

National Centre for Plant Genetic Resources

We ♥ Diversity



Maja Boczkowska, Anna Rucińska

Gene Bank

1750 Gene Banks
7,5 mln accessions

Crops



Crop Wild Relatives



Wild species



Gene Bank

Major tasks:

- Collecting
- Preserving
- Storing
- Maintaining in a viable state
- Evaluating
- Reproducing
- Sharing

National Crop Plant Genetic Resources Protection Program





Crop Genetic Resources Conservation Program:

~ 86,000 plant accessions

Long-term storage:

~75,000 seeds accession

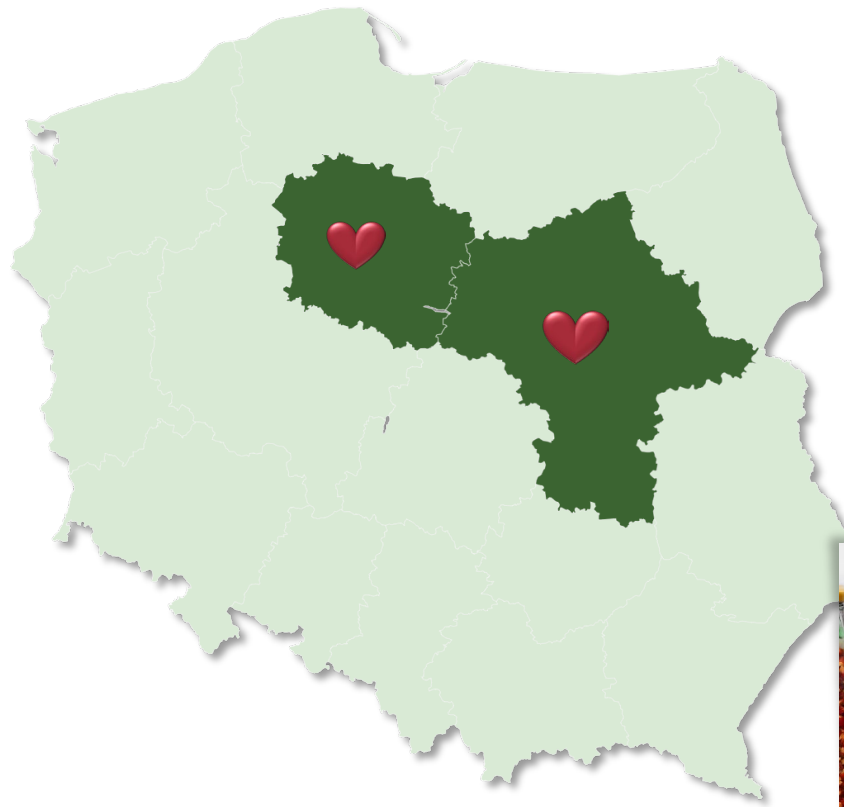
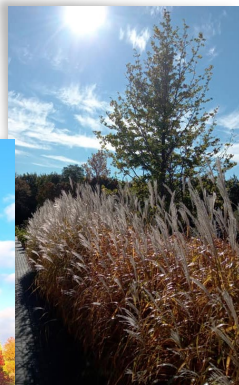
- 30% cereals
- 20% grasses
- 14% vegetables
- 10% legumes
- 24% other (fruit, medicinal plants, oil)



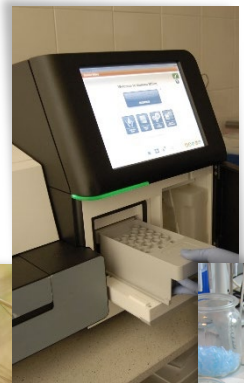
Svalbard
Global Seed Vault



Bydgoszcz



Radzików



Instytut Hodowli i Aklimatyzacji Roślin
Państwowy Instytut Badawczy

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Long-term Storage

dr Anna Rucińska

mgr Barbara Sobiech-Szczapa
Jolanta Adamczyk
Elżbieta Susek
Elżbieta Tarczyk
Elwira Zdanowska



Botanic Garden

mgr Jarosław Mikietyński

dr Bartosz Tomaszewski
mgr Joanna Chodkiewicz
mgr Kinga Moskal
mgr Adrianna Szmyd
Monika Siedlecka
Marek Glazik
Krzysztof Szreiber
Marzena Kwiatkowska



Molecular Biology Lab

dr Marta Puchta-Jasińska

dr Maciej Adamowski
dr Aleksandra Pietrusińska
mgr Paulina Bolc



Herbarium

Field Evaluation

dr Wiesław Podyma

mgr Dorota Dziubińska
Tomasz Lubas
Iwona Poleć
Ewa Tysiąc
Izabela Zagalska
Izabela Gałoń
Beata Kisiela



Staff: 34

dr hab. Maja Boczowska
mgr Agnieszka Osińska



Cryobank

dr Karolina Tomiczak

mgr Magdalena Białoskórska



Database & Bioinformatics

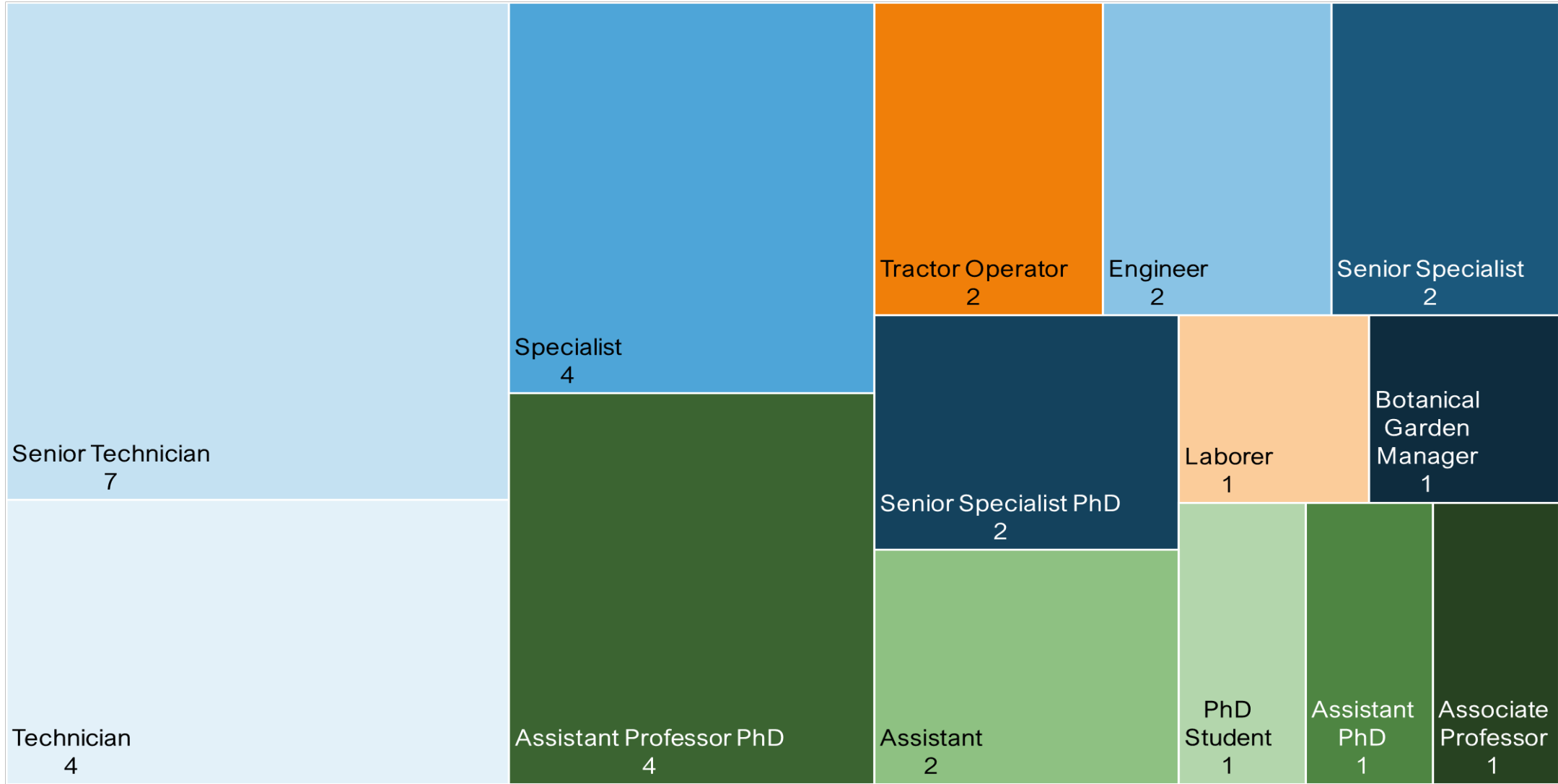
mgr Renata Kowalik

mgr Adrian Motor
mgr Szymon Puła



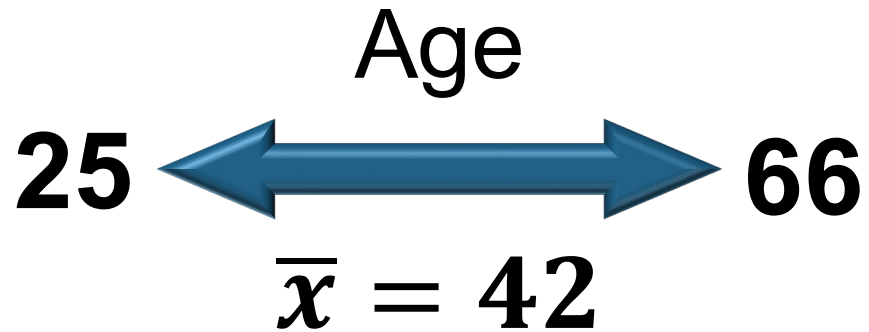
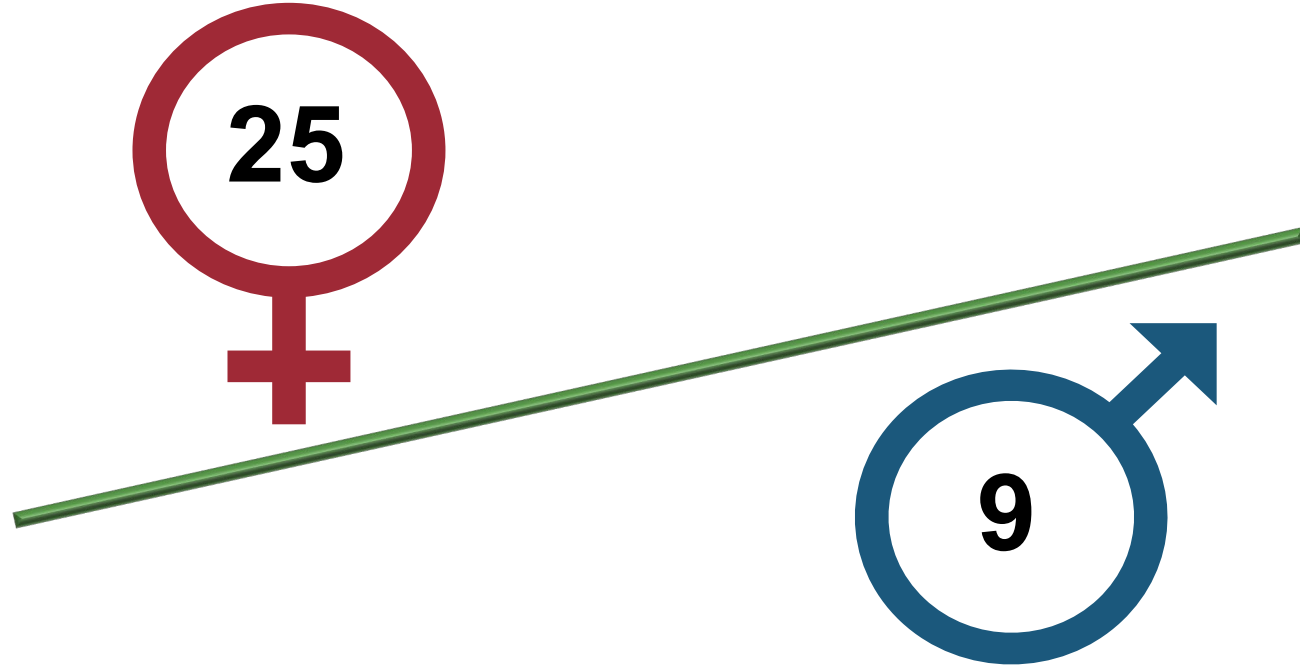
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Gender



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Long-term Storage

Seed drying facility



Active collection
(5 chambers, 0°C)



Base collection
(3 chambers, -18°C)



Seed viability = Seed aging

„It is very unhealthy to live. The one who lives, dies.”

Stanisław Jerzy Lec



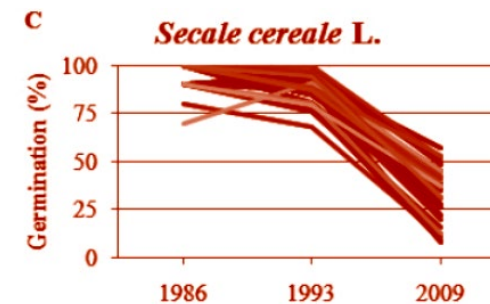
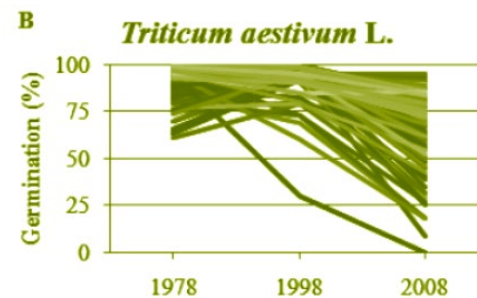
Nelumbo nucifera
~1350 ± 220 years



Lactuca sativa
~5 years

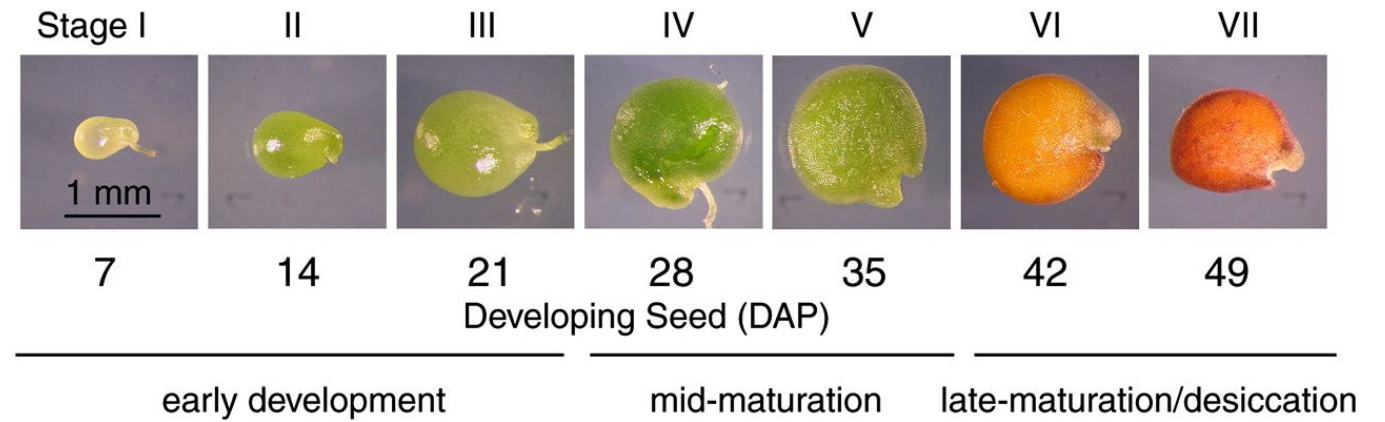


- Species
- Variety
- Seed lot
- Individual



Seeds quality

- Mechanical damages
- Pests
- Diseases
- Maturity



Chen et al. 2009



Seeds viability

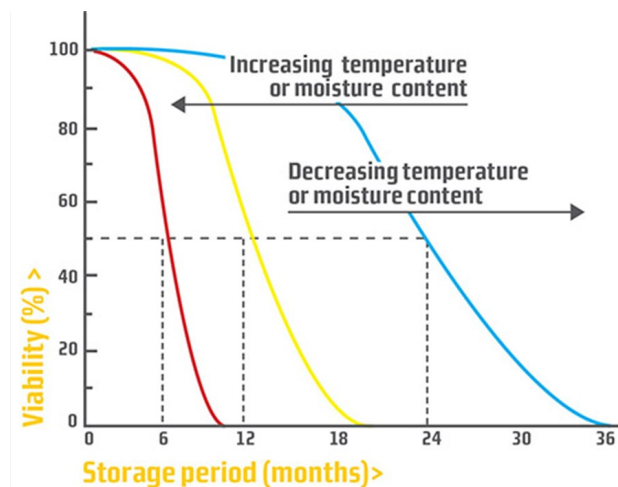
Germination tests:

- 6500 accessions per year

„Thumb rules of drying seeds”

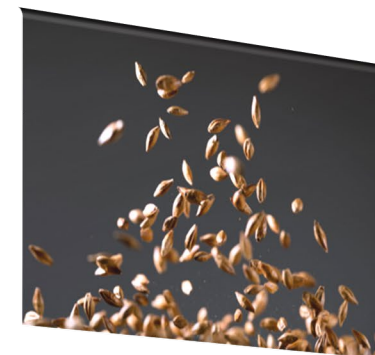
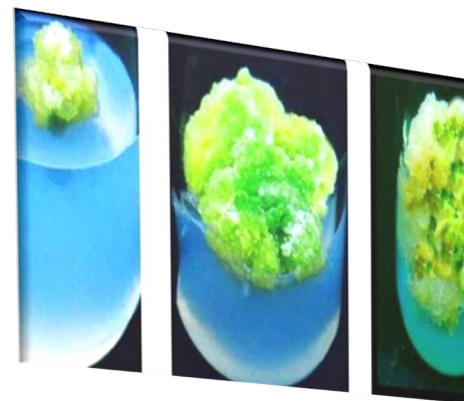
(Harrington, 1960)

Seed lifespan doubles with a 1% decrease in hydration and a 5°C decrease in ambient temperature



Scientific interests:

- Genetic diversity
- Molecular background of seed aging
- Molecular background of cryopreservation tolerance
- Epigenetic effects of cryopreservation
- Molecular background and sources of abiotic stress tolerance – drought
- Molecular background of disease resistance
- Whole-genome sequencing of maize





Ministerstwo Rolnictwa
i Rozwoju Wsi



Ministerstwo Nauki
i Szkolnictwa Wyższego



NATIONAL
POLAND

SCIENCE CENTRE



Agencja Restrukturyzacji
i Modernizacji Rolnictwa



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Państwowy Instytut Badawczy

We  **Diversity**



- **Preludium 18 – dr Marta Puchta-Jasińska**
 - Profiling of sRNA expression during seed germination after long-term storage
- **Preludium Bis 3 – dr hab. Maja Boczkowska**
 - Transcriptomics of freezing biological systems based on the differential tolerance of apple buds to cryogenic storage
- **Miniatura 7 – dr Karolina Tomiczak**
 - Effect of cryopreservation techniques on the (epi)genetic stability of interspecific somatic hybrids of gentians



AGENT

- Activated GEnebank NeTwork AGENT
- Duration: 2020 – 2025
- GA 862613



INCREASE

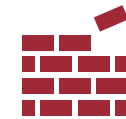
- Intelligent Collections of Food-Legume Genetic Resources for European Agrofood Systems
- Duration: 2020 – 2026
- GA 862862





SPUB-I

- Central Information System for the Gene Bank – EGISET
- Duration: 2021 - 2024
- 1/491859/SPUB-I/SN/2021



SPUB

- Molecular Laboratory of the Gene Bank
- Duration: 2023 - 2025
- 25/564778/SPUB/SN/2023





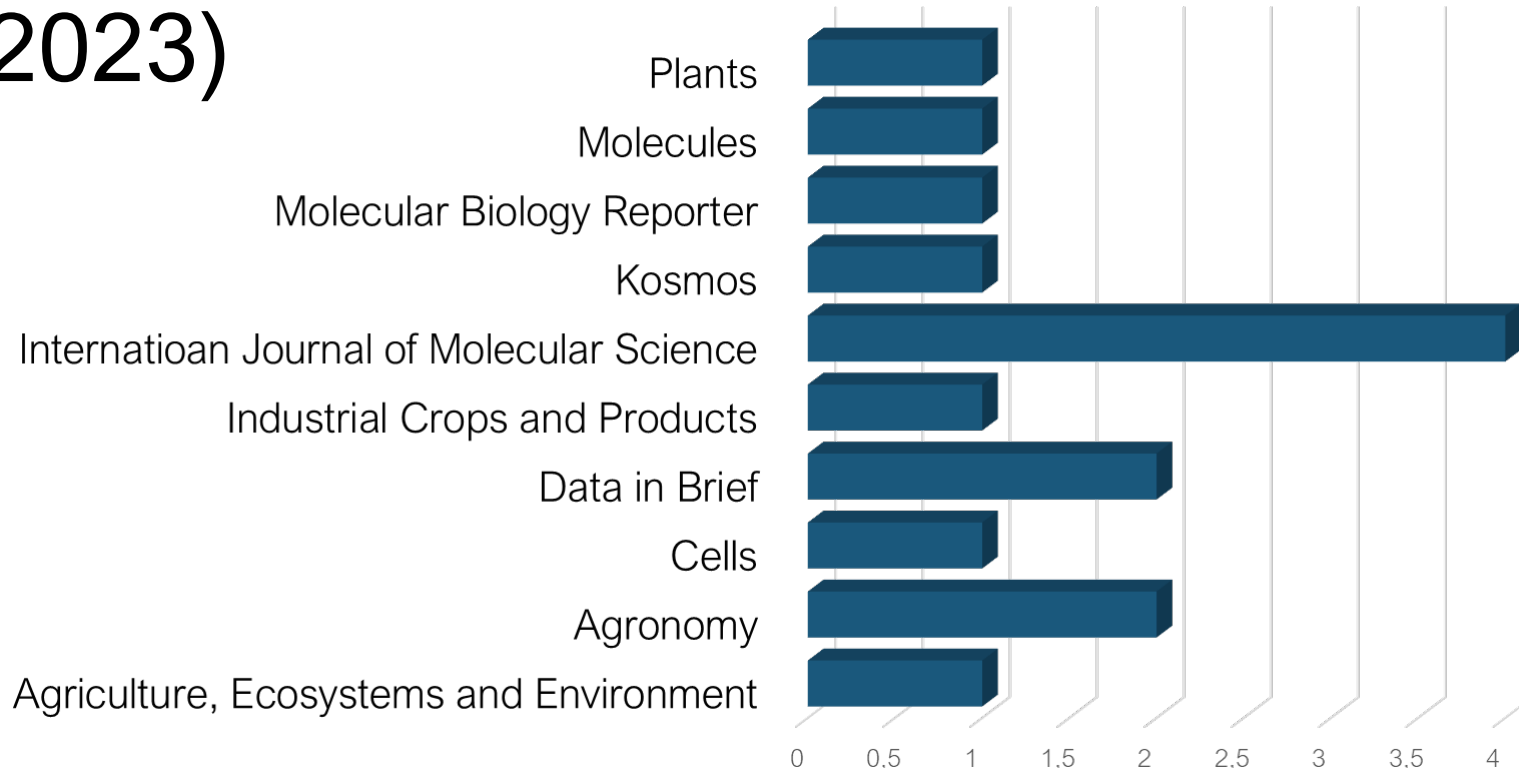
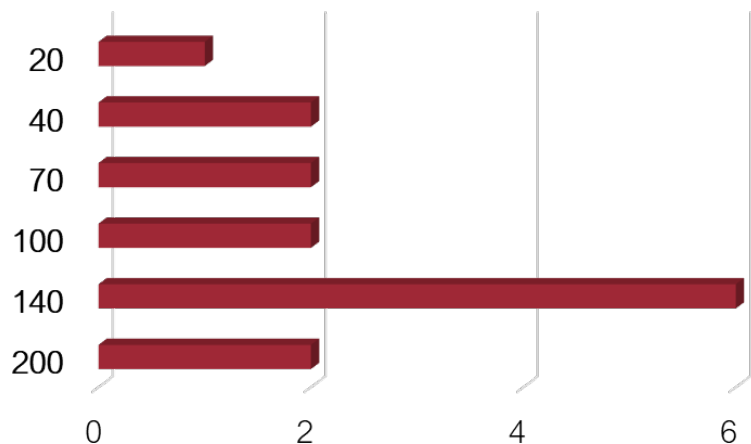
Agencja Restrukturyzacji
i Modernizacji Rolnictwa

- Działanie Współpraca – dr Bartosz Tomaszewski
 - Feed from millet (Pasza z prosa)
 - Duration: 2022 – 2024
 - 00065.DDD.6509.00038.2019.11



Instytut Hodowli i Aklimatyzacji Roślin
Państwowy Instytut Badawczy

Publications (2022 – 2023)



120/PY


	2022	2023	total
MNISW	870	810	1680
IF	34,4	27,5	61,9
No.	8	7	15

 Agriculture, Ecosystems & Environment
Volume 324, 1 February 2022, 107683

Is it possible to understand a book missing a quarter of the letters? Unveiling the belowground species richness of grasslands

[Anna Rucińska](#)^a, [Sebastian Świercz](#)^{a,b}, [Marcin Nobis](#)^{c,d}, [Szymon Zubek](#)^c, [Maja Boczkowska](#)^{a,e}, [Marcin Olszak](#)^f, [Jan G. Kosiński](#)^g, [Sylvia Nowak](#)^h, [Arkadiusz Nowak](#)^{a,h}

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 Industrial Crops and Products
Volume 208, February 2024, 117845

An effective cryobanking approach preserving the genetic, physiological and phytochemical stability of *Polyscias filicifolia* Bailey hairy roots

[Anita A. Śliwińska](#)^a, [Karolina Tomiczak](#)^{b,c}, [Maciej Obreński](#)^a, [Beata Wileńska](#)^{d,e}, [Rafał M. Kietkiewicz](#)^a, [Małgorzata Podwyszyńska](#)^f, [Joanna M. Zieleznicka](#)^a, [Anna Mikula](#)^b, [Katarzyna Sykłowska-Baranek](#)^a

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**Think
outside
the ~~BOX~~**

jar

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