



**Crawford
Fund** FOR FOOD
SECURITY

Sir John Crawford Memorial Address

Science Beyond Borders: Historical Foundations and an Uncertain Future

By Derek Byerlee AO

Adelaide | Tuesday, 13 October 2026



Australia: A Leader in International Agricultural Scientific Exchange & Partnership

- Exotic crops & animals, diverse agro-climatic conditions
 - Seeking innovations from overseas part of our DNA
 - e.g., A. Perkins in North Africa 1891 & 1910
- After WWII J. Crawford “institutionalized” international collaboration
 - Recognized benefits beyond AU – developing countries, Global Public Goods (GPGs)
- Today 2/3 agric. science pubs with AU authors are coauthored with an overseas scientist(s) (Aust. Innovation Stats)

Outline for Today

1. How pastures R&D at the Waite/CSIRO led to the global movement to conserve genetic resources (1960s)
2. Australia's founding role in CGIAR (formerly Consultative Group on International Agricultural Research)
3. 21st Century—New funding uncertainties & the need for renewed commitment (CGIAR)

1950s: Dryland Cereal Farming Revolution

- "Sub and super" revolution from 1920s
 - Amos Howard, farmer
- Medics to replace bare fallow in wheat rotation, 1950s
 - H. Trumble, Waite
- Already naturalized species
 - Potential of systematic plant introduction

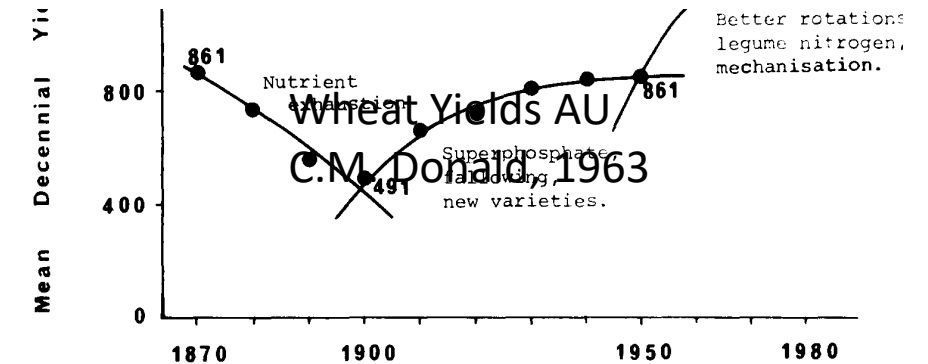


Fig.2. Australian wheat yields from 1860 to 1980. Each point indicates the unweight mean of annual yields in the preceding 10 years (From Donald, 1963, 1981).

TABLE III

Land use and production on the average farm in the Australian wheat—sheep zone 1969-

Area	Production	Super-
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1920s: Collaborative R&D via Empire Marketing Board

EMB Pasture Project 1927-34



Frank McDougall

- Renmark to EMB

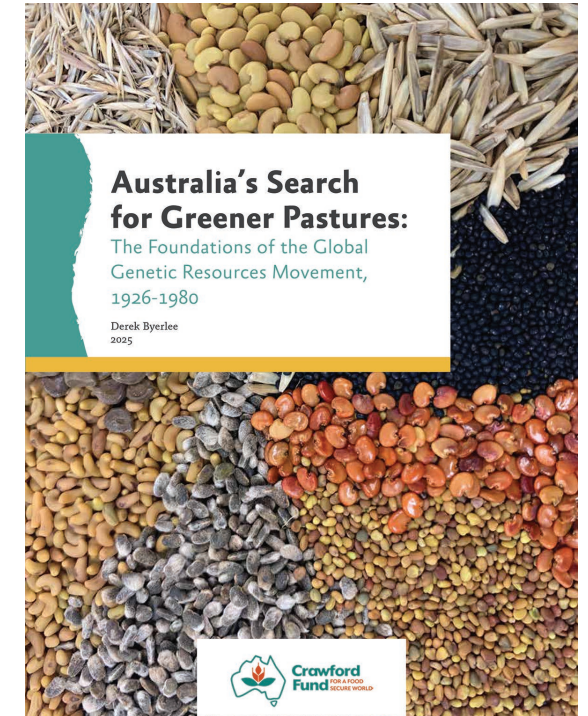
Aberystwyth as “Intellectual general HQ of pasture R&D”

- Trumble: Waite to Aberystwyth
- J. Davies: Aberystwyth to Waite

Established Waite/CSIR(O) as global leaders in Mediterranean pastures

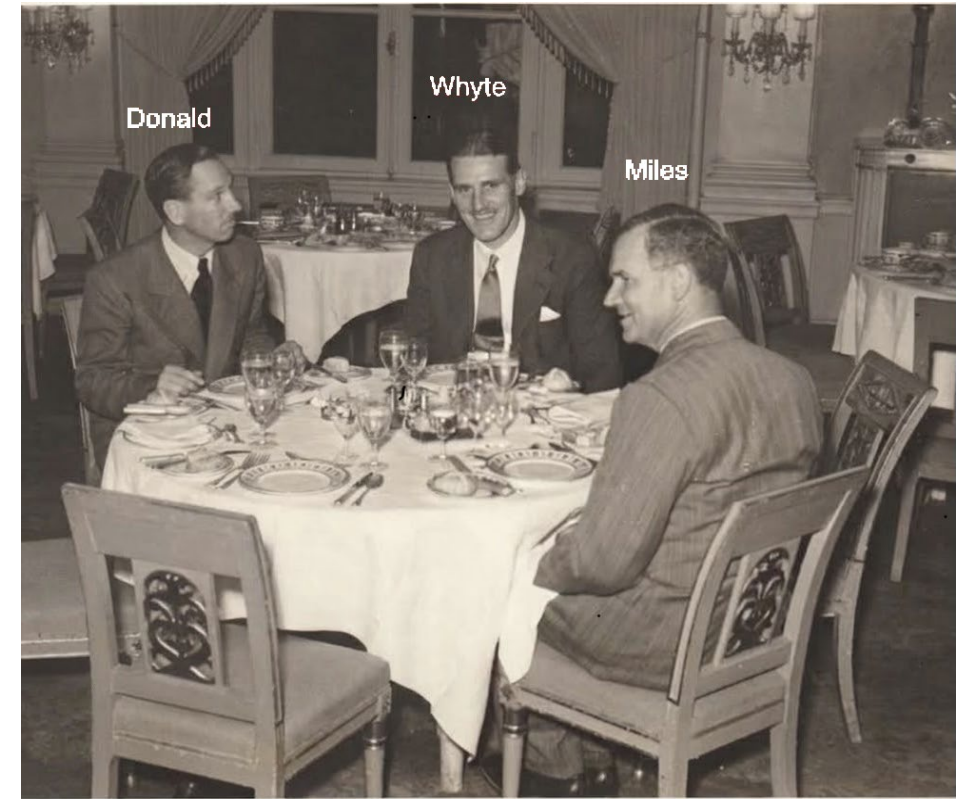
1928: First Steps on Systematic Collection

- 1928: Reconnaissance by Trumble to Nth Africa & Palestine
 - Sponsored by EMB – F. McDougall
 - "Enormous potential" for valuable discoveries
- 1928: CSIR(O) Plant Introduction Section set up
 - "Correspondence only"
- 1930s Trumble & Donald advocate "plant exploration"
 - 1946 Adelaide: O. Frankel (NZ) plea for global cooperation



1951 & 1954: First CSIRO Expeditions to Mediterranean Basin

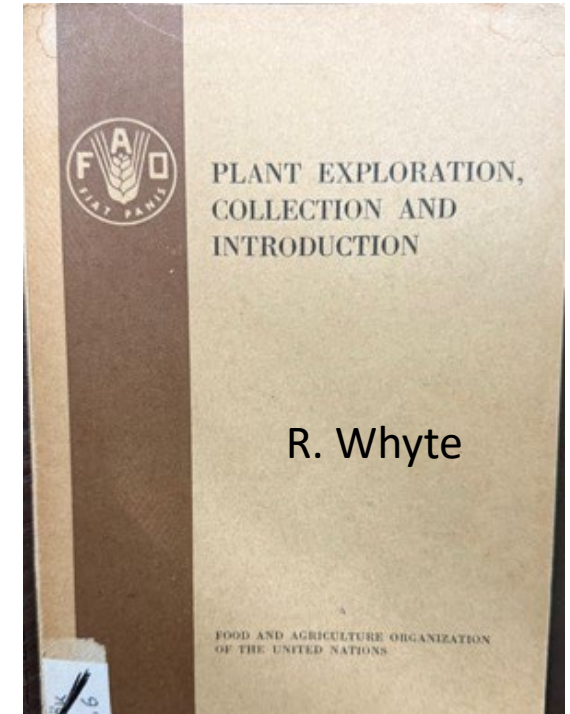
- Facilitators—Davies Bros, R. Whyte
- Cooperation with OEEC & FAO
 - Co-funding, field logistics
- Field work—Donald, C. Neal-Smith
 - Collections in 13 countries
- 15 new pasture cultivars released



C. Donald, R. Whyte & J.Miles, Rome 1951

Major Outcomes of 1950s Expeditions

- Principle of sharing germplasm with countries in the region
- Continued Australia/FAO collaboration
 - E. Crawford (SADA) - seeds of APG 1960s
- Built FAO & CSIRO as global leaders in science of introduction, collection and evaluation
 - 1st International Conference 1961
 - Chaired by W. Hartley, CSIRO

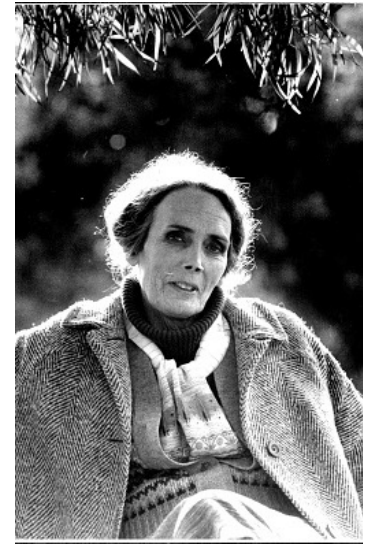


1960s: FAO/IBP Shift in Focus to Conservation

- Urgency of arresting genetic erosion
- International Biological Program
 - L. Stebbins taps Frankel (CSIRO), K. Finlay (Waite)
- 1967 FAO/IBP Conference
 - Organised by Frankel & Erna Bennett (FAO)
 - Endorsed by UN 1972 Summit
- Pastures research in Waite & CSIRO from 1920s critical to founding a global conservation movement



O. Frankel



E. Bennett

1970s: CGIAR

The Genes Board (IBPGR)

- 1971. Crawford as 1st Chair Technical Advisory Committee (TAC)
 - P. Oram (FAO) as Exec Secretary TAC
- Frankel seeks CGIAR funds for FAO-led effort
- Long debate on role of FAO
 - Crawford and Frankel
- 1974. IBPGR formed as a CGIAR/FAO hybrid
 - Successful *ex situ* conservation and genebank capacity



J. Crawford

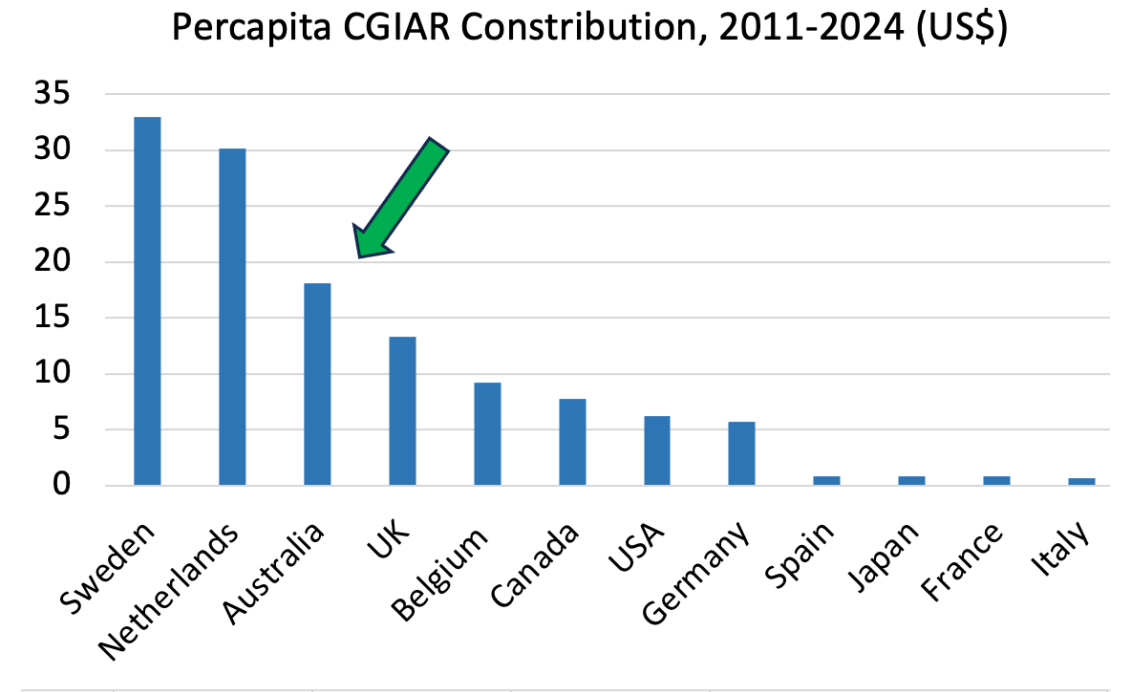
1970s: CGIAR

International Center for Agricultural Research in the Dry Areas

- 1971 CIMMYT - North Africa program
 - Test of medic rotation led by Finlay (Waite to CIMMYT), E. Carter (Waite) & J. Doolette (SADA)
- 1974 TAC recommended ICARDA (P. Oram)
 - Carter - "Australia model" of pasture legumes
- 1977 Strong collaboration with SA from Day 1
 - Forage program - Carter, Doolette, P. Cocks etc
 - Genetic resources- E. Crawford
- But transfer of Australian dryland model unsuccessful

Australia and CGIAR as Strong Partners for 50+ Years

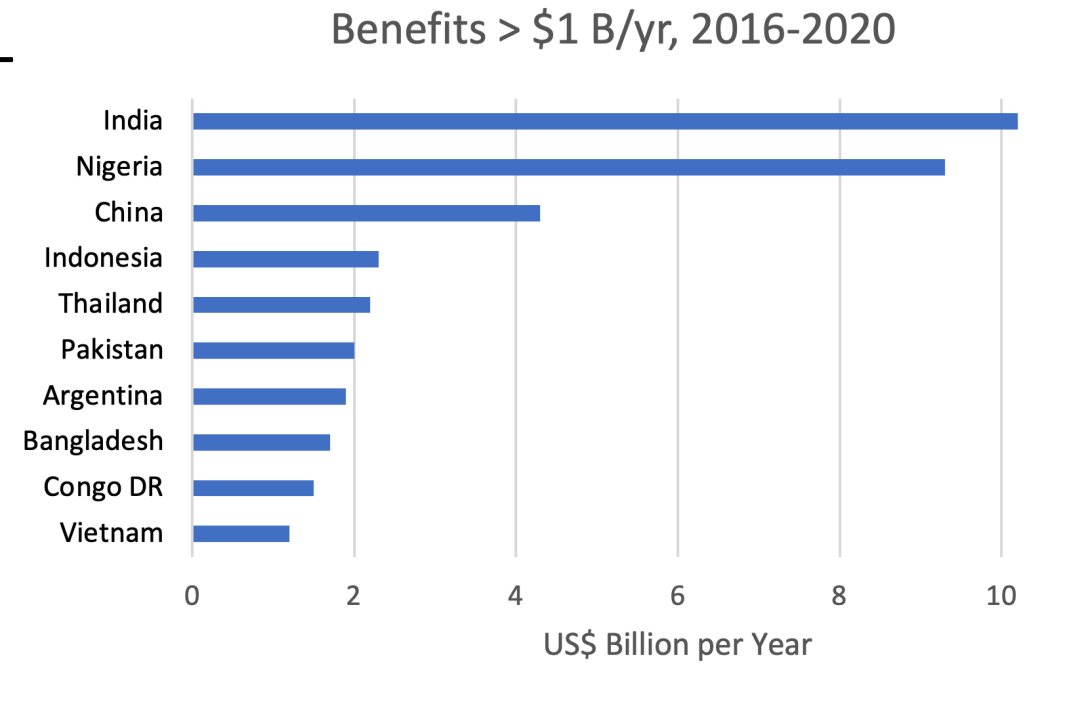
- Australia's lead role in designing 7 Centers
- Australian support
 - $\approx 4\text{-}5\%$ of CGIAR budget
- Benefits to AU \$110 M/yr c. 2000
 - Ignores benefits from disease resistance & pastures!
 - Doing Well by Doing Good! (Tribe)



AU ranks well per capita but low relative to benefits

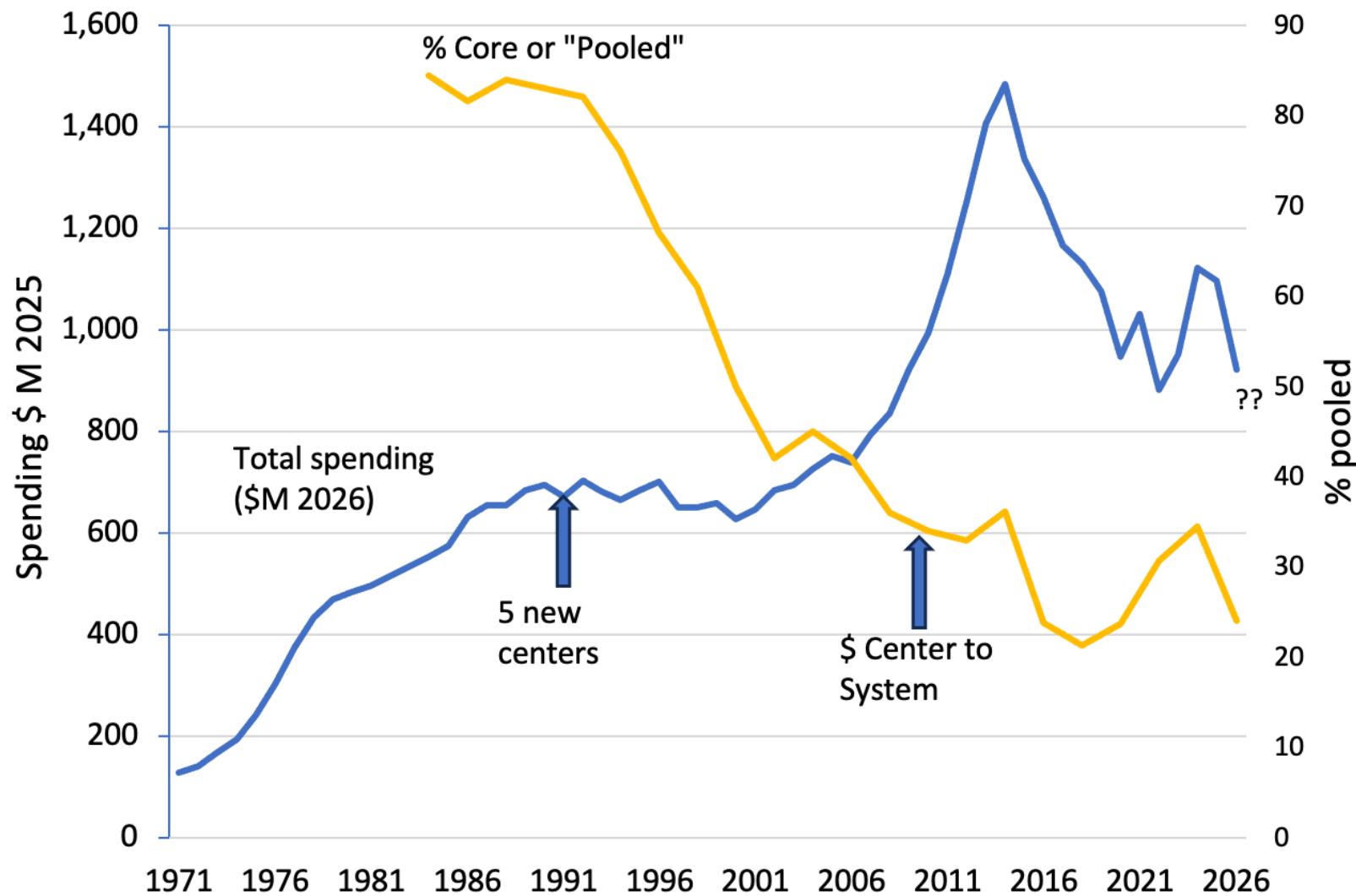
High Payoffs to CGIAR-NARS Crop Research

- CGIAR-based crop techs on 221 M Ha with benefits US\$47 B/yr 2016-20
 - 1/3 in SS Africa
- Value of Global Public Goods!



Source: Fuglie and Echeverria, 2024

21st C. Challenge: Decline & Shift in CGIAR Funding



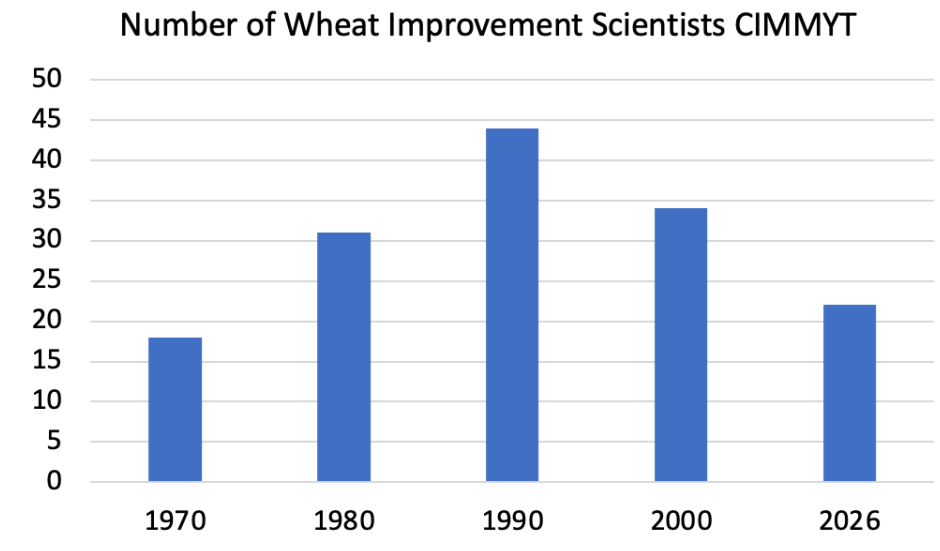
Shift from GPGs to development projects

More Head Winds in 2020s

- Volatility in food systems - climate change, pandemic, wars
- Move to a fragmented multi-polar world
 - Challenge for GPGs (including regulation of AI)
- 2025-26 - Trump shocks USA
 - Demise of USAID and ripple effects (Foreign assistance down 1/3 from 2023)
 - “Systematic assault on science” (FT)

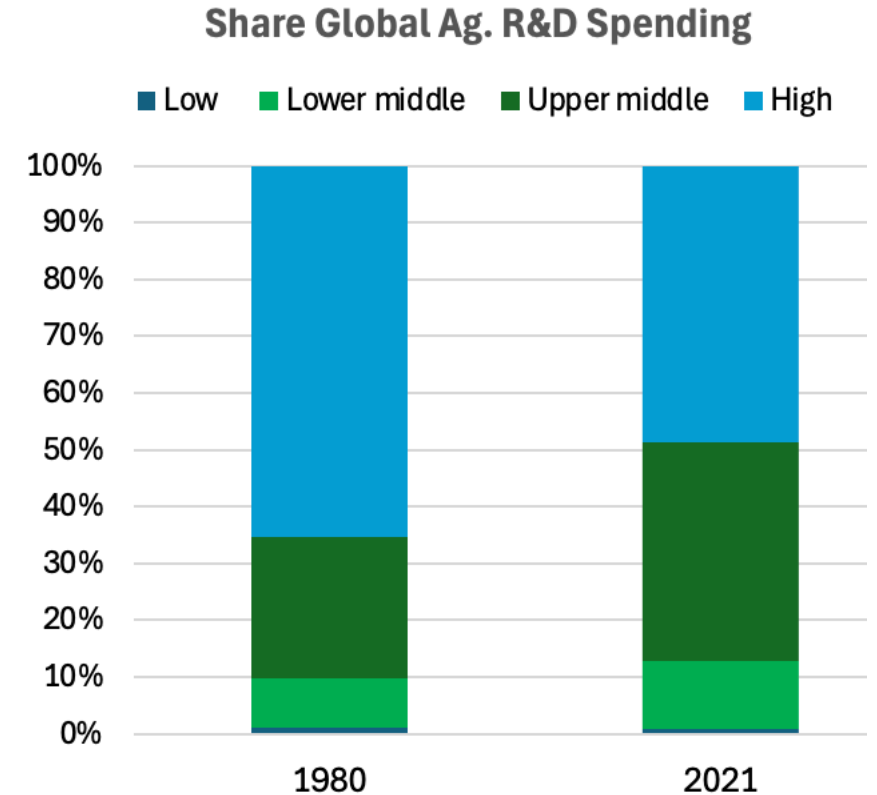
Impacts: CIMMYT Wheat Improvement

- Global asset
 - Brand, genebank, global testing
- Huge benefits - US \$2-3 B/yr
 - Benefits to AU \$30 M per yr (GRDC)
- 2026—fragile pipeline
 - Core funding from ≈\$20 M in 2014 to ≈ \$3 M in 2026
 - Staffing lowest since 1970s
 - No training—1st time since 1960



Funding Options: Middle-Income Countries (MICs)

- 55 yrs on < 2 % of CGIAR pooled funds
- But half of all Agriculture R&D in MICs
 - 3 of top 4 in no. of agric. publications
- Clone Crawford Fund to mobilize in MICs?
- Partners for Multilaterism (P4M)?



Source: Pardey et al., 2025

Options for Funding via MICs

- Regional alliances
 - Fund for Rice in Latin America
 - Hybrid seed consortia
 - Re-engage Regional Development Banks
- Mission-oriented projects to solve common problem
 - Collective funding to Center projects (WorldVeg)
 - Collective funding in kind (IWYP)
- Tightly focus scarce pooled funds on strategic GPGs
 - Genebanks, global crop disease surveillance, heat tolerance...

The Bottom Line

- Australia (& SA) has been a global leader in international research
 - “Punched well beyond its weight”
- International research cooperation arguably even more important today
 - Need for new funding modalities (CGIAR+)
- Re-invigorate Australian leadership to tackle emerging uncertainties
 - My faith in the young generation
 - Stand on the shoulders of giants—Crawford, Donald, Frankel, Bennett.....

Major Sources

- Byerlee, *Farming beyond Goyder's Line: Eurelia 1876-1976*, Researchgate.net (in press)
- Byerlee, *Australia's Search for Greener Pastures; The Foundation of the Global Genetic Resources Movement*. Crawford Fund, 2025
- Lynam et al., "The Fifty-year Odyssey of the CGIAR", *Food Policy*, 2024