

Challenges for rice production technology Transfer and Adoption

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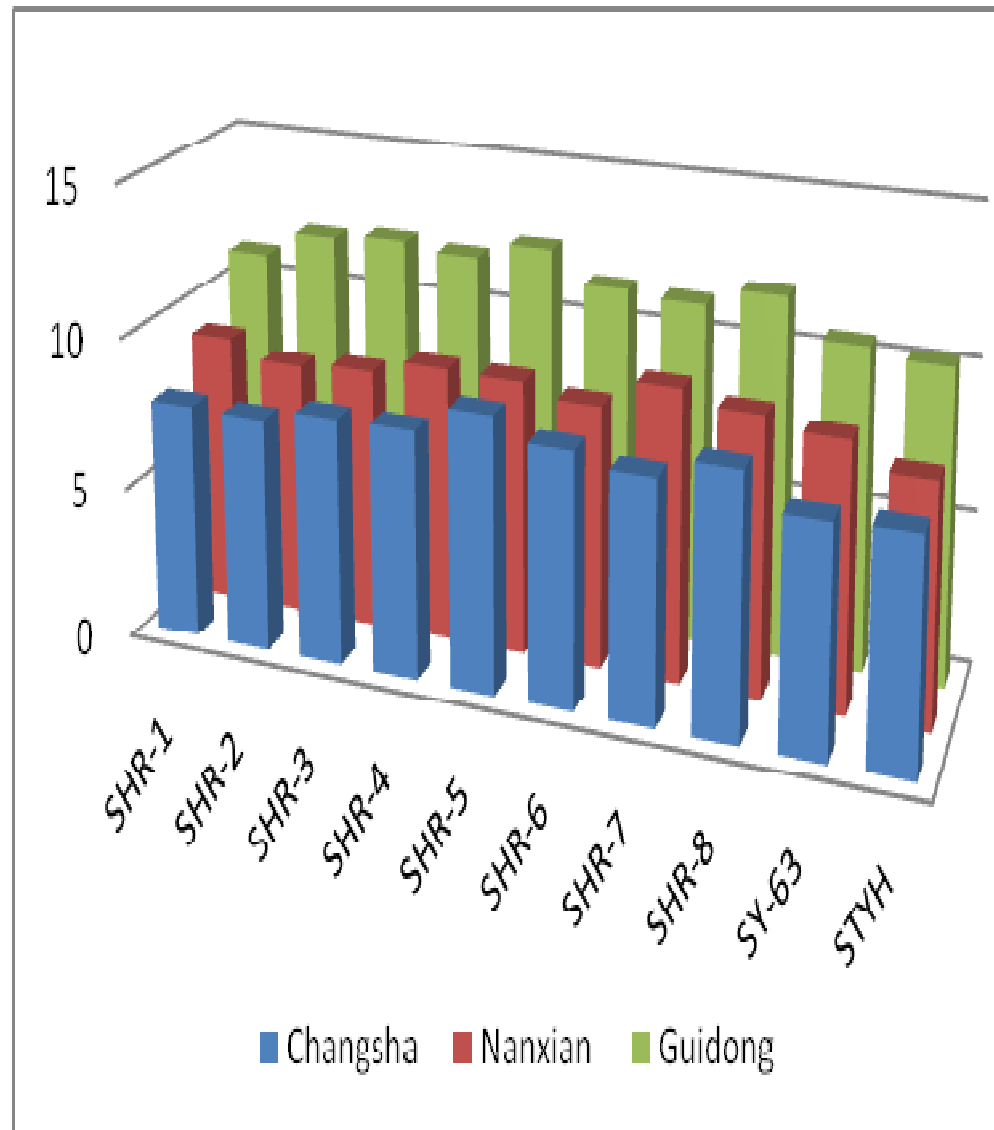
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1. High yielding expectation by growing hybrid rice



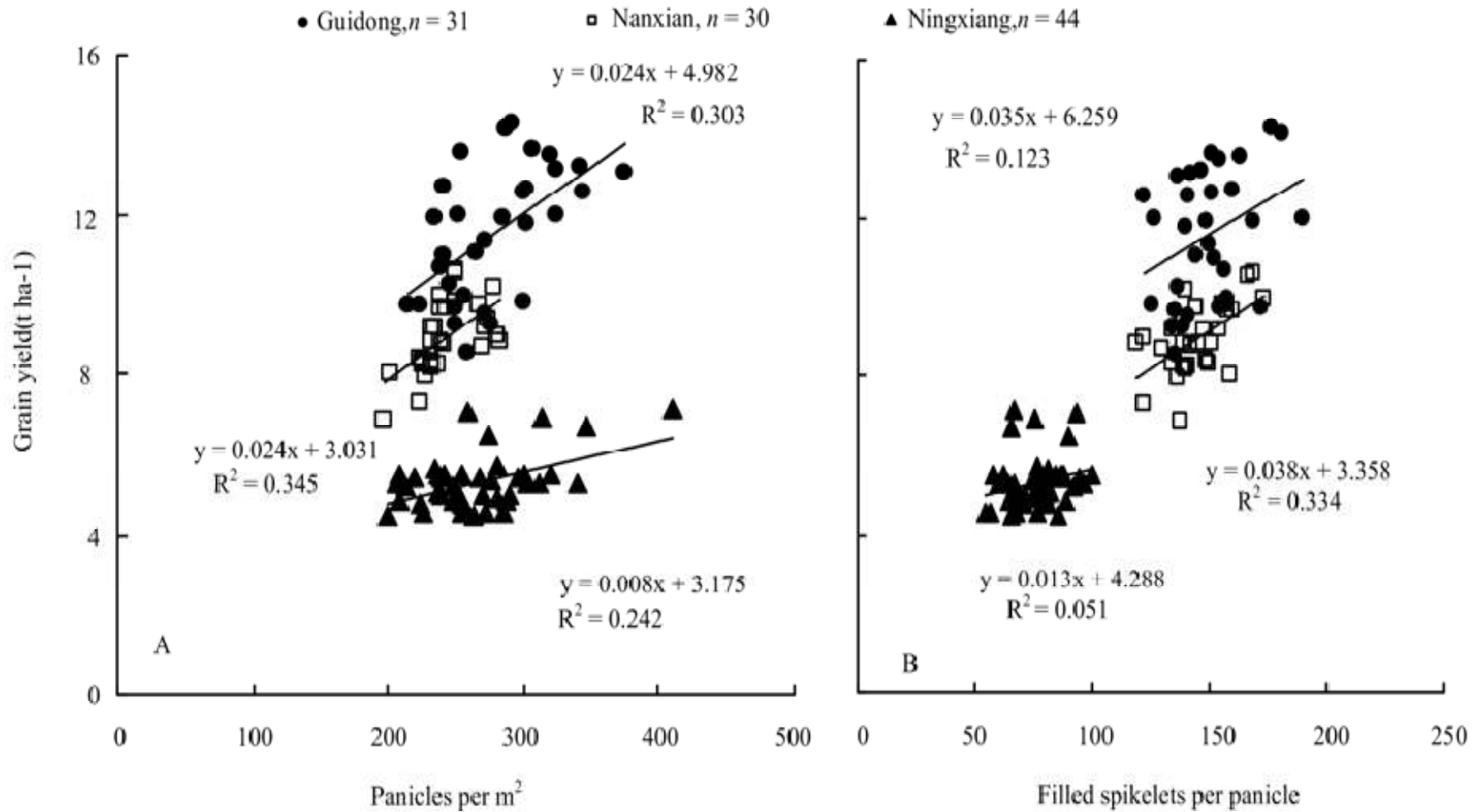
Yield performance
of super hybrid rice
(data average in
2007-2009)

Average yield of super
hybrid rice increased by
13.4% and by 9.5%
compared with inbred
rice (STYH) and
common hybrid rice
(SY-63)



Contribution of yield components to hybrid rice grain yield

Hybrid rice	Factor	Direct path coefficient	IDPC (x_i, x_1)	IDPC (x_i, x_2)	IDPC (x_i, x_3)	IDPC (x_i, x_4)
ZLY-527 (2004-2005)	x_1	1.186	-	-0.577	0.142	0.143
	x_2	0.641	-1.067	-	-0.151	-0.201
	x_3	0.176	0.961	-0.552	-	0.147
	x_4	0.410	0.413	-0.313	0.063	-
10 cultivars (2007-2009)	x_1	0.700	-	-0.128	0.062	-0.073
	x_2	0.506	-0.177	-	-0.056	-0.281
	x_3	0.451	0.097	-0.063	-	-0.040
	x_4	0.505	-0.102	-0.281	-0.036	-



Relationship between grain yield and its components

(Data from farmers field investigation in 2009)

Nutrient need to produce 1000 kg grain yield

Nutrient	Hybrid rice		Inbred rice		Inbred rice	
	Early season	Late season	Early season	Late season	Optimum	Surplus
N	18.6	18.1	17.9	17.8	14-16	17-23
P	3.4	3.2	3.5	3.4	2.4-2.8	2.9-4.8
K	19.7	22.3	17.7	18.2	14-16	17-27
Data source	Zou, 2001		Zou, 2003		IRRI, 2000	

2. Extension method of China Hybrid Rice



Enhancing organization and leadership of hybrid rice research

- Hybrid rice development is formally on the agenda of local governments at all levels and agriculture departments.
- Ensure the needs of scientific research and seed production regarding financial help, material and personnel.
- Set up a hybrid rice team, a timely coordination of scientific research, production and dissemination, and other related aspects.
- Develop policy on hybrid rice, regarding three priorities: expansion of single hybrid rice, development of late hybrid rice, breakthrough early hybrid rice.

Organizing the national and provisional cooperation research on hybrid rice

- Organize the genetic resource exchange and cross-sector research consortium for high quality male sterile line and restorer line, and breeding for new combination, improvement of growth period, grain quality and disease resistance.
- Organize the multi-disciplinary and trans-regional coordination for technical research of seed production and high-yielding cultivation.
- Establish a national hybrid rice expert advisory group for the promotion of the seed production and the scientific research.

Upholding the principle from field experiment and demonstration to rice production application

- Introduce high-yielding cultivation techniques and new hybrid rice combination, organize field demonstration in different locations, and evaluate the production adaptability.
- Set up a 100 mu or 1000 mu demonstration sample of high-yielding cultivation of hybrid rice, establish high-yielding demonstration, promote point to no point, speed up the promotion of hybrid rice production.

Encouraging farmers to join the field production experiment

- Organize farmers participation in hybrid rice production model, establish high-yield cultivation model, organize a field visit and productive evaluation for the farmers.
- Develop training on seed production technique, cultivation techniques, and new varieties selection transfer for farmers.
- Recommend high-yielding cultivation technique of new varieties to farmers, and provide with technical information.

3. Features of extension application of hybrid rice in China



Objective of the extension service based on individual farmer's family

- Farmers' planting size is about 0.3~0.5 hectares, while some individual growers can reach 20 hectares.
- Dispersion planting increases difficulty for technical extension services and increases the **service objects** and organization unit as well.
- The farmers education level will be increased:generally they will reach middle school and become high school graduates, receiving technical capacity.



Extension method based on 3- incorporation: production, education and research units

- Strengthen the construction of a county agricultural technology extension system, support rural professional technique associations and other non-governmental professional service organizations.
- Agricultural technology promotion is enhanced by the government sector, institutions, scientific research and teaching unit, agricultural services, professional service companies, professional associations, and other non-governmental organizations.
- Field demonstration schools will become important places of farmers to learn about new technologies. Fixed demonstration supplies new technology model directly to farmers.



Extension approach based on supporting modern equipment

- Consulting services of telephone or computer. When farmers have problems regarding the rice they can directly use the phone or computer network to consult the relevant technical departments.
- Government departments will also set up a special telephone hotline. Liaoning, Shandong, Hunan and other provinces have set the "farm hotline" to solve technical problems.
- Training publicity of audio-visuals to promote training widely in a lot of regions: CDs will gain popularity, agriculture television will become an important channel for farmers to learn about technology.



4. Current transfer of rice production technology



Transformation of rice production in China

- Chemical fertilizer instead of organic fertilizer
- Simple and labor saving production instead of intensive farming
- Mechanization instead of manual labor



Production cost compared to inbred rice

- Seed cost?
- Seed rate: smaller rate (15~22.5 kg/ha)
- Seed price: higher price (40~80 Yuan/kg)

- Nitrogen cost?
- Nitrogen need: no difference
- Nitrogen application: higher rate in the early stage
- Nitrogen tolerance: weak sensitive

Ecological adaptation compared to inbred rice

- Soil factors?

Fertility: fertile soils

Drought: more tolerance

Salt tolerance: not clear

- Climatic factors?

Hot tolerance: more sensitive

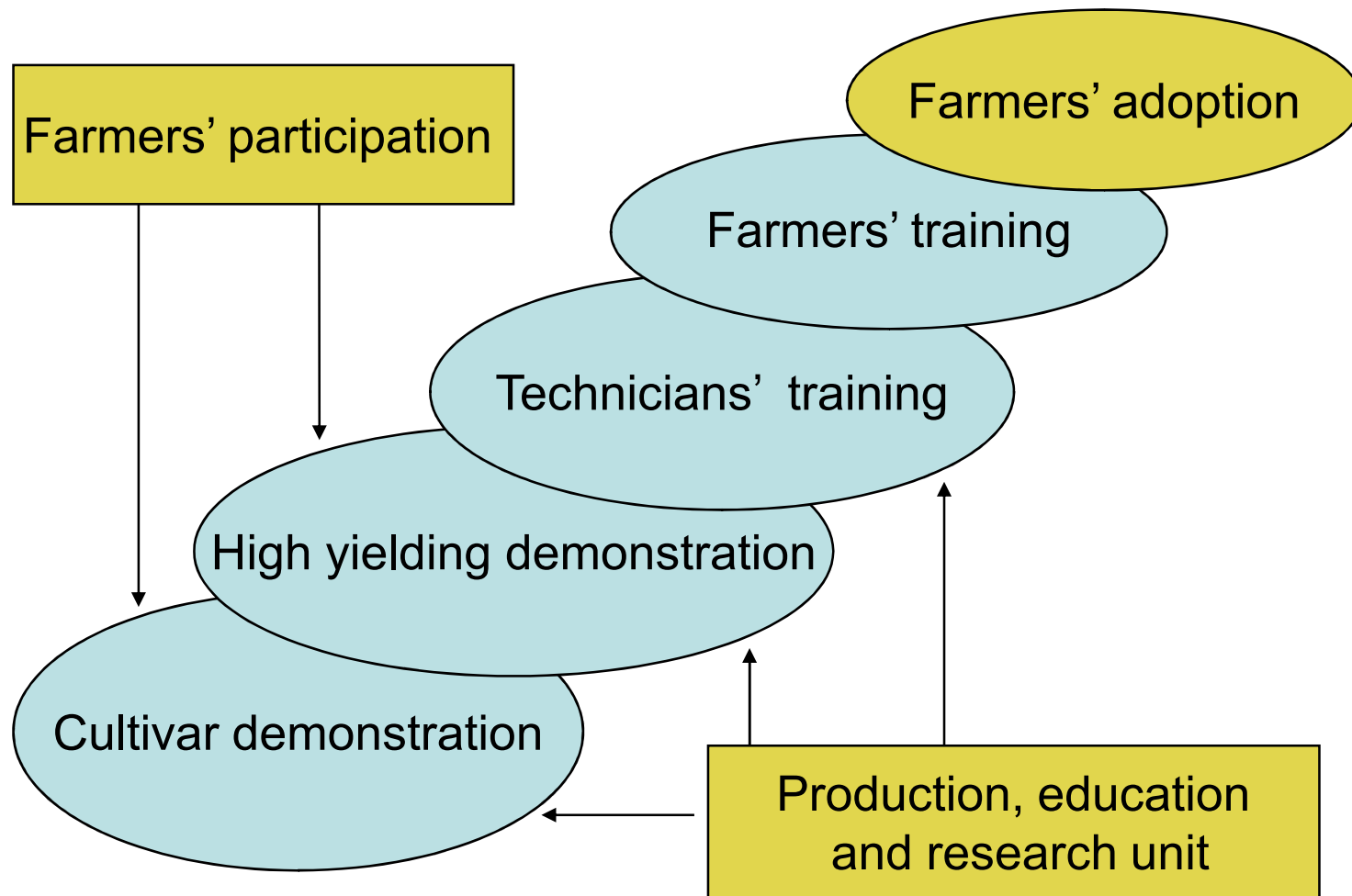
Cold tolerance: more sensitive

Solar radiation: not clear

Humidity: not clear

Lodging (by wind): more tolerance

Adoption process of hybrid rice



A wide-angle photograph of a lush green rice field. The rice plants are in the foreground, showing their characteristic long, narrow leaves and developing panicles. The field extends to the horizon, where a small cluster of buildings and utility poles are visible under a clear, light blue sky. The overall scene is peaceful and rural.

Thank you for your attention!