



Arroz más austral del mundo: Japonés de alta calidad y sustentabilidad

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El arroz en Chile



- Arroz **más austral** del mundo (latitud 36)
- **No** presencia de **plagas ni enfermedades** por el frío
- 100% arroz **japonico temperado**
- Granos largos anchos translúcidos
- Bajo consumo por persona 11 Kg/año
- Entre 50% y **70%** de arroz se **importa** (indica)
- Rendimiento promedio 6.5 t/ha
- 80% **pequeños productores** (~20 has)



Arroz japonico en el mundo

15% del arroz del mundo (71 Mt)



Otros actores relevantes: Egipto, Tailandia, Malasia, Italia, Australia.

- Mayor **exportador**: Estados Unidos (California)
- Mayores **productores y consumidores**
- China (produce 51Mt y consume 47 Mt)
- Japón (produce 7.5 Mt y a la vez mayor importador)
- Corea del Sur (tercer mayor productor, consumidor e importador)



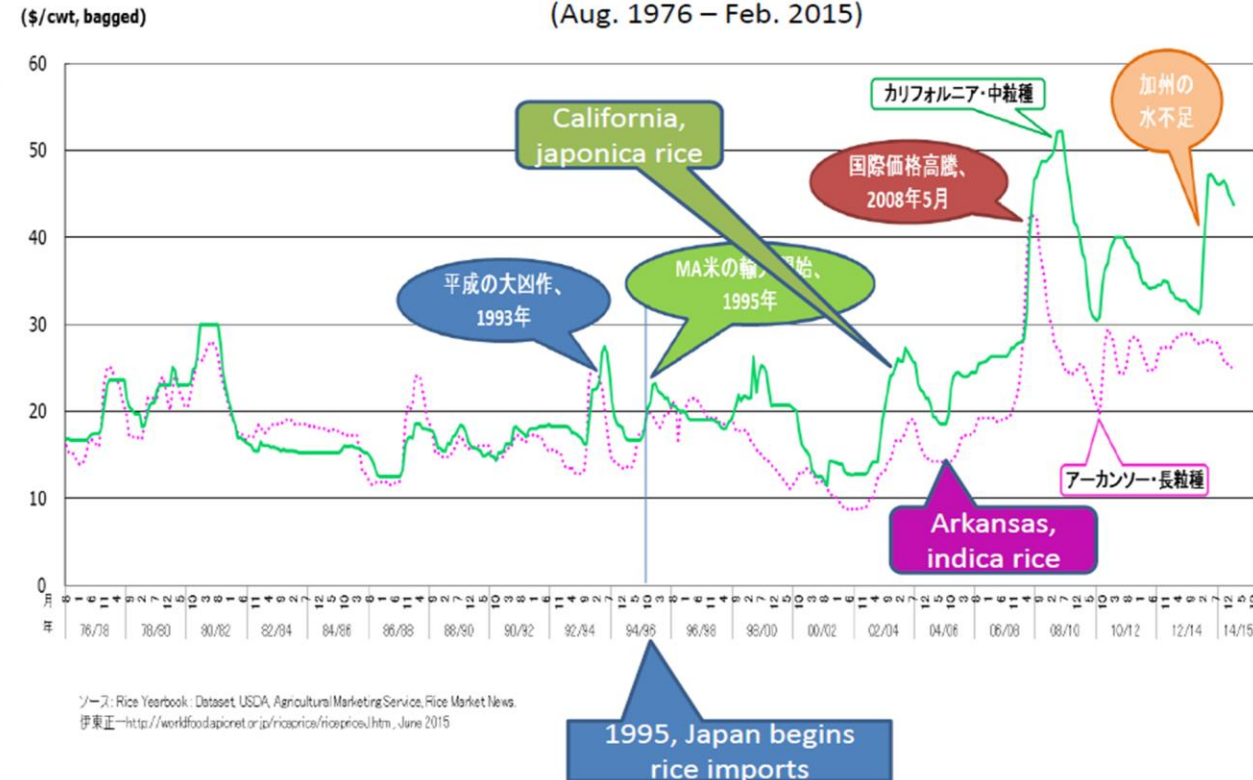
Mercado y precio arroz japonico en el mundo

Growing number of Japanese restaurants in the world, by region, 2017

	Asia	Russia	EU	North America	Latin America	Middle East	Africa	Oceania	World Total
2006	10,000	1,000	2,500	14,000	1,500	100	50	1000	30,150
2013	27,000	1,200	5,500	17,000	2,900	250	150	700	54,700
2015	45,300	1,850	10,550	25,100	3,100	600	300	1,850	88,650
2017	69,300	2,400	12,200	25,300	4,600	950	350	2,400	117,500
Increasing rate 2017/2015	153%	130%	116%	101%	148%	158%	117%	130%	133%

Source: Ministry of Agriculture, Forestry and Fisheries, August 2017

Price differences of japonica and indica rice in the U.S., FOB prices (Aug. 1976 – Feb. 2015)

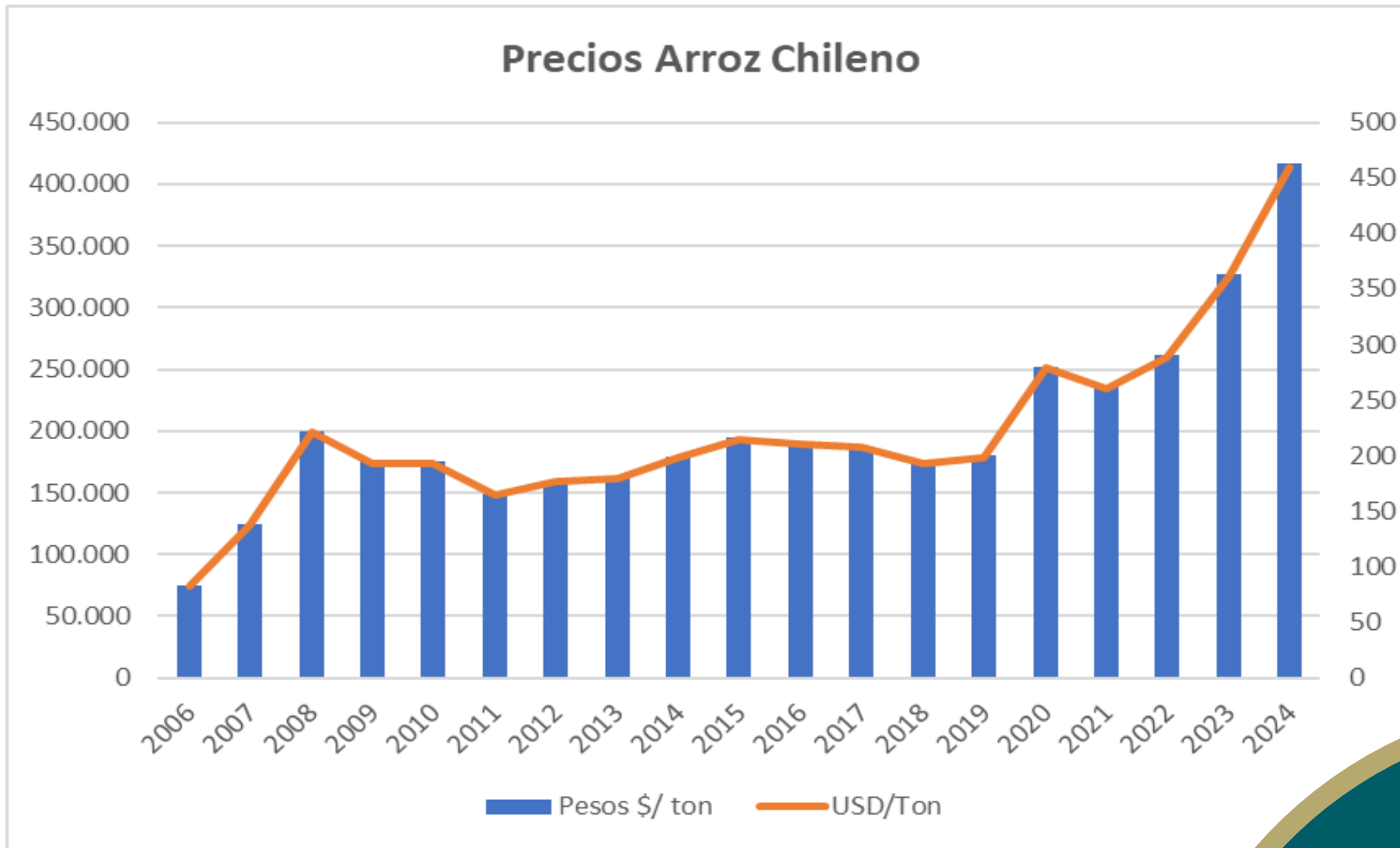


ソース: Rice Yearbook: Dataset USDA, Agricultural Marketing Service, Rice Market News
伊東正一 <http://worldfoodpicnet.or.jp/risocris/risoprice.html>, June 2015

Fuente: Charla "How is the global sushi boom influencing the japonica rice market in the world? Dictada por el Dr. Soichi Ito en The XIII International Rice Conference, 2018, Piura, Perú.



Comercialización arroz en Chile (referencia CAI)





Pensando la **sostenibilidad del rubro**....enfrentado los desafíos actuales y futuros de la agricultura

b) Impacts are driven by changes in multiple physical climate conditions, which are increasingly attributed to human influence

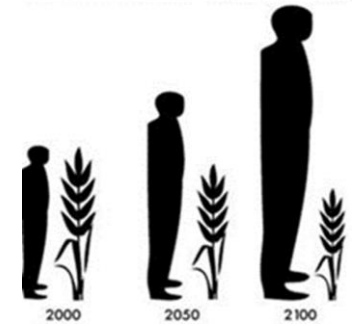
Attribution of observed physical climate changes to human influence:

Medium confidence	Likely	Very likely	Virtually certain
 Increase in agricultural & ecological drought	 Increase in fire weather	 Increase in compound flooding	 Increase in heavy precipitation
	 Glacier retreat	 Global sea level rise	 Upper ocean acidification
			 Increase in hot extremes



Agricultura en el futuro

Figure 12. Opposing Trends in U.S. Population Size (Growing Man) and Cropland Area (Shrinking Corn Stalk), 2000-2100



Arroz del futuro: Diversificado, sustentable y climáticamente inteligente





Diversificando.....

Food Measure (2018) 12:332–345
DOI 10.1007/s11694-017-9645-8



ORIGINAL PAPER

Extraction and characterization of phenolic content from purple and black rice (*Oryza sativa L.*) bran and its antioxidant activity

Amit Baran Das¹ · V. V. Goud² · Chandan Das²



Available online at www.sciencedirect.com
ScienceDirect

Chemico-Biological Interaction

Chemico-Biological Interactions 163 (2006) 218–229

www.elsevier.com/locate/chembioint

Article

Germinated Thai Black Rice Extract Protects Experimental Diabetic Rats from Oxidative Stress and Other Diabetes-Related Consequences

Chaiyavat Chaiyasut¹, Bhagavathi Sundaram Sivamaruthi¹, Noppawat Pengkumsri¹, Waranya Keapai², Periyannaina Kesika¹, Manee Saelee¹, Parichart Tojing², Sasithorn Sirilun¹, Khontaros Chaiyasut^{3,4}, Sartjin Peerajan⁴ and Narissara Lailerd^{2,*}

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J. Agric. Food Chem. 2010, 58, 10007–10015 10007
DOI:10.1021/jf102224b

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY
ARTICLE

Protective Effects of Black Rice Bran against Chemically-Induced Inflammation of Mouse Skin

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Nutrition and Cancer

Publication details, including instructions for authors and subscription information:
<http://www.tandfonline.com/loi/hnuc20>

Anthocyanins from Black Rice (*Oryza sativa L.*) Demonstrate Antimetastatic Properties by Reducing MMPs and NF- κ B Expressions in Human Oral Cancer CAL 27 Cells

Ming-Jen Fan^a, I-Chen Wang^b, Yung-Ting Hsiao^c, Hui-Yi Lin^d, Nou-Ying Tang^e, Tzu-Chieh Hung^f, Christine Quan^g, Jin-Cherng Lien^d & Jing-Gung Chung^h

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Black rice anthocyanins inhibit cancer cells invasion via repressions of MMPs and u-PA expression

Pei-Ni Chen^{a,c}, Wu-Hsien Kuo^{d,e}, Chui-Liang Chiang^c, Hui-Ling Chiou^b, Yih-Shou Hsieh^{a,*}, Shu-Chen Chu^{c,**}

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Nutrition and Cancer

Publication details, including instructions for authors and subscription information:
<http://www.tandfonline.com/loi/hnuc20>

Anticancer Activities of an Anthocyanin-Rich Extract From Black Rice Against Breast Cancer Cells In Vitro and In Vivo

Chang Hui^a, Yu Bin^a, Yu Xiaoping^a, Yi Long^a, Chen Chunye^a, Mi Mantian^a & Ling Wenhua^b

^a Third Military University, Chongqing Key Laboratory of Nutrition and Food Safety, Chongqing, China

^b Public Health School, Sun Yet-sen University, Guangzhou, China


Published online: 06 Nov 2010.





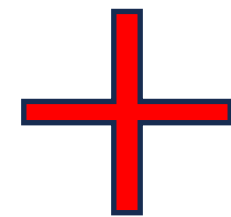
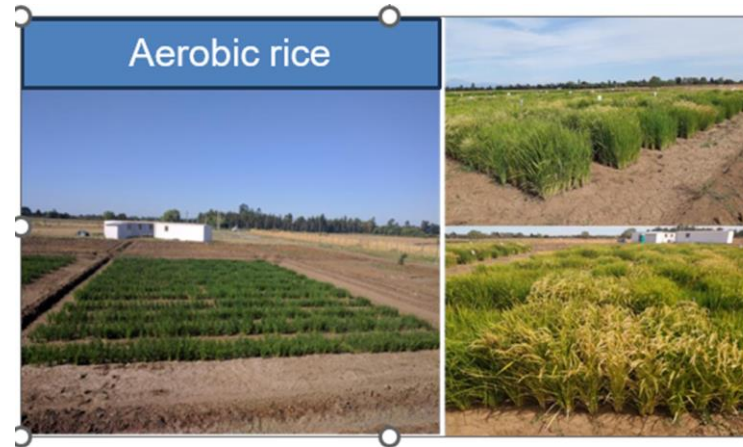
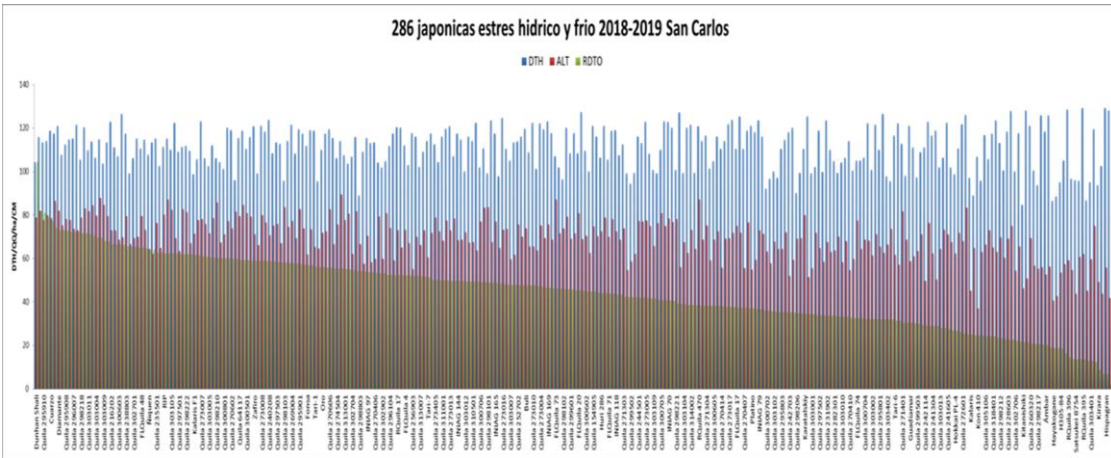
Sustentabilidad....



 **Fecha de siembra:** 6 de octubre de 2021
Localidad: Parral, Región Maule
Fotografía tomada el 24 de febrero



Arroz climáticamente inteligente.....



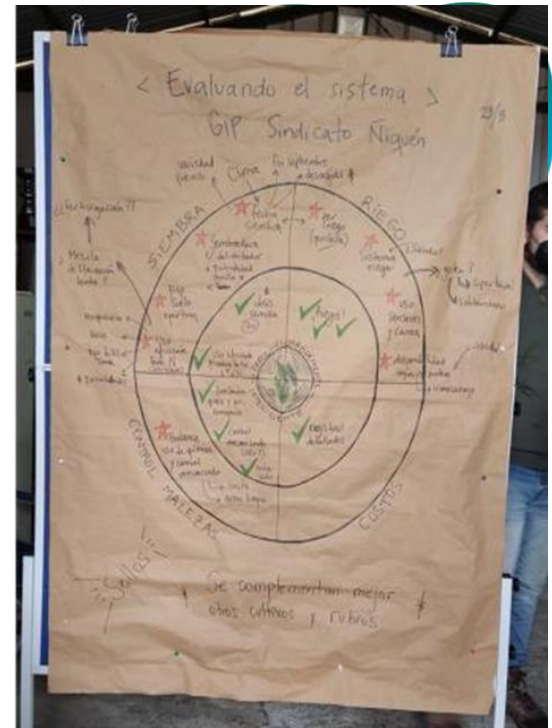
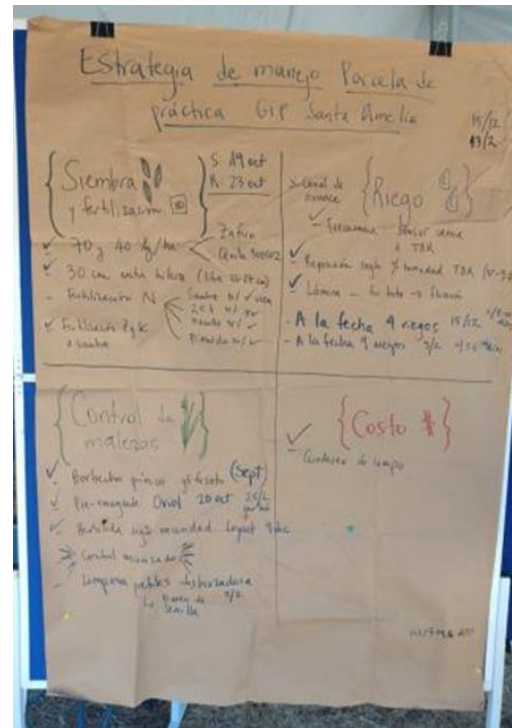
Adaptación SRI en Chile

- ✓ Siembra directa en seco hilerada
- ✓ Reducción densidad (40 - 70 Kg/ha)
- ✓ Control mecanizado de malezas (Oxigenación suelo)
- ✓ Riego intermitente el ciclo completo (saturación en floración)

Variedades adaptadas

- ✓ De alto rendimiento y calidad
- ✓ Eficientes en el uso de Agua (WUE)
- ✓ Ciclo corto

GIPs: Grupos de innovación participativa





Bonos de agua/Créditos de Carbono/No emisiones de Metano!!!!



Arroz climáticamente inteligente por goteo

Test:LSD Fisher Alfa=0,05 DMS=11,34696

Error: 147,9504 gl: 20

Genotype	Medias	n	E.E.	
Zafiro	77,53	10	3,85	A
Quila 300502	88,73	10	3,85	A B
Jaspe	94,13	10	3,85	B

Test:LSD Fisher Alfa=0,05 DMS=9,26476

Error: 147,9504 gl: 20

Riego	Medias	n	E.E.	
Underground	85,25	15	3,14	A
Aboveground	88,35	15	3,14	A

Test:LSD Fisher Alfa=0,05 DMS=16,04703

Error: 147,9504 gl: 20

Variedad	Riego	Medias	n	E.E.	
Zafiro	Underground	73,04	5	5,44	A
Zafiro	Aboveground	82,02	5	5,44	A B
Quila 300502	Underground	82,56	5	5,44	A B
Jaspe	Aboveground	88,12	5	5,44	A B C
Quila 300502	Aboveground	94,90	5	5,44	B C
Jaspe	Underground	100,14	5	5,44	C

Medias con una letra común no son significativamente diferentes ($p > 0,05$)





Arroz chileno ...el **más austral** del mundo



Equipo

- **PMGA**
- Karla Cordero L. (Mejoradora)
- Rubén Gallegos (Agronomía)
- Fernando Saavedra (Asistente de Investigación)
- Sylvia Bustamante (Asistente de Investigación)
- Rocío Retamal (Asistente de Investigación)
- Operarios: Iván Jara, Alfonso Baeza, Carlos Sánchez, Jorge Godoy, Juan Cáceres, Bryan Salazar y Francisco Sandoval)
- **Otras disciplinas**
- Lorenzo León (Malezas)
- Hamil Uribe (Hidrología)
- Rodrigo Quintana (Maquinaria)
- Juan Hirzel (Suelos)
- Gerardo Tapia (Molecular breeding)
- Marcelino Claret, Stanley Best, Paula Vargas (Agricultura precisión)
- Carola Vera (Fitopatología)
- Humberto Prieto (Biotecnología)
- Sara Hube (gases efecto invernadero)



- Fernando Barrera
- Galit Rodríguez
- Isabel Martínez
- María Paz Santibáñez



ARROZ EL ALIMENTO DEL FUTURO

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