

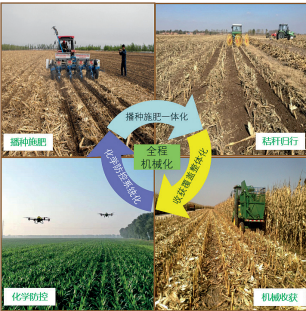
东北玉米保护性耕作 “梨树模式” 研发与应用

成果简介:

团队针对东北黑土退化问题，改革了东北玉米传统耕作方式，研发了具有自主知识产权的玉米免耕播种机，发展了农机-农艺融合技术，创建了现代保护性耕作“梨树模式”。15年的实践证明“梨树模式”具有固土增碳、培肥增效、抗旱保墒、产能提升等作用，为遏制东北黑土地退化、提升土壤功能提供了一整套技术方案。“梨树模式”在东北黑土地得到广泛应用，取得显著经济和社会效益。习近平总书记和胡春华副总理调研“梨树模式”研发基地时，对成果给予充分肯定，习总书记强调：“要认真总结和推广‘梨树模式’，采取有效措施切实把黑土地这个‘耕地中的大熊猫’保护好、利用好，使之永远造福人民”。

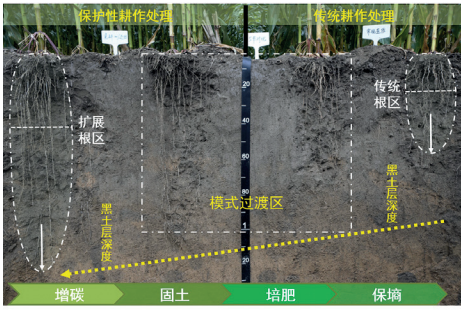
Introduction:

The team reformed the traditional maize farming system and created a modern conservation tillage “Lishu-Mode” in Northeast China by developing a no-tillage planter with independent intellectual property rights and integrating technologies of machinery and agronomy. Fifteen years’ practice has proved that “Lishu-Mode” has positive effects on soil protection, carbon storage, nutrient supply, moisture preservation, and crop productivity. The team innovated a set of techniques for inhibiting soil degradation and improving soil functions in Northeast China. The “Lishu-Mode” has been widely applied in the black soil Land of Northeast China, and achieved significant economic and social benefits. President Xi Jinping and Vice Premier Hu Chunhua investigated the research and development base of “Lishu-Mode” successively and gave full affirmation. President Xi emphasized: “It is necessary to conscientiously summarize and outreach ‘Lishu Mode’, and takes effective measures to protect and use the black soil land – a ‘giant panda of farmland’ sustainably to benefit the people forever”.



“梨树模式”田间作业流程

Field operation chart of “Lishu Mode”



“梨树模式”应用构建厚沃土体，显著提升土壤功能

Soil functions improvements by application of “Lishu Mode”



2020 年 7 月，习近平总书记在梨树调研

President Xi Jinping in Lishu, Jilin province in July 2020



2019 年 7 月，胡春华副总理调研“梨树模式”

Vice Premier Hu Chunhua investigated “Lishu Mode” in July 2019



张旭东研究员在 CCTV-2 “对话” 栏目中介绍“梨树模式”

Professor Zhang Xudong introduced “Lishu Mode” in CCTV-2 “Dialogue”

Development and application of the “Lishu-Mode” of conservation tillage in Northeast China

推荐单位 / Recommended Unit

中国科学院沈阳应用生态研究所
Institute of Applied Ecology, Chinese Academy of Sciences

完成单位 / Accomplished Unit

中国科学院沈阳应用生态研究所
Institute of Applied Ecology, Chinese Academy of Sciences

合作单位 / The Main Cooperation Unit

中国科学院东北地理与农业生态研究所
Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences

社会效益和经济效益:

团队以“黑土地保护与利用科技创新联盟”为支撑，建立了特色推广体系，近三年累计推广应用3000余万亩，取得经济效益约45亿元。“梨树模式”的应用显著提升了土壤功能。十余年的定位研究数据显示，土壤有机质增加11-17%，养分供应能力提高9-25%；土壤每年增加蓄水40-50mm，平均增产3-5%。

团队成果有力支撑了国家黑土地保护战略的实施，推动了国家《东北黑土地保护性耕作行动计划（2020-2025）》的颁布和实施，也为国家重点研发计划黑土专项的制定，以及中国科学院“黑土粮仓”科技会战项目的部署提供了重要依据。

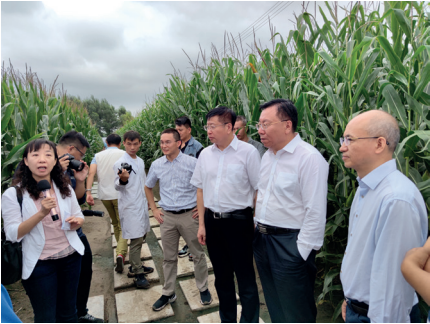
国家和地方媒体广泛报道了“梨树模式”的研发和应用成果，提高了公众对黑土地保护的认知，产生了积极的社会影响。

Social and Economic Benefits:

The team has established a characteristic popularization and application system which was supported by the “Scientific and Technological Innovation Alliance of Conservation Tillage in Black Soil Region”. “Lishu-Mode” of conservation tillage has been applied for more than 30 million mu in the past 3 years. The application of “Lishu-Mode” significantly improved soil functions. Soil organic matter content increased by 11-17% and the nutrient supply capacity by 9-25% in more than 10 years. The soil water storage increased by 40-50 mm and the average yield increased by 3-5% yearly. The total economic benefit was about 4.5 billion yuan.

The team made a great contribution to the national black soil protection formulation and promoted the promulgation and implementation of the national “Action Plan for Conservation Tillage in Northeast Black Soil Land (2020-2025)”. Development of “Lishu Mode” also provided an important basis for the formulation of the National Key R&D Program of China—Specific Project of “Black Soil Land”, and for the deployment of the “Science and Technology Battle of Black Soil Granary” project of Chinese Academy of Sciences.

The national and local media have widely reported the development and application of the “Lishu Model”, which has made a positive social impact.



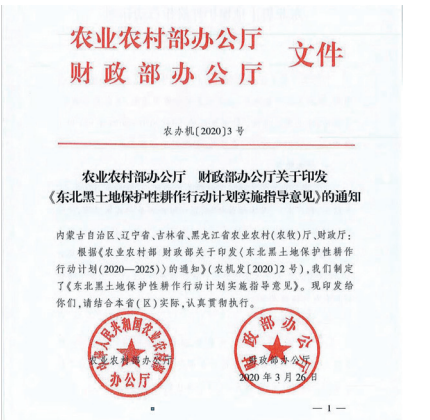
2020 年 8 月，中国科学院副院长张亚平在梨树研发基地调研和指导工作

In August 2020, Zhang Yaping, vice President of Chinese Academy of Sciences, visited Lishu R&D site



2021 年 8 月，中国科学院副院长张涛在梨树研发基地调研和指导工作

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国家《东北黑土地保护性耕作行动计划(2020-2025)》发布

Promulgation of National Action Plan for the Application of Conservation Tillage in Northeast Black Soil Land of China (2020-2025)

团队成员 / Team Members:



张旭东
Zhang Xudong

中国科学院沈阳应用生态研究所
主要贡献：团队负责人，制定研发框架，组织关键技术和模式研发，构建示范应用体系。

Institute of Applied Ecology, Chinese Academy of Sciences
Main contributions: Team leader, developing research and development framework, organizing technologies innovation, and building a demonstration system.



关义新
Guan Yixin

中国科学院东北地理与农业生态研究所
主要贡献：免耕播种机研发与应用，农机-农艺融合模式研发。

Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences
Main contributions: Research and application of no-tillage planter, development of machinery and agronomy integration mode.



解宏图
Xie Hongtu

中国科学院沈阳应用生态研究所
主要贡献：农机-农艺融合模式研发，长期定位试验管理，示范应用。

Institute of Applied Ecology, Chinese Academy of Sciences
Main contributions: Development of agricultural machinery and agronomy integration mode, long-term experiment management, demonstration and application.



何红波
He Hongbo

中国科学院沈阳应用生态研究所
主要贡献：农艺模式建立，长期定位研究，土壤功能评价。

Institute of Applied Ecology, Chinese Academy of Sciences
Main contributions: Agronomic model establishment, long-term experimental investigation, soil functions evaluation.



王贵满
Wang Guiman

吉林省梨树县农业技术推广总站
主要贡献：协调政府部门，梨树基地管理，示范应用。

Extension Station for Agricultural Technology, Lishu county, Jilin province
Main contributions: Coordination work of government departments, experimental management, application and demonstration of “Lishu” base.



董文赫
Dong Wenhe

吉林省梨树县农业技术推广总站
主要贡献：农机-农艺融合模式示范推广，联盟工作。

Extension Station for Agricultural Technology, Lishu county, Jilin province
Main contributions: Demonstration and popularization, alliance management work.



杨 宏
Yang Hong

辽宁省现代农业生产基地建设工程中心
主要贡献：协调政府部门，保护性耕作模式研究，示范应用。

Engineering Center for Modern Agricultural Production Base Construction of Liaoning Province
Main contributions: Coordination work of government departments, research, demonstration and application of conservation tillage model.



刘 华
Liu Hua

辽宁省现代农业生产基地建设工程中心
主要贡献：农机 – 农艺融合模式应用，示范基地管理。

Engineering Center for Modern Agricultural Production Base Construction of Liaoning Province
Main contributions: Application of agricultural machinery and agronomy integration mode, demonstration sites management.



张 军
Zhang Jun

辽宁省昌图县现代农业发展服务中心
主要贡献：示范基地管理，模式评价，生产评价。

Service Center for Modern Agriculture Development, Changtu county, Liaoning province
Main contributions: Demonstration sites management, mode of and production evaluation.



刘智卓
Liu Zhizhuo

辽宁省现代农业生产基地建设工程中心
主要贡献：示范基地管理，模式评价。

Engineering Center for Modern Agricultural Production Base Construction of Liaoning Province
Main contributions: Demonstration sites management, production evaluation.