



Forages in Minnesota

Jake Jungers, Associate Professor, University of Minnesota
2026 North American Alfalfa Improvement Conference

July 14, 2026
Stillwater, MN

Welcome to Minnesota!



History of Forages in Minnesota

- Wendelin Grimm

Table 1. Bacterial wilt resistance, winterkill following a severe winter and forage yields at Rosemount, MN. Source: Minnesota Agricultural Experiment Station (AES) Varietal Trials, Report 24, December 1961, and USDA AES Technical Bulletin 1571.

Variety	Developer	Year*	B. wilt resistance**	Winterkill	Forage yield
				%	tons/acre
Grimm	W. Grimm	1900	S	39	2.5
Ladak	India	1910	MR	55	3.7
Ranger+	USDA; NE AES	1942	R	19	4.2
Narrangansett	RI AES	1946	S	59	4.3
DePuits	Tourneur Freres	1947	S	83	4.1
Vernal+	USDA; WI AES	1953	R	19	4.5
Lahontan	USDA; NE AES	1954	R	17	2.4
Rambler	Agric Canada	1955	R	46	3.6
Buffalo	USDA; KS AES	1943	R	27	4.3
Teton	SD AES	1958	R	20	3.5



History of Forages in Minnesota



Agriculture Research
Service

USDA – Walter Wedin, Gordon Marten, Donald Barnes, Michael Russelle, JoAnn Lamb, Hans Jung



UMN

- A.C. Arny (1909-1946)
- A.R. Schmid (1946-1977)
- Craig Sheaffer (1977-2025)

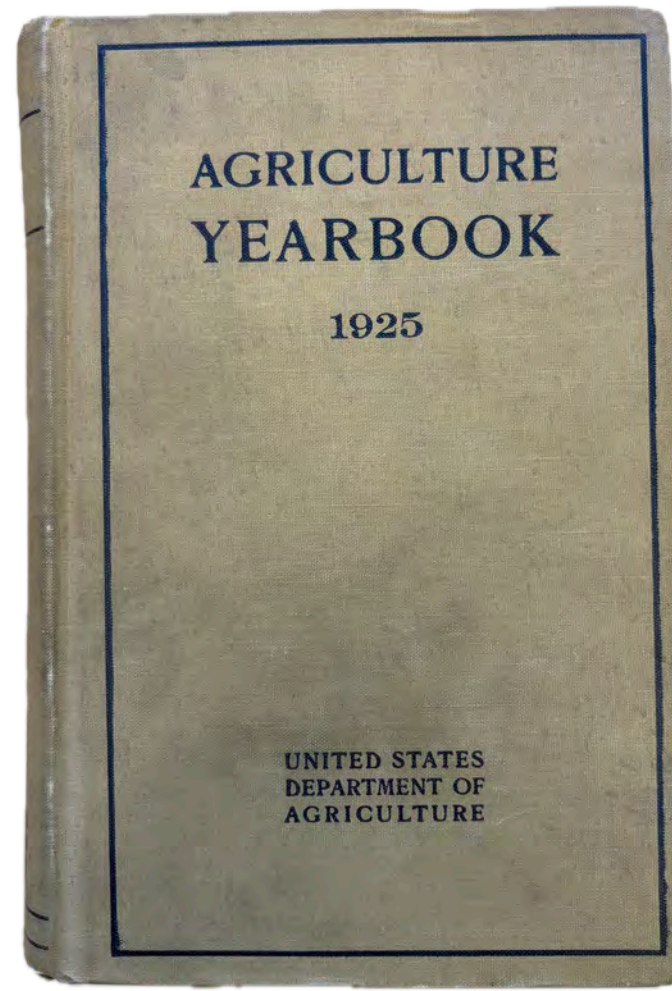
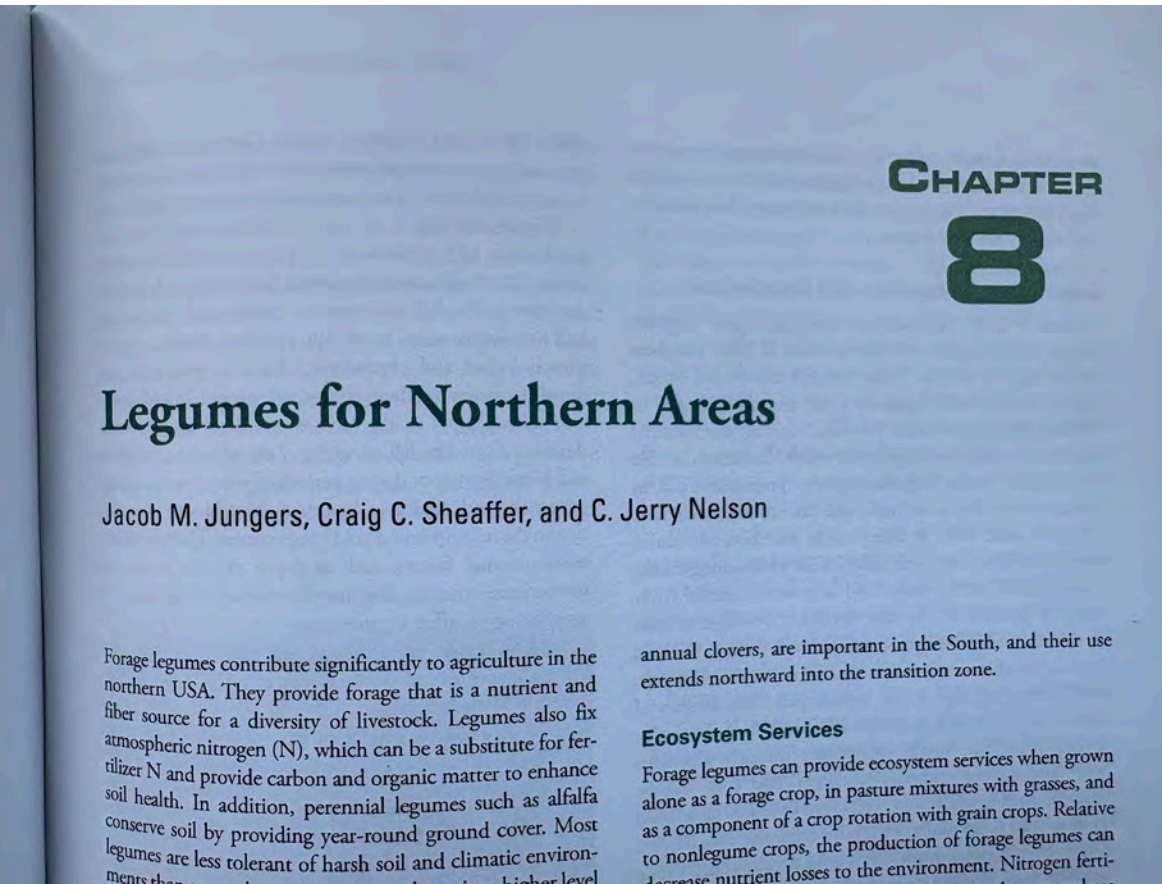
History of Forages in Minnesota

- Craig Sheaffer – more than 45 years of forage research at UMN
 - Joined NAAIC Planning Committee in 1986
 - Served on NAAIC Executive Committee from 2000 – 2022
 - >275 peer reviewed papers
 - 25 book chapters
 - Thousands of undergraduate students



History of Forages in Minnesota

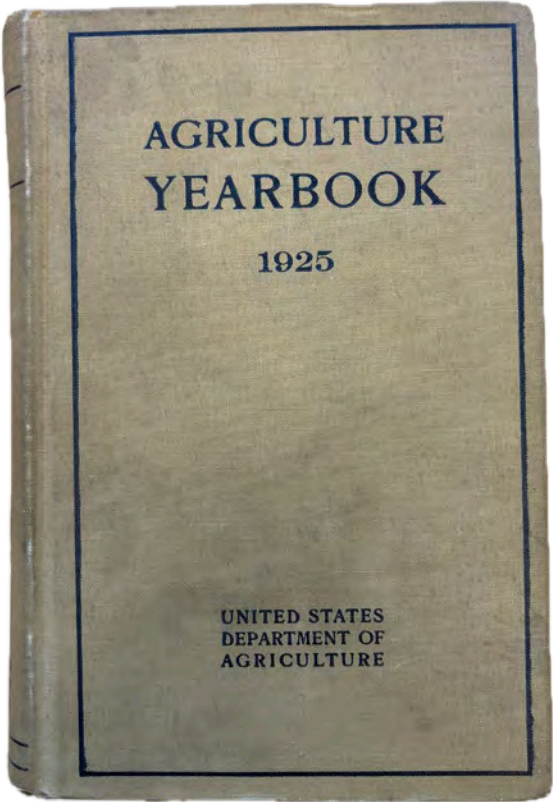
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History of Forages in Minnesota

- Alfalfa 100 years ago
 - Which state was the top alfalfa producer in terms of **acreage**?

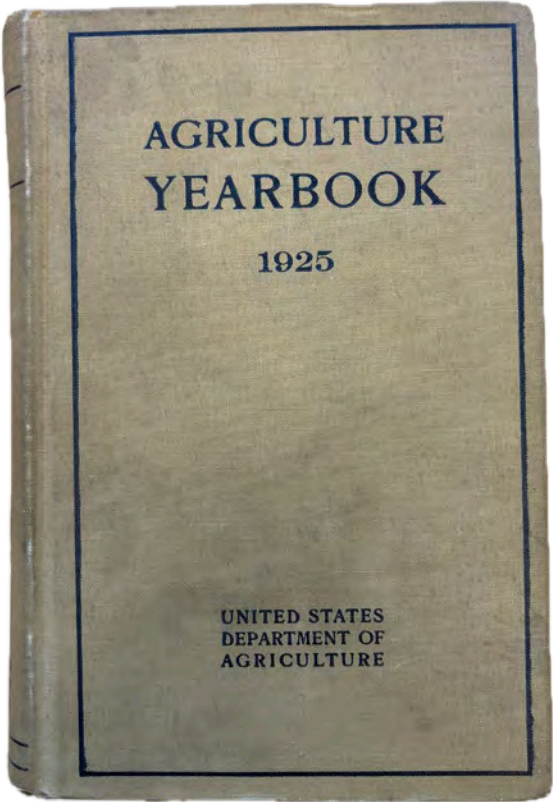
Rank	State	Acres (1000s)
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History of Forages in Minnesota

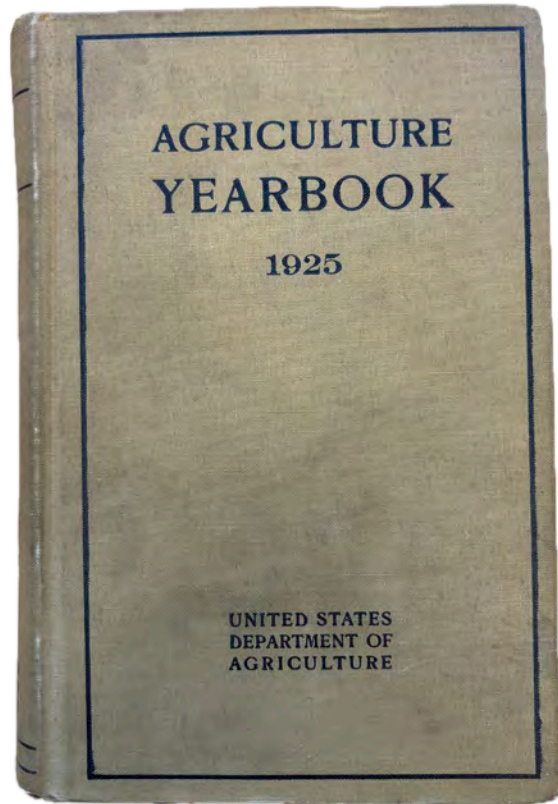
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 - Which state was the top alfalfa producer in terms of **acreage**?

Rank	State	Acres (1000s)
1	Nebraska	1300



History of Forages in Minnesota

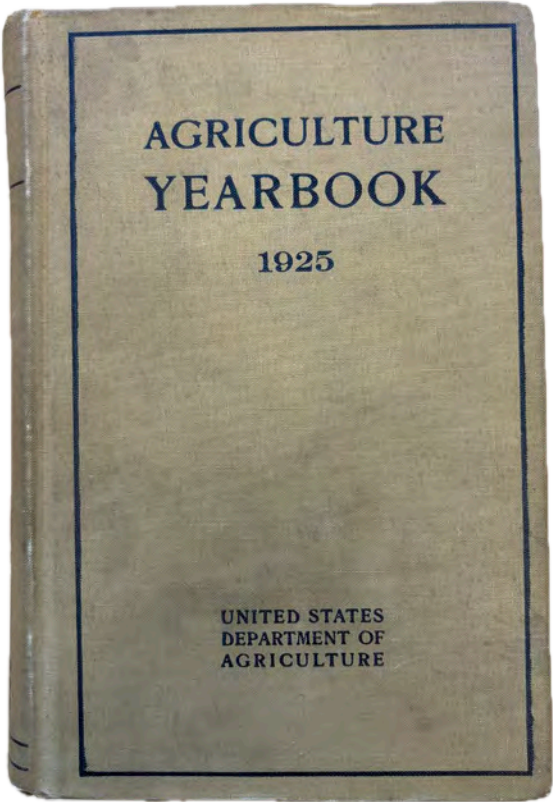
- Alfalfa 100 years ago
 - Which state was the top alfalfa producer in terms of **acreage**?



Rank	State	Acres (1000s)
1	Nebraska	1300
2	Kansas	990
3	California	971
4	Colorado	870
5	S. Dakota	754
6	Idaho	709
7	Montana	604
8	Utah	495
9	Wyoming	400
10	Michigan	392
11	Minnesota	330
12	Wisconsin	310

History of Forages in Minnesota

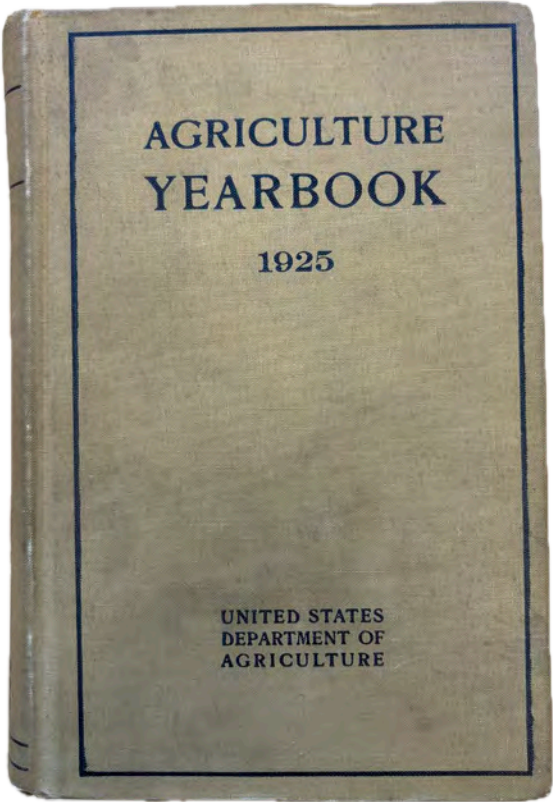
- Alfalfa 100 years ago
 - Which state was the top **yielder**?



Rank	State	Yield (t/acre)

History of Forages in Minnesota

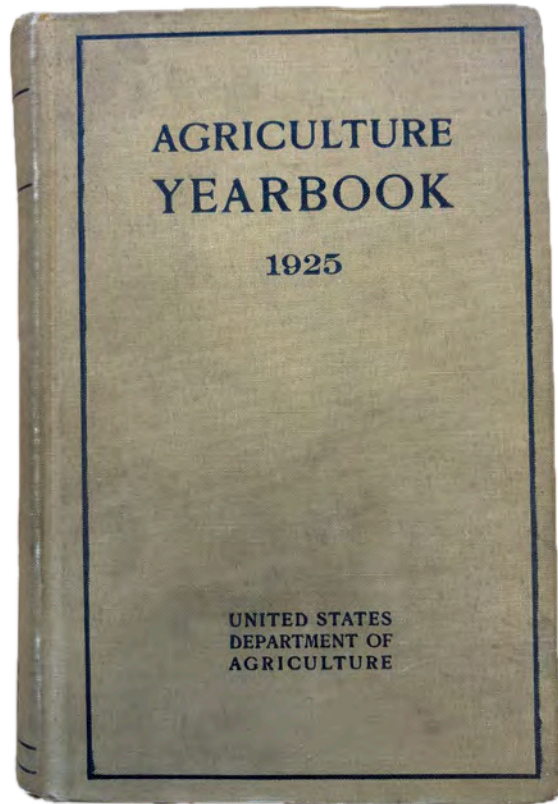
- Alfalfa 100 years ago
 - Which state was the top **yielder**?



Rank	State	Yield (t/acre)
1	California	4.2

History of Forages in Minnesota

- Alfalfa 100 years ago
 - Which state was the top **yielder**?



Rank	State	Yield (t/acre)
1	California	4.2
2	Idaho	3.8
3	Utah	3.5
4	Minnesota	2.75
5	Wisconsin	2.65
6	Nebraska	2.32
7	Colorado	2.3
8	Kansas	2.28
9	Wyoming	2.2
10	Michigan	2.05
11	Montana	2
12	S. Dakota	1.43

History of Forages in Minnesota

- Alfalfa today (2025 statistics)

Rank	State	Acres (1000s)
1	S. Dakota	1490
2	Montana	1400
3	N. Dakota	1290
4	Idaho	870
5	Nebraska	865
6	Minnesota	760
7	Iowa	720
8	Wisconsin	710
9	Colorado	620
10	Michigan	550
11	Wyoming	500
12	Kansas	490

History of Forages in Minnesota

- Alfalfa today - (2025 statistics)
data includes irrigated acres

Rank	State	Yield (t/acre)
1	Arizona	7.4
2	California	6.8
3	Washington	5
4	Nevada	4.7
5	Oregon	4.7
6	Utah	4.3
7	Iowa	4.2
8	New Mexico	4.2
9	Idaho	4.1
10	Maryland	4
11	Wisconsin	3.9
12	Colorado	3.8
13	Minnesota	3.75

UMN/USDA Collaborations Continue

Recent collaborations to advance alfalfa and other perennial forages



UMN/USDA Collaborations Continue

RALLF – Roots, Alfalfa, Low-Lignin Forage

- Led by Dr. Josh Gamble
- Objective – determine the effect of cultivar and harvest frequency on root turnover

Plant and Soil 185: 281–291, 1996.

© 1996 Kluwer Academic Publishers. Printed in the Netherlands.

Fine root demography in alfalfa (*Medicago sativa* L.)

Gregory D. Goins¹ and Michael P. Russelle²

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UMN/USDA Collaborations Continue

RALLF – Roots, Alfalfa, Low-Lignin Forage

Root Ingrowth Core



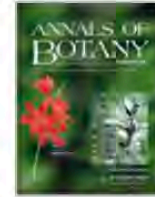
UMN/USDA Collaborations Continue

- DASS – Digestibility of Alfalfa Stem Segments
 - Led by Dr. Jo Heuschele and Dr. Hannah Rusch
 - Objective: Better understand the developmental patterns of alfalfa lignification and cell wall composition in relation to in vitro neutral detergent fiber digestion



Annals of Botany

Volume 82, Issue 5, November 1998, Pages 561-568



Regular article

Alfalfa Stem Tissues: Cell-wall Development and Lignification ☆

F.M ENGELS^{a f1}, H.G JUNG^{b f2}



Dr. Hannah Rusch

UMN/USDA Collaborations Continue

Beyond Alfalfa – Studying the carbon footprint of perennial forage systems

2020	2021	2022	2023	2024	2025
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Perennial Field



Annual Field



Dr. Jake Kundert

UMN/USDA Collaborations Continue

2020	2021	2022	2023	2024	2025
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Perennial Field

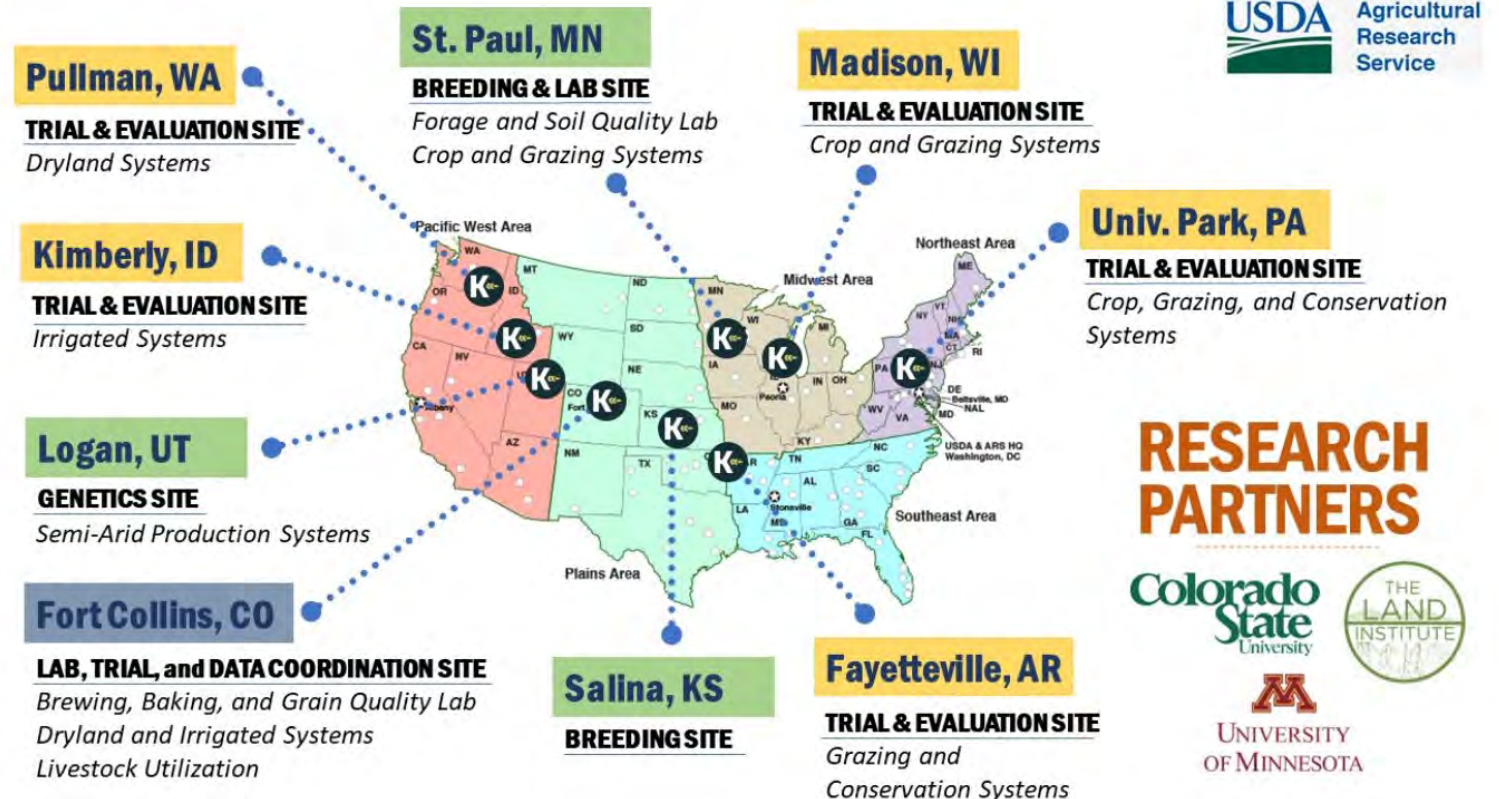
Alfalfa

Kernza



National ARS Collaborations – Kernza Initiative

- IWG (Kernza) as dual-use crop
- Come and see these plots on Friday!



Other Collaborative Forage Research

- Kernza and alfalfa mixtures – ASAFS with Cornell (Dr. Ginny Moore) and USDA Dairy Forage Unit (Dr. Heathcliffe Riday)



Other Collaborative Forage Research

- Kernza and alfalfa mixtures – ASAFS with Cornell (Dr. Ginny Moore) and USDA Dairy Forage Unit (Dr. Heathcliffe Riday)
- NIFA Projects exploring Kernza alfalfa and red clover mixtures



Future work

- Enhancing alfalfa winter survival
 - UMN welcomes a new Forage Research and Extension Faculty Dr. Beatriz Cremostim



Dr. Beatriz Cremostim

Enjoy the conference!

