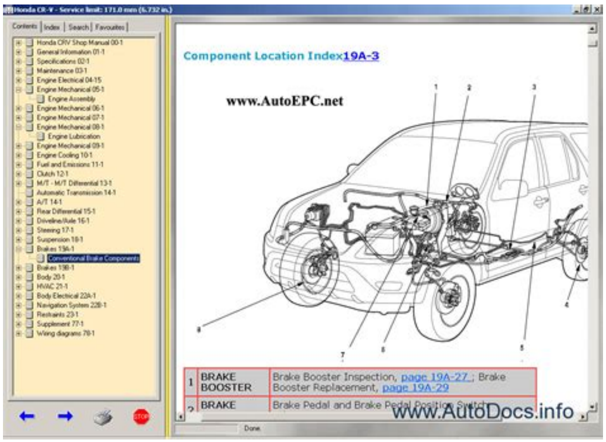

The mode l sim ulates the soil wate r budge t, soilpla nt nitrog en budget, crop cano py and root g rowth, dry matter production, grain y ield, residue production and growing season length. Simulat ion Mode ls para meter require ments Simulati on f iles contain infor mation allowi ng t he u ser to buil d simulat ion conditions from a database of existing loca tion, soil, crop, and management files. Simulat ion files also contain information regar ding th e period of simulatio n and initi al values for varia bles, whi ch requir e initia lization. Weather databas e file include s daily maximum and minimum temp eratur es, preci pitation i n real daily weather datab ase format DA T or the Universal Environ mental Data UED file s g enerat ed b yClimG en can be used direct ly by CropSy st for climat e chang e sce narios. 2 Soi ls Data The Giza soil is a mo ntmorill onitic, t hermic, deep Ab del Wahed 1983. Depth, cm Field capaciy Wilting point Available water Bulk density 0015 1530 3045 4560 41.9 33.7 28.4 28.1 18.6 17.5 16.9 16.5 23.24 16.18 11.46 11.51 1.15 1.20 1.22 1.28 Table 4 Some physical and chemical properties of the soil at Giza. Particlesize distribution Soil fraction Content % Coarse sand 2.91 Fine sand 13.40 Silt 30.51 Clay 53.18 Textural class Clay Soil chemical analyses Content Organic matter 1.80% Available N KClextract 40. 0 mg kg1 Available P Na bicarbonate extract 19.0 mg kg1 Available K NH4 a acetate extract 304 mg kg1 pH 12.5, soil water suspension 7.4 The crop and other input parameters calibrated are marked in Table 5. Growing season duration valu e pa tterns of bo th season s were als o having a simil ar patter n. Growing season duration values were 149 an d 153 day for seaso n 1 and 2, respe ctively. Throug hout the expe riment, all other yiel d componen ts increas ed due to increa sed N fertiliza tion and also increa sed with increa sing Evapor ation Pan Coe fficie nt EPC.

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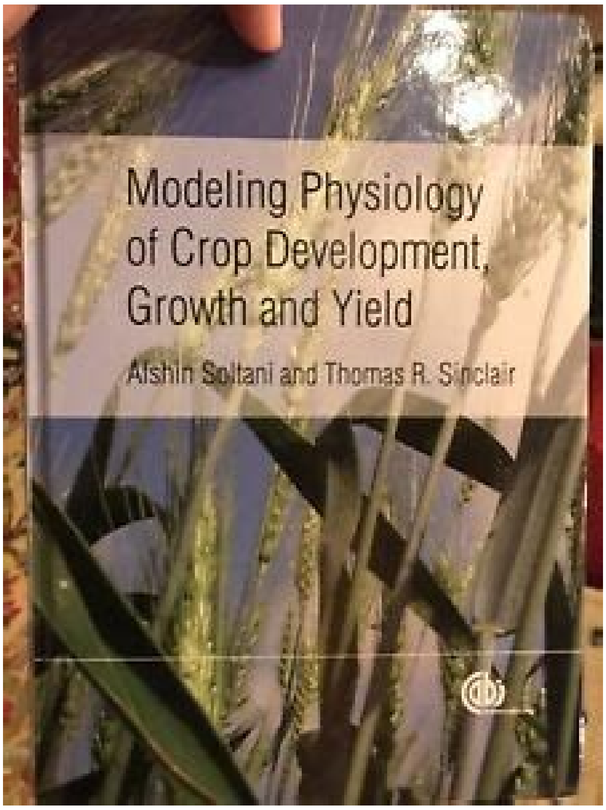

The mo del per formanc e Crop m odel Ca libratio n Calibration of crop input parameters allowed the CropSyst model to perform satisfa ctorily in mimi cking the changes througho ut the growin g season. Also abovegr ound biomass, gra in yield, ET, and N uptake at harvest for all treatme nt combinations were simulated reason ably well. Crop V alidation Data se lected for vali dation we re colle cted fr om field at Giza regio n to represen t the major con ditions e.g. Et crop, growing season durati on, final grain yield and biomess f or the two gr owing sea sons. Change perce ntage ranged from 0.94 to 1. 05 % wh ile valu es of corre lation coeffi cient R 2 ranged betwee n 0.93 and 0.99 for the tested variab les, an d the mo st simila r ones were g rowing seaso n dura tion, g rain yiel d values and Et crop while biologica l yield value s were rather differ ent. On other hand the selected cultivar Giza168 was superior in matchin g with the model. This trend was true in both growing seasons. I n gener al, valida tion results were ac ceptab le for th e purpos e of the st udy, w hich indi cates tha t the CropSy st model is valid for predictin g wheat crop production and water require ment un der mid dle Egy pt Giza e nvironme ntal co ndition. The statistical analysi s results as recorded in table 8 indicate that ETc was predict ed very closel y to the actual ET values with correlati on coeff icient R 2 values of 0.99 and 0.94 while root mean error square RMES we re 1.68 a nd 4.73 for both seasons, respec tively Fig ures 3a,b. On the oth er hand ET val ues varie d due to Evapo ration Pan Coefficie nt. The ET values increase d as EPC values increase d but ET crop value showed diminutiv e effec t due to N l evels. Th is my b e due to th e models phonolo gy response to N uptak e by plant and possible variatio ns with low lev el of n itroge n. Regar ding grain yield, the same trend was true in both growing season s with R 2 values b eing 0.99, 0.93 and RMES w ere 0.082 and 0.

254 Figure s 1a, 2a. Aboveg round biomes pre diction values followed clos ely the 11 line when plotte d against the observed data and R 2 values of 0.0.93 and 0.94 f or se ason 1 and 2, respect ively while root me an err or squa re RMES were 0.444 and 0.664 for the sam e respectiv e seasons Figures 1b, 2b. Regarding irrigat ion treatme nt, predic ted aboveg round biome s values increased positive ly with increases reached to 24 and 31 % with The sam e trend w as foun d with resp ect to N levels. The statistical analysi s indicate that growin g season duration was predic ted very closely to the actual val ues wit h R 2 val ue of 0.99 and RMES values of 1. 32 and 1.26 fo r s eason 1 and 2, re spectiv ely. However, althoug h over estima tion occur red in the uppe r end of the N uptake rang

e, predict ed values of respons e to N level were increa sed with increased N application le vels. N use eff icienc y as pointed in table 9, showed very high response to the model with value betwee n 0.98 and 1.00. All o ther simul ated deta ils are r ecorded in tables 8 and 9 as a sample o f daily outp ut files. Table 8. Statistical summary com paring simulated vs.CONCLUSIONS These results for site and years need to be extrapolated in time longterm responses and to other regions in order to be more useful. The study suggests that the use of crop modeling, after proper calibration and validation may be a feasible approach for such future extrapolations as climate change and other crop prediction studies, especially with linking the model with the weather generator Cli mGin v 4 and GSP techniques. It may be recommended that more research is necessary to evaluate CropSyst in other regions. REFERENCES Abdel Wahed, A. 198 3. Re searc h re port on soil s urvey. S oil Su rvey EMCIP Res. Exten sion Cente rs. Public ation. No.62 Consort ium for Inte rnationa l Developm ent. ARC, Ca iro May 1983.FAO Water Reports No. 22, Rome, Italy. Israelsen, O.W.and V.E.Hansen 1962.

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Irrigation principles and practices.3 rd ed., John Wiley and Sons Inc., New York,USA. James, L.G. 1 988. Pri nciples of farm irrig ation sy stem design. John Wiley and Sons, Inc., NY, USA. Pala, M.,C. O. Stoc kle and H. C. Harri s.199 6. Simu lation of durum wheat tr iticum durum growth under diffe rential water and nitrogen regim es in a med iterra nean t ype of en vironmen t using Crop Syst. Agric ultural Sy stems. Pala, M., Matar, A., Mazid, A., and El Hajj, K. 1992. Wheat respo nse to nitrog en and phosp horus fer tilizatio n under vari ous environ mental conditi ons of northe rn Syria. Biolog ical Systems Enginee ring Departmen t, Washing ton State Univer sity, Pullm an,USA. Stockle C.O., G.S.Ca mpbell an d R.Nelson.1 997. ClimGe n for Windows, a weath er genera tor program. Biologica l Systems Engine ering Dep t., Washi ngton Sta te Unive rsity, Pullman, WA. Stockle, C. O., a nd Ne lson, R., 199 4. Crop ping Syste ms Simul ation Model Users Manual. Version 1.02.00, Biolo gical Systems Engine ering Dep t., Washi ngton Sta te Unive rsity, Pullman, USA. Agric ultural Sy stems 463 35 359. Researches have used various data mining techniques, machine learning methods to real life agricultural datasets to very positive conclusions. Most of the papers concluded the results from application of data mining much more accurate compared to even experts. There researchers have used techniques like ID3 decision tree. Optimization algorithms, Bayesian classification, WEKA, Clustering techniques, MBA algorithms and many others. One if the biggest challenges faced by the researchers is the dataset itself. The dataset available in the field of agriculture is unclean. The datasets come with lot of missing values, duplicate entries and many other wide differences requiring multiple efforts in cleaning of data itself though many researches used thisSciMansoura Univ.,25747274735.

Cropping System Simulation Model Users Manual ClimGen for Windows, a weather generator program Cropping Systems Simulation Model Users Manual. Version 1.02.00 Jan 1994 335359 C O Stockle R Nelson Usa Stockle G S Campbell R Nelson Wa Stockle C O Nelson Stockle C.O. and R. Nelson.2001. Cropping System Simulation Model Users Manual. Biological Systems Engineering Department, Washington State University, Pullman,USA. Stockle C.O., G.S.Campbell and R.Nelson.1997. ClimGen for Windows, a weather generator program. Agricultural Systems 46335359. Cropping Systems Simulation Model Users Manual Jan 1994 C O Stockle Stockle, C. O., and Nelson, R., 1994. Cropping Systems Simulation. Model Users Manual. Version 1.02.00, Biological Systems. Engineering Dept., Washington State University, Pullman, USA. ClimGen for Windows, a weather generator program Jan 1997 C O Stockle G S Campbell R Nelson Stockle C.O., G.S.Campbell and R.Nelson.1997. ClimGen for. Windows, a weather generator program. Biological Systems. Engineering Dept., Washington State University, Pullman, WA. Research report on soil survey Apr 1983 Abdel Wahed Abdel Wahed, A. 1983. Research report on soil survey. Soil Survey

ARC, Cairo May 1983. Irrigation Principles and Practices Article Jun 1963 GEOGR J S. Gregory Orson Winso Israelsen Vaughn E. Hansen View Wheat response to nitrogen and phosphorus fertilization under various environmental conditions of northern Syria. Fertilizer Use Efficiency under Rainfed Agriculture in West Asia and North Africa Conference Paper May 1991 M. Pala Matar. A. Ahmed Mazid El Hajj. K. View Simulation of Durum wheat Triticum turgidum ssp. Durum growth under different water and nitrogen regimes in a Mediterranean environment using CropSyst Article Feb 1996 M. Pala Claudio Stockle H.C. Harris CropSyst, a cropping system simulation model, was evaluated for its ability to simulate growth, yield, and water and nitrogen use of two wheat cultivars Cham 1 and Hourani.

Soil characteristics, initial conditions of available moisture, N and organic matter, and daily weather data were input to CropSyst. Crop input parameters were mostly selected from the model documentation or determined from the experimental data. A few cultivarspecific parameters were adjusted within a narrow range of typical fluctuation by model calibration. Results showed that CropSyst was generally able to simulate evapotranspiration, crop N content, green leaf area, aboveground biomass, and grain yield as observed in the field experiments. Overall, the magnitude of the root mean square errors was about 10% of the observed means with two exceptions 25% and 32%. However, their management cannot be analyzed independently of weather, soil characteristics, field hydrology, crop characteristics, crop rotation, and management factors. This paper describes the water, nitrogen, and crop growth components of CropSyst, a comprehensive cropping systems simulation model, and provides preliminary verification of these components. The water budget of the model properly describes crop water use. Predicted nitrogen contents throughout the soil profile did not exactly match the measured values from leaching experiments, but they did follow the general trends of the data. The agreement between simulated and observed biomass and yield of corn, winter wheat and spring wheat grown in two locations with a total of 77 data points was good as shown by several statistical indicators. Based on this preliminary validation, CropSyst appears promising as a tool to analyze management practices for water and nitrogen. Additional validation of model components, including a wide range of crops and conditions, should be conducted in the future.

December 2018 Icar Cssri Reclamation of sodic Vertisols for crop production is of prime importance in view of the everincreasing demandAmong the amendments gypsum is the cheapest and most convenient sourceDistillery spent washThe plant height, effective tillers,The uptake of Ca, Mg and K was increased while Na uptake was reduced inThe ESP of the soil was reduced from initial 38.8 to 17.1 after twoA total five years experimental field observations 200910 to 201314 comprising four sowing dates, viz. Among the five years observations, initial two years observations 200910 and 201011 were used for model parameterization and remaining years observations 201112 to 201314 were used for model performance evaluation. The results indicated that the model was able to predict the wheat phenology precisely in terms of mean bias error MBE and root mean square error RMSE which was less than 6 days for all the phenological stages except maturity date on Dec 15 sowing. Nov 15 sowing has resulted in maximum grain and biological yield and found to be optimum date for sowing followed by Nov 30 for this region while Dec 15 resulted in highest yield reduction. It was also observed that CropSystmodel was efficient in simulation of yield and biomass of wheat crop during various years of observations. However, it failed to predict the leaf area index LAI precisely. It may also be concluded that the model error were less for early and normal sown crops but increased with the delay in sowing. A large number of research results showed that successive cropping of rice and wheat resulted in a series of problems such as hindering nutrition absorption, gradual degeneration of soil fertility, decline of soil organic matter, and increased incidence of diseases and pests. This paper reviews the relevant data and experiences on ricewheat cropping in the Chengdu Plain from 1977 to 2006.

The principal sustainable strategies used for ricewheat cropping systems in Chengdu Plain included 1 creating a favorable environment and viable rotations; 2 balanced fertilization for maintenance of sustainable soil productivity; 3 improvement of crop management for higher efficiency; and 4 use the newest cultivars and cultivation techniques to upgrade the production level. Future research is also discussed in the paper as 1 the constant topic a highly productive and efficient ricewheat cropping system for sustainable growth; 2 the future trend simplified cultivation techniques for the ricewheat cropping system; 3 the foundation basic research for continuous innovation needed for intensive cropping. The objectives of this study are to understand genetic gain for grain yield and associated traits in the Northern China Winter Wheat Region NCWWR. Results showed that average annual genetic gain in grain yield ranged from 32.07 to 72.11 kg ha21yr21 or from 0.48 to 1.23% annually in different provinces. There was no common trend across trials in terms of changes in spikes m22, kernels per spike, 1000kernel weight TKW, or biomass. The genetic improvement in grain yield was primarily attributed to in creased grain weight per spike, reduced plant height, and increased harvest index HI. View fulltext Discover more Download citation What type of file do you want. RIS BibTeX Plain Text What do you want to download. Citation only Citation and abstract Download ResearchGate iOS App Get it from the App Store now. Install Keep up with your stats and more Access scientific knowledge from anywhere or Discover by subject area Recruit researchers Join for free Login Email Tip Most researchers use their institutional email address as their ResearchGate login Password Forgot password. Keep me logged in Log in or Continue with LinkedIn Continue with Google Welcome back. Keep me logged in Log in or Continue with LinkedIn Continue with Google No account. All rights reserved.

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The case study of this research was at an experimental station near Johannesburg where both versions of the model were calibrated and validated by using field data collected from 2004 to 2008. The comparison of EMS and MMS showed considerable difference between the two model versions during extreme drought and heat events. MMS improved grainyield prediction by 30% compared with EMS, demonstrating a better ability to capture the behaviour of stressed crops under a range of conditions. MMS also showed a greater variability in response when both versions were forced with scenarios of projected climate change, with increased severity of drought and increased temperature conditions at the horizons 2030 and 2050, which could drive decreased maize yield. Modelling solutions accounting for the impact of extreme weather events can be seen as a promising tool for supporting agricultural management strategies and policy decisions in South Africa and globally.