

宁夏保护性耕作技术实践与发展探讨

An Approach on the Practice and Development of
Conservation Tillage in Ningxia Hui Autonomous Region

宁夏农业机械化技术推广站 王洪兴 万平

Agricultural Mechanization Extension Station of Ningxia, China

Wang Hongxing Wan Ping

提纲 (Outline)

- 1 基本情况;
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 - 3 示范推广保护性耕作技术的主要措施;
 - 4 保护性耕作技术可持续发展的思考。
- 1 Basic information
 - 2 The conservation tillage(CT) models in different agricultural area
 - 3 The main measures taken in Ningxia
 - 4 Thinking on the sustainable development on the conservation tillage technology in Ningxia

1 基本情况(1)

1 Basic information(1)

• 1.1 农业基本情况

- 宁夏位于中国西北部，是全国五个少数民族自治区之一，国土面积6.64万km²，人口603万，全区由南向北分引黄灌区、中部干旱带和南部山区三个生态区域。共辖五个地级市22个县（市、区），耕地面积110万hm²，草原面积233万hm²。

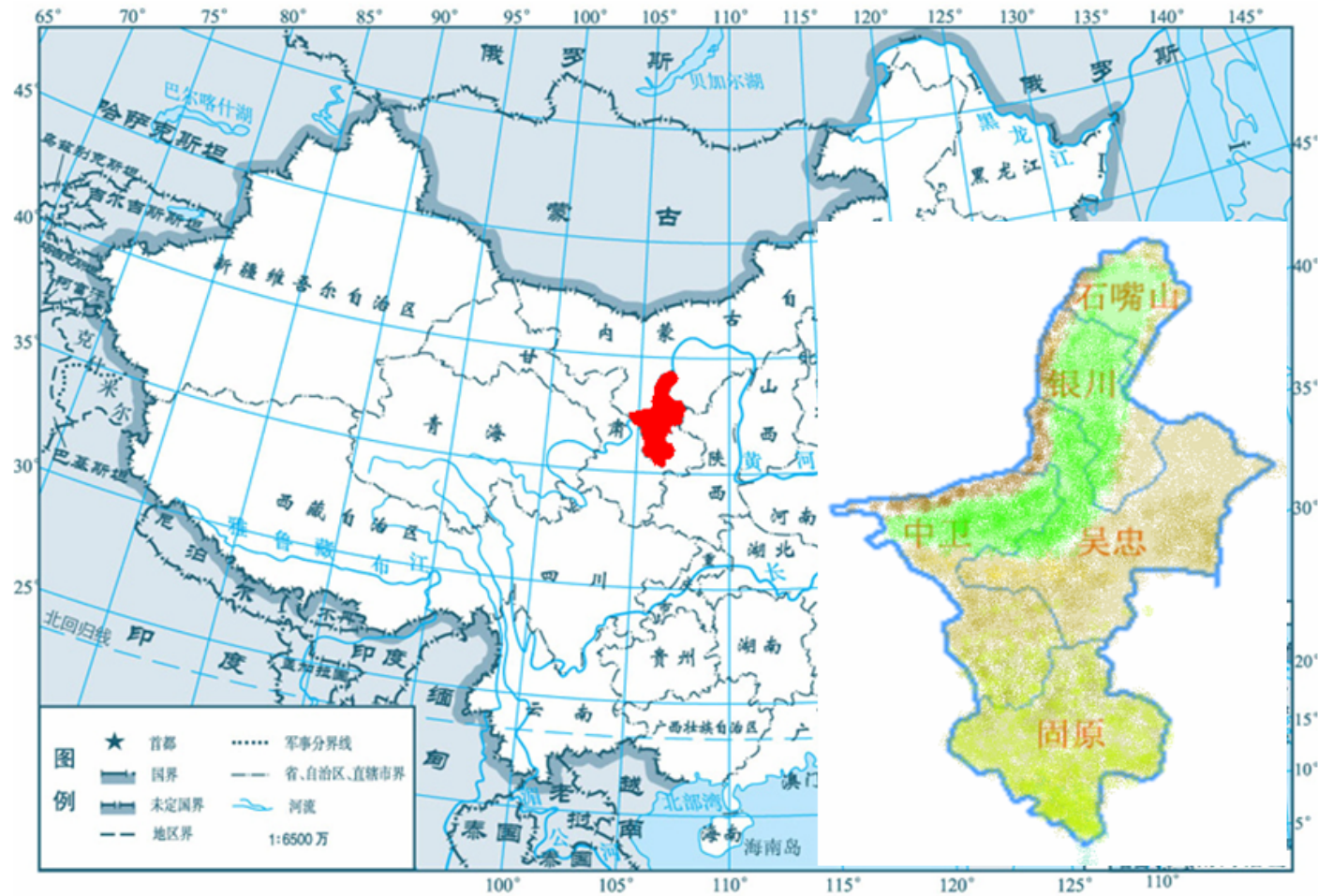
• 1.1 Basic information of agriculture

- Ningxia is located in the north-west of China, which is one of the five minority nationality regions in China. There are 22 counties with a population of 6.03 million. The total land area is 66.4 thousands km², of which the cultivated land is 1.1 million hm² and the grassland area is 2.33 million hm². It is divided into three different kinds of ecological blocks named southern mountainous area, arid area in the middle and the Yellow River irrigated area from the South to the north.

1 基本情况 (2)

1 Basic information(2)

宁夏位于祖国西北东部



1 基本情况 (3) Basic information

宁南山区

- 沟壑黄土丘陵，土地贫瘠，生态脆弱，年降雨量400-500mm左右，粮食产量低而不稳。国家对这一地区发展生态农业非常重视，近年山坡地实行退耕还草和修建梯田。主要农作物小麦、玉米、马铃薯、牧草。



1 基本情况(4) Basic information

中部干旱带

- 南接黄土高原，东西沙漠，北部引黄灌区。多为黄土地、草原、戈壁，年降雨量200-300mm，除扬黄灌区外不宜农作。近年围栏禁牧种草植树，恢复生态。主要作物小麦玉米马铃薯西瓜。



1 基本情况 (5) Basic information

引黄灌区

素有“塞上江南”之称，自流排灌工程设施完善，粮食亩产上吨，主要农作物小麦、水稻、玉米。



1 基本情况 (6)

1 Basic information (6)

- 1.2 保护性耕作实施情况
- 2003年起试验示范保护性耕作技术，目前累计有6个农业部示范县、9个自治区试验示范县。涉及五个市，累计实施面积7万hm²，2007年实施面积3万hm²。
- **1.2 Information of CT**
- CT trials and demonstration were started since 2003 in Ningxia. Up to now, it's been implemented in 70 thousands hm² accumulatively, and 30 thousands hm² in 2007.



2 不同类型农业区域保护性耕作技术实践 (1)

2 The conservation tillage models in different agricultural area (1)

- 2.1 引黄灌区节本效果明显，但存在适应性问题
- 该区域是宁夏农业的精华地带，采用保护性耕作主要是减少沙尘暴、培肥地力，节水，节本。主要试验了春小麦和春玉米一年一作免（少）耕种植，冬小麦+夏玉米/豆类和春小麦+夏玉米/豆类一年两作免（少）种植四种模式。确定成熟模式为：春玉米免耕种植（四省一增，增产5%），冬小麦带状免耕种植（增产5%-10%），小麦收获后免耕复种夏玉米和豆类（抢农时、增加种植面积、增产10%-20%）。免（少）耕不适合用于春小麦。
- **2.1 It has achieved remarkable cost saving result in the Yellow river irrigated area, but it's still not so suitable.**
- There are three significance to implement the conservation tillage skill in this area: Preventing the dust storm and improving the land, saving water and reducing the machines working times.
- Four models of CT have been trialed and demonstrated in this area, which are spring-wheat, spring-maize seeding with no-till (less-till), spring-wheat and summer-maize/beans, winter-wheat and summer-maize/beans seeding with no-till (less-till).
- The suitable models are: spring-maize seeding with no-till (less-till), winter-wheat seeding with no-till (less-till), summer-maize or beans seeding with no-till (less-till) after harvesting wheat.

2 不同类型农业区域保护性耕作技术实践 (2)

2 The conservation tillage models in different agricultural area (2)



稻茬田免耕种植冬小麦

旱茬田免耕种植冬小麦

2 不同类型农业区域保护性耕作技术实践 (3)

2 The conservation tillage models in different agricultural area (3)



小麦收获后免耕复种夏玉米



小麦收获后免耕复种黄豆



2 不同类型农业区域保护性耕作技术实践 (4)

2 The conservation tillage models in different agricultural area (4)



免耕种植春玉米



免耕种植春小麦



2 不同类型农业区域保护性耕作技术实践 (5)

2 The conservation tillage models in different agricultural area (5)

- 2.2 中部干旱带实施保护性耕作技术有利于改善生态环境，补灌条件下种植粮食效益显著
- 该区域是半农半牧区，特点是降水少蒸发量大，采用保护性耕作主要意义是改善生态环境。开展了旱作区春玉米免耕种植、补灌区春玉米免耕种植和雨后抢墒免耕补播牧草试验。确定的成熟模式是：补灌区春玉米免耕种植（增产5%-10%）和雨后抢墒免耕补播牧草（牧草覆盖率由30%提高到68%，产草量由675kg/hm²增加到2250kg/hm²，2007年推广1.7万hm²。
- **2.2 To implement the conservation tillage in Middle arid area will be good and helpful to improve its ecological environment. Crop production would benefit on the condition of supplementary irrigation.**
- The annual precipitation is very low, while the annual evaporation is very high in this area.
- The trials of planting spring-maize seeding with no-till (less-till), spring-maize seeding with no-till (less-till) with supplementary irrigation and grass seeding with no-till (less-till) after raining were undertaken in this area.
- The defined suitable models are spring-maize seeding with no-till (less-till) in additional water irrigated area and grass seeding with no-till (less-till) after raining.
- Rates of grass covering was increased to 68% from 30% and the grass production was increased to 2250 kg/hm² from 675kg/hm² after CT.
- Grass seeding with no-till (less-till) after raining have been used for 17 thousands hm² only in 2007 .

2 不同类型农业区域保护性耕作技术实践 (6)

2 The conservation tillage models in different agricultural area (6)



- 雨后抢墒免耕补播牧草

2 不同类型农业区域保护性耕作技术实践 (7)

2 The conservation tillage models in different agricultural area (7)

- 2.3 南部山区保护性耕作节本增产优势明显，受到示范区农民的普遍欢迎
- 该区域属半干旱黄土丘陵区，其特点是粮食产量低，农业基础条件差，生态环境脆弱。主要开展了冬小麦带状免耕施肥播种试验和示范，增产幅度达10%-30%，干旱年份抗旱优势明显。该区域采用保护性耕作技术种植冬小麦前景良好。
- **2.3 The yield increasing is obvious in southern mountainous area, and is popularized in this area.**
- This area is semi-arid loess hilly land area. The ecological environment is rather fragile, the agricultural development foundation is very poor, and the farmers' income is very low.
- The crop yield of seedbed tripe rotation seeding may increase from 10% to 30%.
- Winter-wheat planting with CT will have bright prospects in this area.

2 不同类型农业区域保护性耕作技术实践 (8)

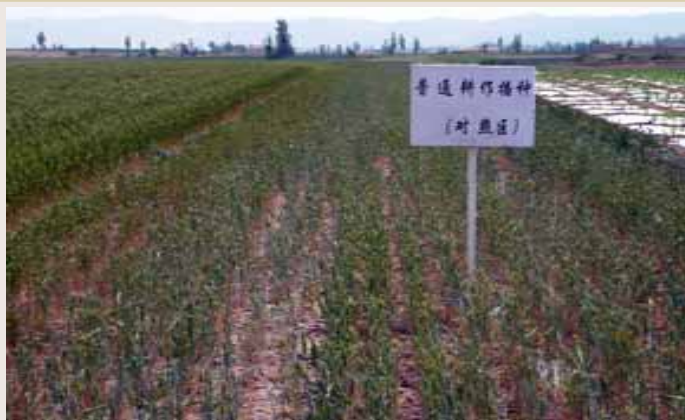
2 The conservation tillage models in different agricultural area (8)



- 2007年上半年,南部山区遭受50年不遇的干旱,干土层厚度超过80厘米,传统耕作种植冬小麦几乎绝产,保护性耕作种植的冬小麦显示了较强的抗旱能力。

2 不同类型农业区域保护性耕作技术实践 (9)

2 The conservation tillage models in different agricultural area (9)



- 传统种植冬小麦长势



膜侧种植冬小麦长势



保护性耕作带状免耕种植冬小麦长势

3 宁夏示范推广保护性耕作的主要措施 (1)

3 The main measures taken in Ningxia (1)

- 3.1 树立农民是保护性耕作技术实施主体的意识
- 坚持农民的主体地位，以改善生态环境为目标，以粮食增产、农民增收为前提，从农民能够接受、可持续发展的角度选择基础好的示范点，并确保技术到位，确保节本增产示范效果显现。
- **3.1 Develop an opinion that the farmers are the main bodies of the conservation tillage technology**
- Technicians must understand this point well and regarded the farmers as the main body during the implementation of the conservation tillage technology. We selected the demonstration plots and carried out the project trials for achieving the purposes of the ecological environment improvement, the yields promotion and farmers' income increasing, and the sustainable agricultural development .

3 宁夏示范推广保护性耕作的主要措施 (2)

3 The main measures taken in Ningxia (2)

- 3.2 坚持因地制宜的原则，不生搬硬套，成熟一项推广一项。
- 我们始终坚持因地制宜的原则，结合三大生态区域的特点，在多点试验成熟的基础上，推广保护性耕作技术。同时，加大成熟单项技术的推广力度。如雨后抢墒免耕补播牧草面积累计3.5万公顷，小麦收获后免耕复种夏玉米和黄豆广泛被农民采用，机械化深松成为部分项目县政府下达的硬性任务指标。
- **3.2 Stress on the principal of doing things in the light of the local condition, extend only when it could be extended.**
- We stressed on doing each thing in the light of the local condition. After many trials, we have selected different models for three kinds of ecological blocks and extended them.
- We also extend the technology of CT separately. Such as: grass seeding with no-till (less-till) after raining, summer-maize and beans seeding with no-till (less-till) after wheat harvesting, subsoiling.

3 宁夏示范推广保护性耕作的主要措施 (3)

3 The main measures taken in Ningxia (3)



- 在部级保护性耕作项目带动下
- 平罗县机深松面积达2万余 hm^2

3 宁夏示范推广保护性耕作的主要措施 (4)

3 The main measures taken in Ningxia (4)

3.3 示范区采取竞争方式产生，在机制上保证项目实施效果。

我们在实施自治区级保护性耕作试验示范项目县中通过竞争评选的方式产生部级保护性耕作项目县。

项目实施单位与项目区乡镇、村队签订目标责任书，调动了各级部门的工作积极性。与技术人员签订责任书，将项目任务和工作质量与工资、职称评定等挂钩，提高了技术人员的主观能动性。

- **3.3 In order to guarantee the effect of project implementation, the demonstration areas were selected by a way of competition.**
- The national project counties of technology of CT were selected from Ningxia regional CT project counties according to the examination scores given by the the examination committee.
- Contracts between project implementing county level unit, project implementing town level and project implementing village level were signed, project implementing county level unit and technical staffs are signed. At the result for that, every manager and working staff do their best for the project of technology of conservation tillage.

3 宁夏示范推广保护性耕作的主要措施 (5)

3 The main measures taken in Ningxia (5)



部级保护性耕作项目县与项目区乡镇和技术人员签订目标管理责任书

3 宁夏示范推广保护性耕作的主要措施 (6)

3 The main measures taken in Ningxia (6)

- 3.4 用好农机购置补贴政策，注重发挥农机大户的示范作用。
 - 将保护性耕作机具作为农机购置补贴的重点，扶持农民和农机服务组织购买，确保保护性耕作机具保有量。
 - 组织农机大户开展保护性耕作作业服务，使购机农户和种植农户“双赢”，促进保护性耕作持续健康发展。
- **3.4 Using the allowance policy of agricultural machinery purchasing, elaborating the demonstration action of agricultural machinery farmers.**
 - We encouraged farmers to purchase agricultural machineries for technology of conservation by using allowance policy of agricultural machinery purchasing so that Ningxia has enough machines for CT
 - Organizing agricultural machinery farmers to develop CT working service in order that both agricultural machinery farmers and crop planting farmers can get more benefit at same time.

4 宁夏保护性耕作技术持续发展的思考(1)

4 Thinking toward the sustainable development on CT in Ningxia(1)

- 4.1 科学制定宁夏保护性耕作发展规划，稳步推动保护性耕作发展。
- 结合区情，尽快制定科学可行的保护性耕作发展规划，通过规划合理布局、科学引导、广泛宣传，争取各方对保护性耕作技术推广工作的支持，有步骤地推动本区保护性耕作又快又好地发展。
- **4 . 1 Make out scientific development program, steadily push the conservation tillage technology moving forward in Ningxia.**
- Ningxia shall make out a scientific practical development program for the local conservation tillage technological extension. Try to have a strong support from all aspects by making a rational planning, fine instruction and wide medial propagation. Let the conservation tillage extension going forward quickly and smoothly in Ningxia.

4 宁夏保护性耕作技术持续发展的思考(2)

4 Thinking toward the sustainable development on CT in Ningxia(2)

- 4.2 顺应形势发展，不断扩展保护性耕作技术内涵，指导不同区域有重点地示范推广。
- 把保护性耕作的功能和机理拓展到整个种植业（包括粮食作物、经济作物和饲草）以及大农业，赋予其既保护生态环境，又保护农民利益、增加干部政绩的多重功能，让大家都能随得上、用得着，从而使保护性耕作技术发挥更大的作用，促进保护性耕作技术普及应用。
- 4.2 In line with the development trends, enlarge the content of the conservation tillage technology, and extend it in different area.
- Enlarging the function and concepts of technology of conservation tillage into the whole planting industry, including the grain crops, economic crops and forage planting. It can not only protect the environment, but also improve the farmers income.

4 宁夏保护性耕作技术持续发展的思考(3)

4 Thinking toward the sustainable development on CT in Ningxia(3)

- 4.3 坚持因地制宜，有所为、有所不为的原则。
 - 引黄灌区重点推广冬小麦带状免耕种植、玉米免耕种植和小麦收获后免耕复种夏玉米、豆类技术。
 - 中部干旱带重点推广补灌区玉米免耕种植和草原雨后抢墒免耕补播牧草技术。
 - 南部山区重点推广冬小麦带状免耕施肥播种技术，并示范牧草、玉米、小杂粮保护性耕作技术。
- **4.3 Stress on making a decision in the light of the local condition and doing some not doing all**
 - **For the Yellow river irrigated area:** Extending winter-wheat planting with seedbed tripe rotation seeding, summer-maize or beans seeding with CT after harvesting wheat and spring-maize seeding with CT.
 - **For the middle arid Area:** Extending Grass seeding with no-till after raining and spring-maize seeding with no-till in additional water irrigated area.
 - **For the southern mountain area:** Extending winter-wheat with seedbed tripe rotation seeding. Meanwhile, technology of CT should be used for grass, buckwheat and beans in order to enlarge the effect of technology of conservation tillage.

4 宁夏保护性耕作技术持续发展的思考(4)

4 Thinking on the sustainable development on CT in Ningxia(4)



- 宁夏引黄灌区采用带状免耕技术种植的冬小麦长势喜人，增产幅度最高达10%。

4 宁夏保护性耕作技术持续发展的思考(5)

4 Thinking on the sustainable development on CT in Ningxia(5)

- 4.4 注重保护性耕作单项技术的应用，促进农业发展。
- 在暂时没有条件示范推广保护性耕作整体技术的地区，应积极鼓励和支持其示范推广保护性耕作的机械化深松、免（少）耕播种等单项技术，以发挥其资源的应有作用。
- **4.4 Focus on the utilization of single technology of conservation tillage in order to develop local agriculture.**
- We may encourage and support to demonstrate technology of CT separately if the area has no condition to extend the whole technology of CT. Subsoiling and summer-maize/beans seeding with no-till(less-till) are good technology for three different kinds of ecological blocks.

4 宁夏保护性耕作技术持续发展的思考(6)

4 Thinking on the sustainable development on CT in Ningxia(6)

- 4.5 充分利用购机补贴政策壮大保护性耕作机械化服务实力，加强组织协调提高机具利用率。
- 利用农机购置补贴政策，引导扶持农民、农机服务组织等购买保护性耕作机具。同时，各级农机管理和推广部门应牵头组织保护性耕作作业协会、保护性耕作作业服务队等服务组织，并为其提供跨区作业的信息服务和便利条件，以增加保护性耕作机具购买者的作业收入，促进保护性耕作的良性发展。
- **4.5 Increasing the quantities of agricultural machinery for technology of conservation tillage by using the allowance policy of agricultural machinery purchasing, increasing the rates of machinery's utilization.**
- The government should support farmers and service origination of agricultural machinery to purchase machineries for CT by allowance policy. The managing and extending organizations should also supply information about machinery's working from county to county for the farmers so that the farmers can get more service income.

不妥之处，请领导、专家批评指正

热忱欢迎各位领导和专家赴宁指导工作
谢谢！

Welcome to Ningxia!