

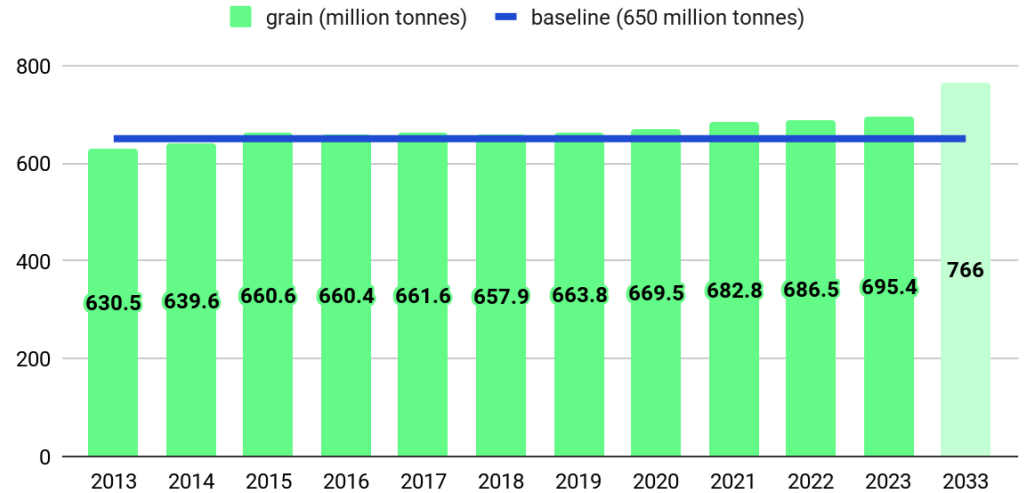
**securing harvests,
winning hearts:
will Beijing's biotech
pivot succeed?**

above the **baseline**

food security is still the main game

- priority: grain production remains above 650 million tonnes
- crop planting is stable, improving yield is urgent
- grain output totalled 695.4 million tonnes in 2023
- per capita now stands at 493 kg

grain output passes baseline nine consecutive years



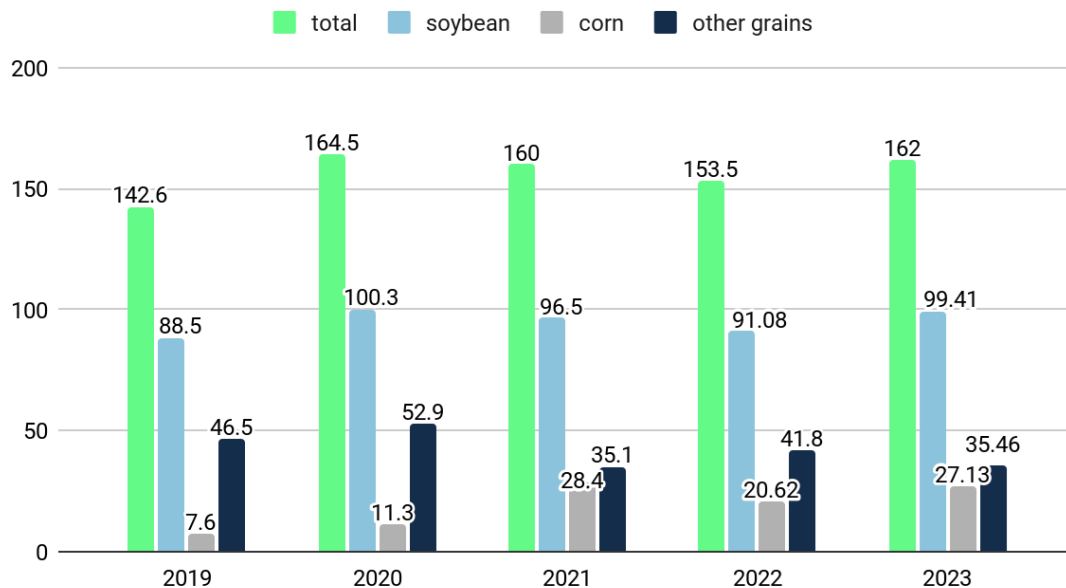
source: National Bureau of Statistics: MARA

imports impact **food security rhetoric**

50 million tonnes production increase

- ▶ calls for a grain production hike at 2023's annual Rural Work Conference and in 2024's No.1 Document
- ▶ reduce reliance on imports and mitigate risks to food security
- ▶ 2030 deadline set in action plan announced April 2024

grain imports 2019–23 (million tonnes)



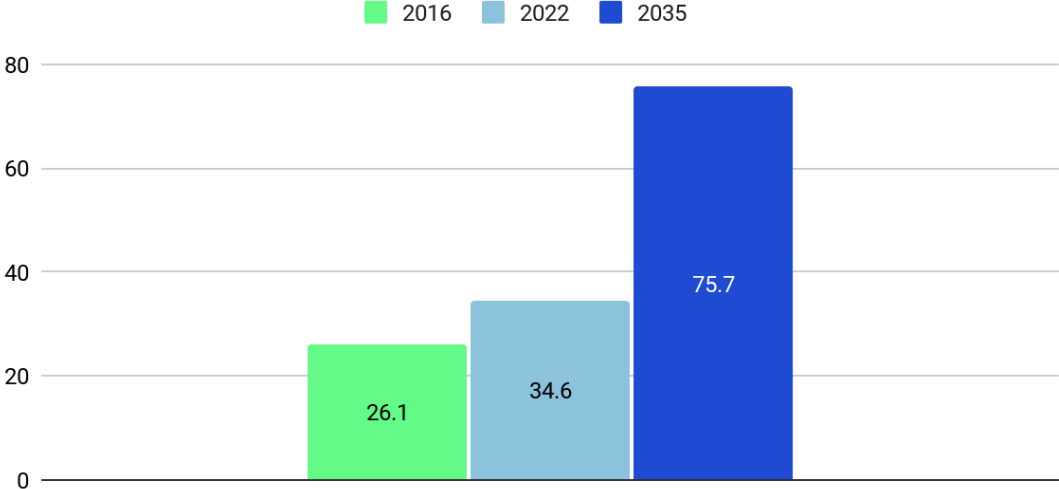
source: General Administration of Customs

meeting **meat demand**

rising animal protein appetite

- risks a further widening of the production-demand gap
- projected to peak in 2035
- feed demand to hit 331 million tonnes by 2030
 - up 35 million tonnes
 - 63 percent of action plan goal
- economic headwinds may now affect forecasts

per capita meat consumption (kg)



source: MARA Animal Husbandry Bureau Feed and Forage Division

GMOs to the rescue?

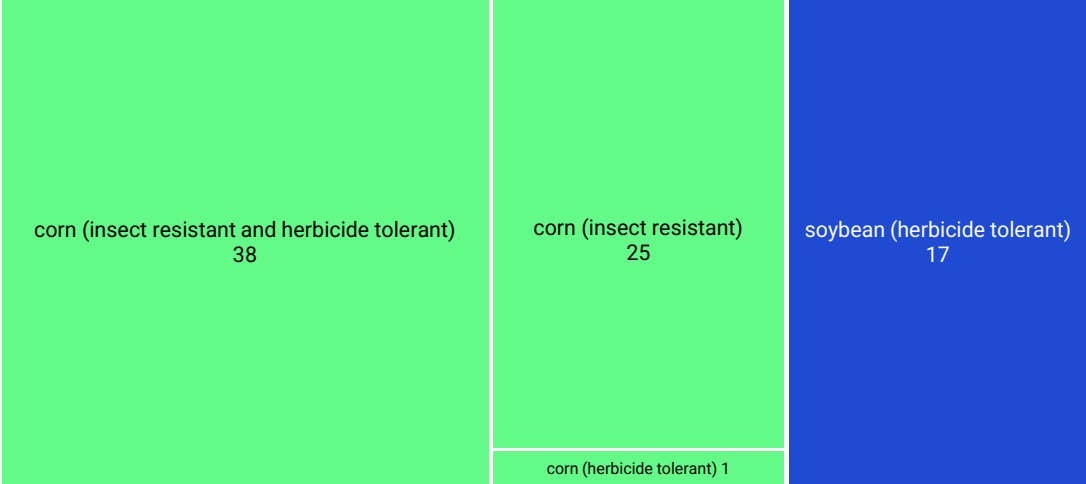


GM crop approvals

two batches received business licences

- produced by crossing a non-GM variety with a GM variety that has a biosafety certificate
- October 2023
 - 37 corn varieties
 - 14 soybean varieties
- March 2024
 - 27 corn varieties
 - 3 soybean varieties

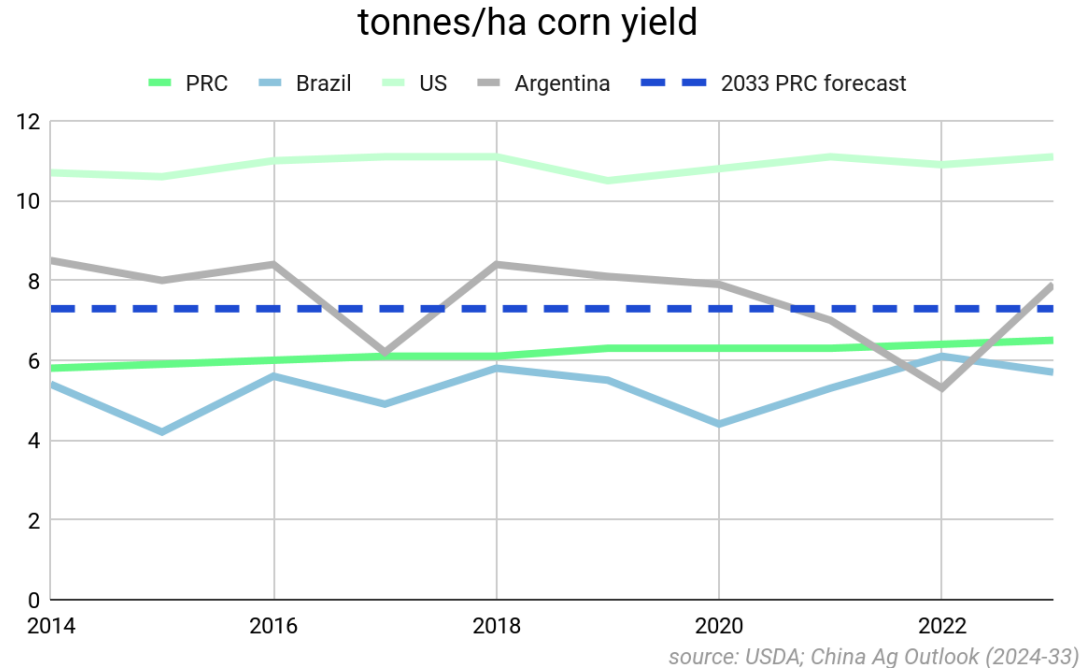
biotech trait selection



corn yield catch up

PRC corn yields fall short of competitors

- 6.5 tonnes/ha current yield
- 7.3 tonnes/ha 2033 forecast
- 12 percent increase

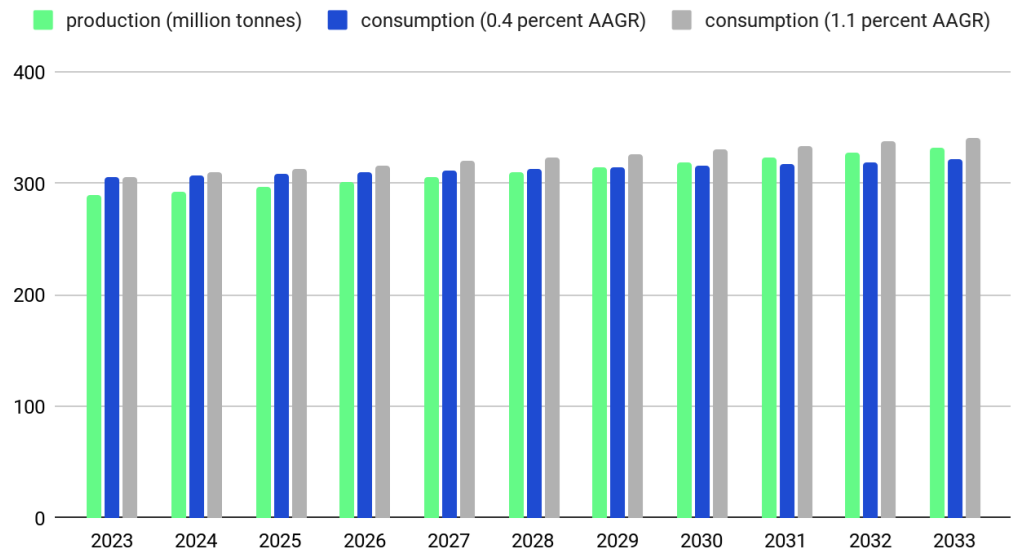


questioning corn **production-consumption gap**

2024 Outlook Report predicts self-reliance

- forecast for 2033
 - 323 million tonnes produced
 - 321 million tonnes consumed
- achieving this balance relies on full-scale GM corn rollout
- discrepancy in consumption AAGR forecast

production and consumption forecast



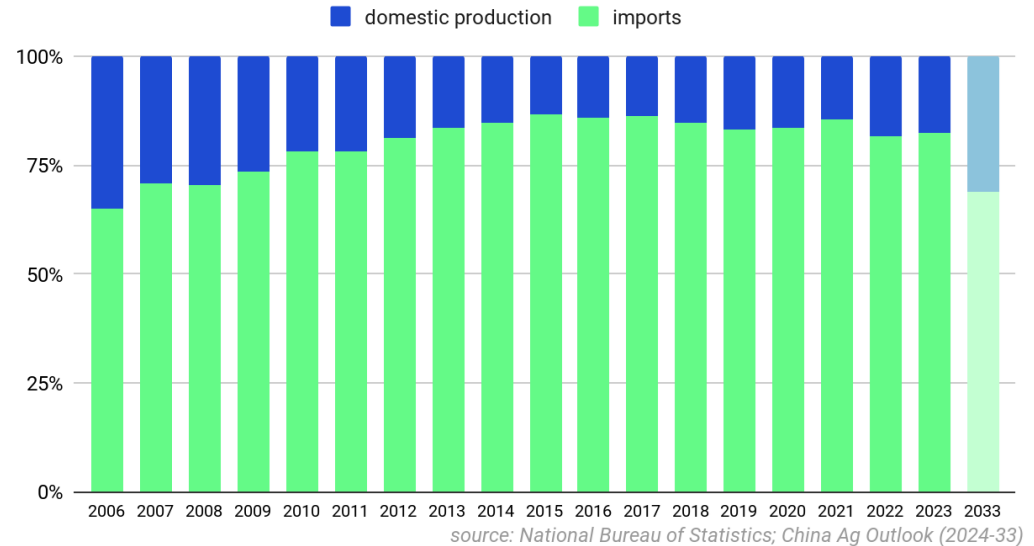
source: MARA sannong WeChat Official Account; CP calculation

soybean dilemma

sustained import dependency

- ▶ imports account for 80 percent of domestic supply
- ▶ domestic output grew 25 percent 2021–23
- ▶ imports still hit 99.41 million tonnes in 2023

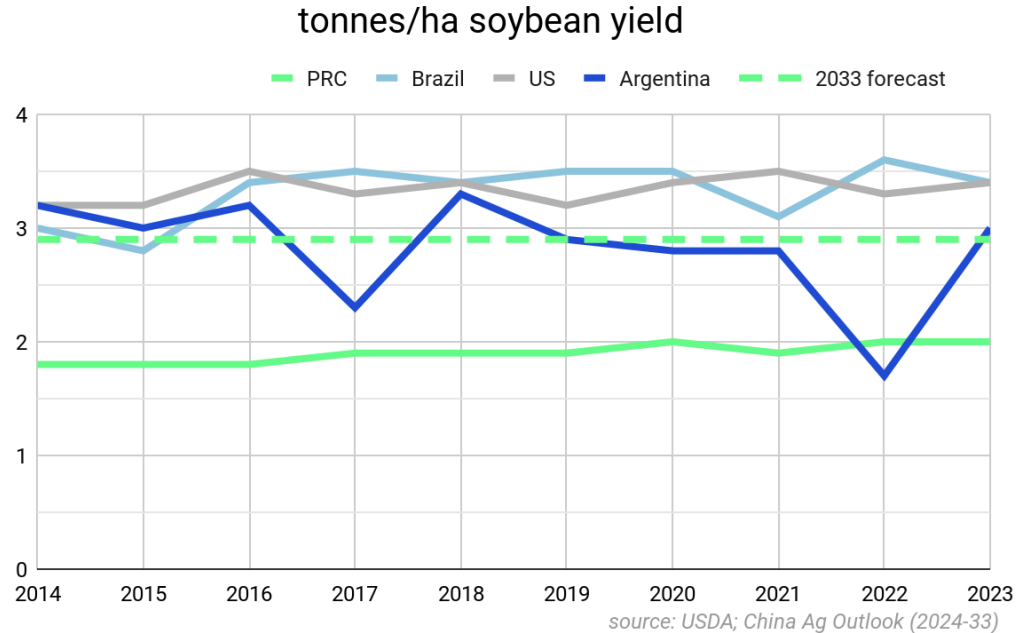
soybean domestic to import ratio



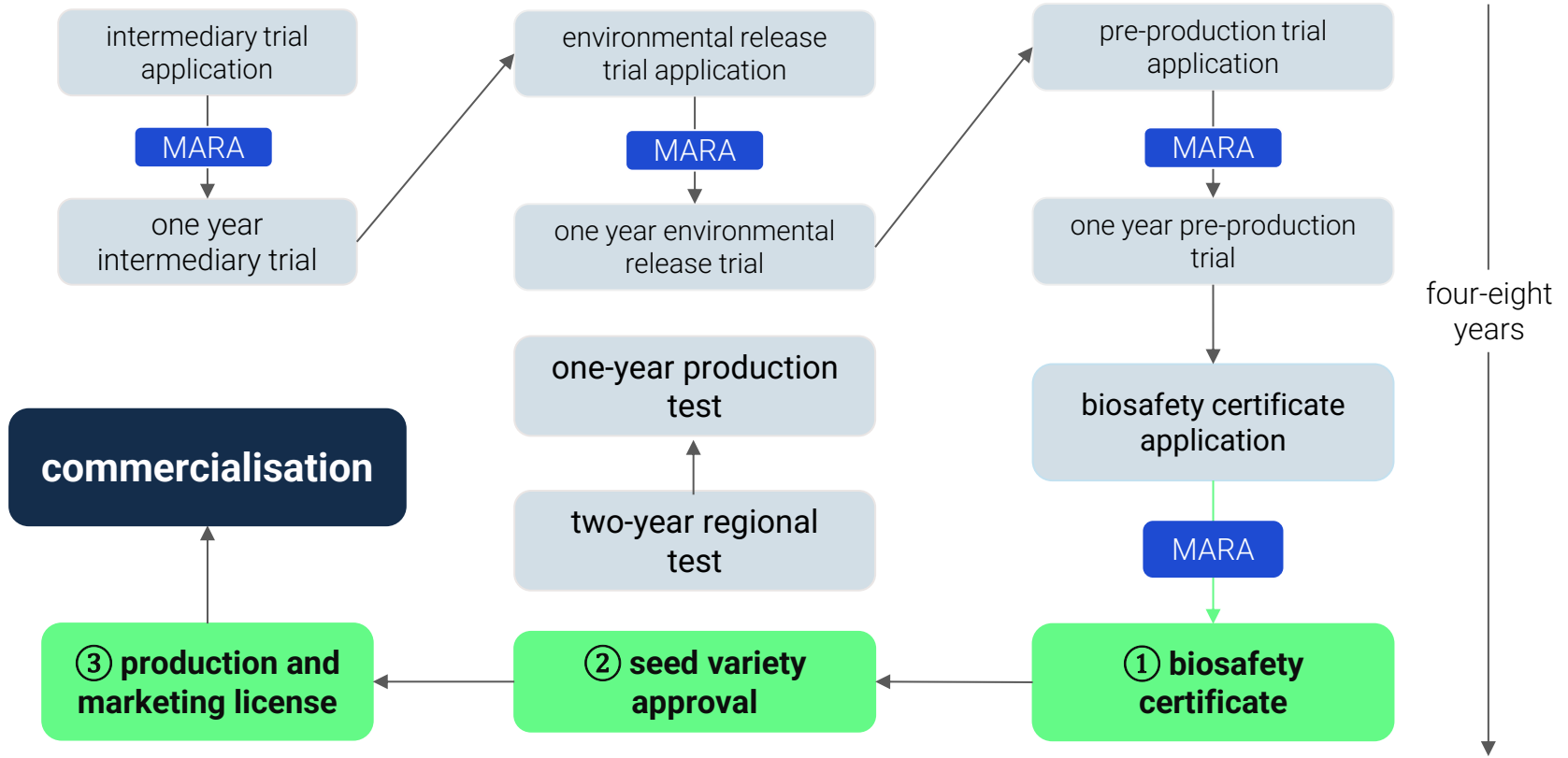
trailing soybean yields

like corn, soybean yields lag

- ▶ GM trials boosts up to 11.9 percent
- ▶ MARA '23 million tonnes by 2025' goal needs 13.3 percent increase on 2023 output
- ▶ matching Argentina's 2023 yield requires a 50 percent increase



slow **GMO** review



tackling GMO public scepticism

public concerns remain high

- factors driving scepticism include
 - cancer fears
 - infertility concerns
 - perceived differences between GM consumption in the PRC and the West
- GM soybeans passively consumed through edible oil
 - majority of soybean oil in restaurants and canteens is GM
- this is the second step of a 'three-step' plan to fully commercialise GMOs

non-edible crops

indirectly edible

directly edible

GMO setbacks

EU sends back PRC processed food

- ▶ six batches of rice-based food exports to the EU returned in September 2024
 - unapproved GM rice detected
- ▶ one batch of miso
 - contained unauthorised GM soybean
- ▶ no GM rice is approved for EU import or cultivation

illegal GMO planting continues to be a problem

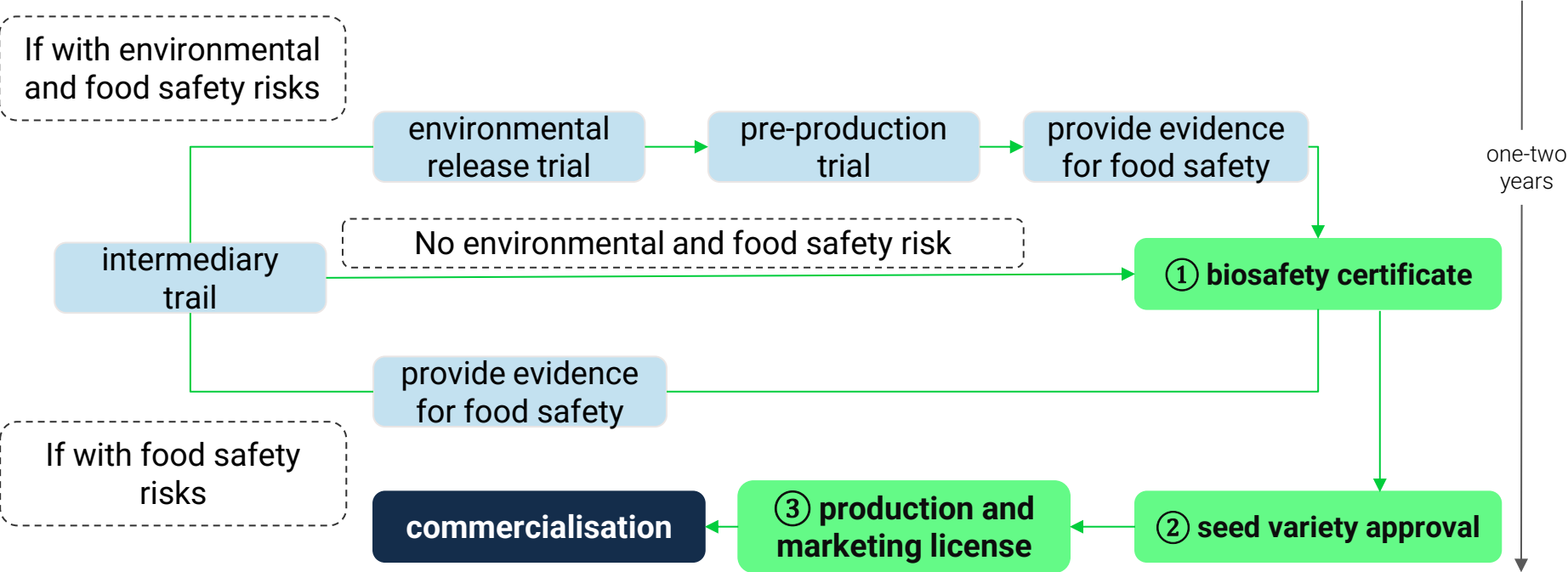
- ▶ illegal GM corn covered 70 percent of northeastern acreage in 2021 report
- ▶ six companies fined for illegal GM planting in 2023



GE crops pick up pace



expedited GE review



GE crop approvals

biotech leap forward

- ▶ new varieties promise
 - enhanced resilience
 - higher yields
 - improved nutrition
- ▶ addressing domestic food security and global ag challenges



high-yield wheat (powdery mildew-resistant)
approved May 2024



shorter-stalk corn (yield-optimising)
approved May 2024



high-oleic soybeans
approved April 2023

PRC seeds go global



seed industry **revitalisation**

seeds the 'chips' of ag

- ▶ seed industry output topped C¥10 bn in 2023
- ▶ Nanfan Silicon Valley (NSV) central
 - 2,800 seed enterprises
 - 21 research institutions
- ▶ high-quality seeds now being exported



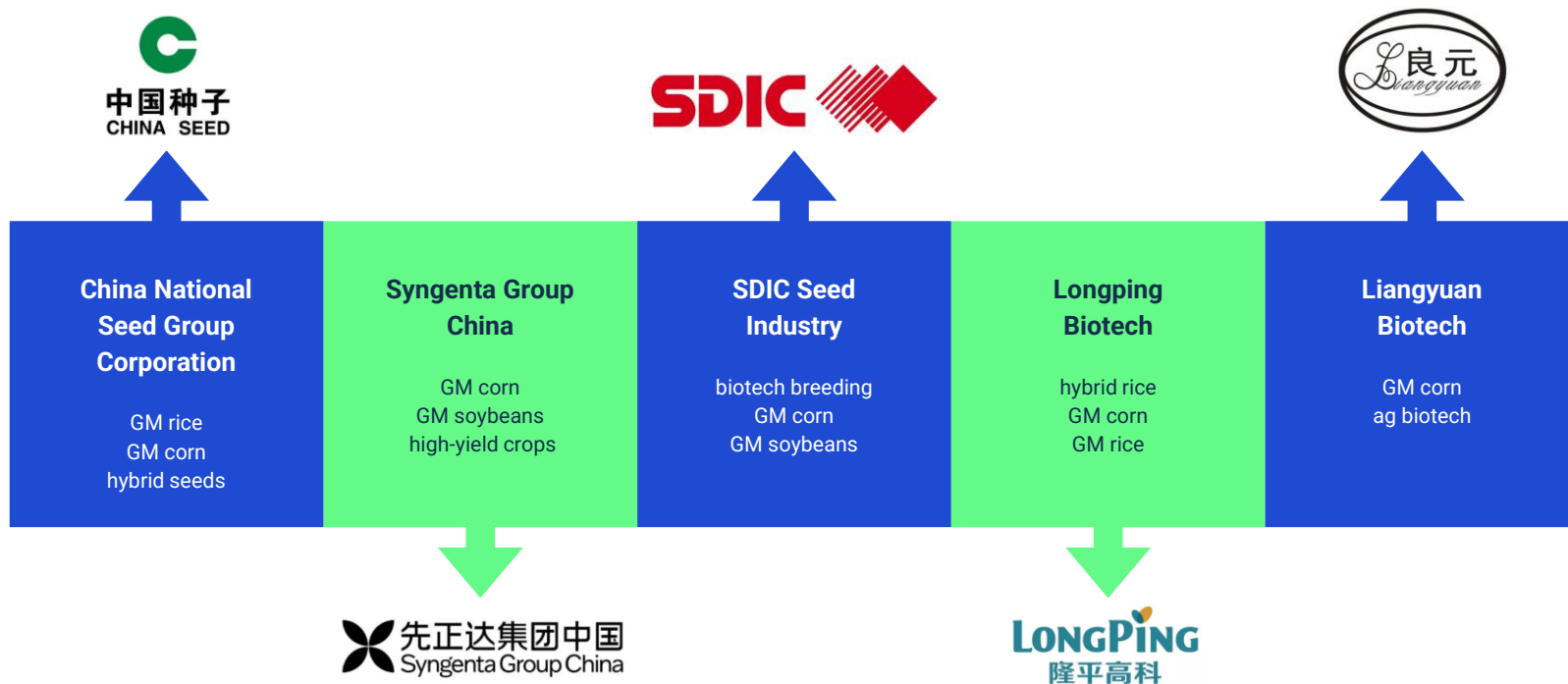
2024 China Seed Industry NSV Conference, 16–20 March, Sanya

seed R&D

3	national breeding bases	<ul style="list-style-type: none"> ➤ Hainan: Nanfan base ➤ Sichuan: hybrid corn and hybrid rice ➤ Gansu: corn and potatoes
52	breeding counties	<ul style="list-style-type: none"> ➤ connect R&D and production ➤ hybrid and normal rice, corn, wheat ➤ oilseeds and cotton
100	regional specialty breeding bases	<ul style="list-style-type: none"> ➤ grains and beans ➤ nuts, vegetables, fruits ➤ TCM, tropical crops



state-backed seed development

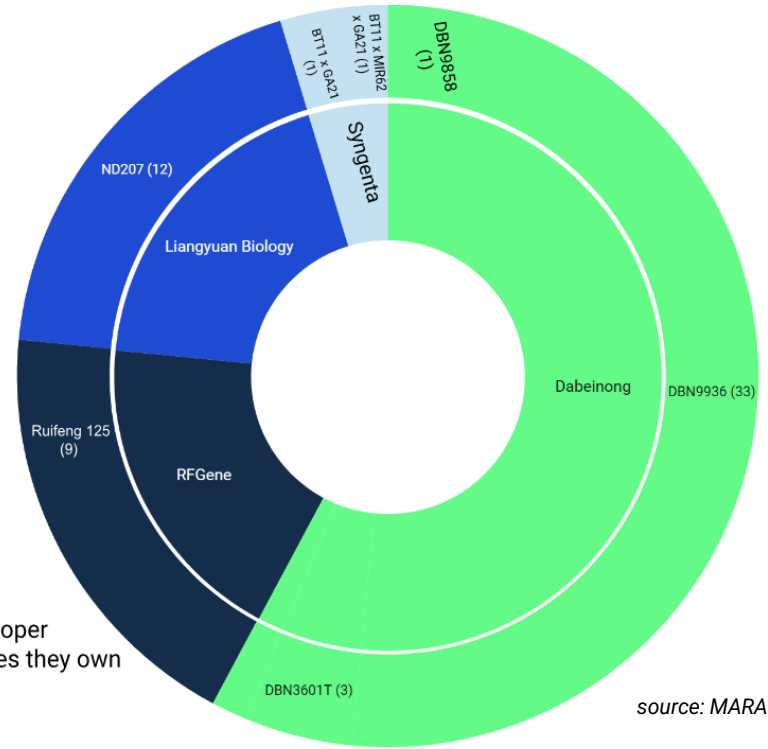


state-backed seed development

approved GMO: frequency of use for each transgenic vector

State Development and Investment Corporation

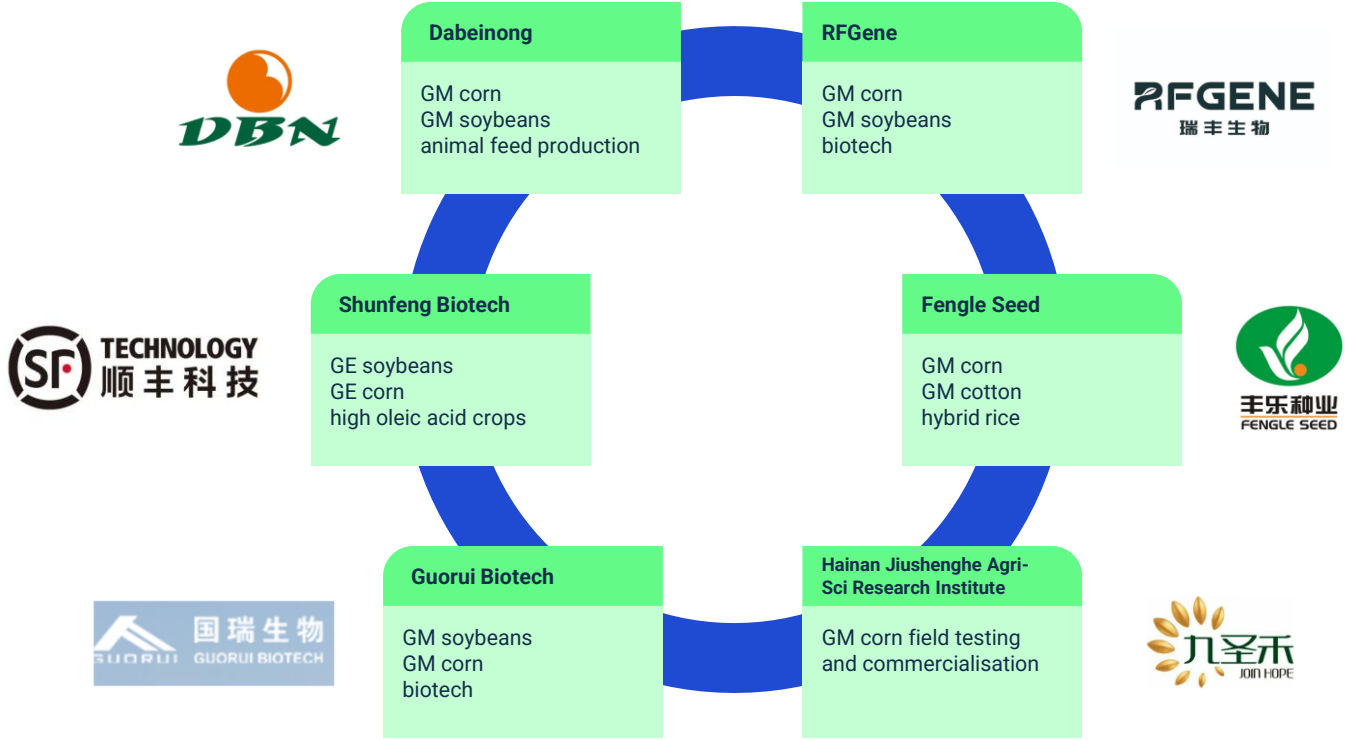
- SDIC Seed Industry (2023)
 - state-owned, with C¥4 bn registered capital
- its predecessor, SDIC Chuangyi, made key investments in
 - Longping Biotech
 - Dabeinong
 - RFGene
 - Liangyuan Biotech
- resulting in first-mover advantage in GMO breeding



inner cycle: GMO developer
outer cycle: GM varieties they own

source: MARA

privately-owned seed development



boosting African **ag** development

water-saving, drought-resistant rice

- introduced since 2020
- yields up 50 percent on local varieties
- reduces water usage by 50 percent
 - aligning with sustainable ag goals



Liu Zaochang 刘灶长 and researcher Salum check the growth of the rice in a Tanzania pilot field

will Beijing's **biotech pivot** succeed?

strong domestic momentum

political and financial support for GM and GE crop development, with state-backed investments accelerating commercialisation

first-mover advantage

leading Chinese biotech companies like Dabeinong and RFGene are leveraging early approvals to dominate domestic GM corn and soybean markets

domestic yields fall short

Despite improvements, yields may not meet the ambitious production targets necessary to close the production-consumption gap

domestic scepticism

domestic consumer hesitancy remains a major obstacle. Beijing must continue public outreach efforts to dispel myths and build trust in GM foods

expedited GE success

rapid progress in gene-edited crops, with faster approval timelines and wider public acceptance, may offset delays in GM commercialisation

long road ahead

progress is evident, the success of Beijing's biotech pivot will depend on achieving higher GM yields and overcoming public skepticism to ensure food security

anticipate **change**

in a nutshell...

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