Ethiopian Agricultural Research: Challenges and Opportunities

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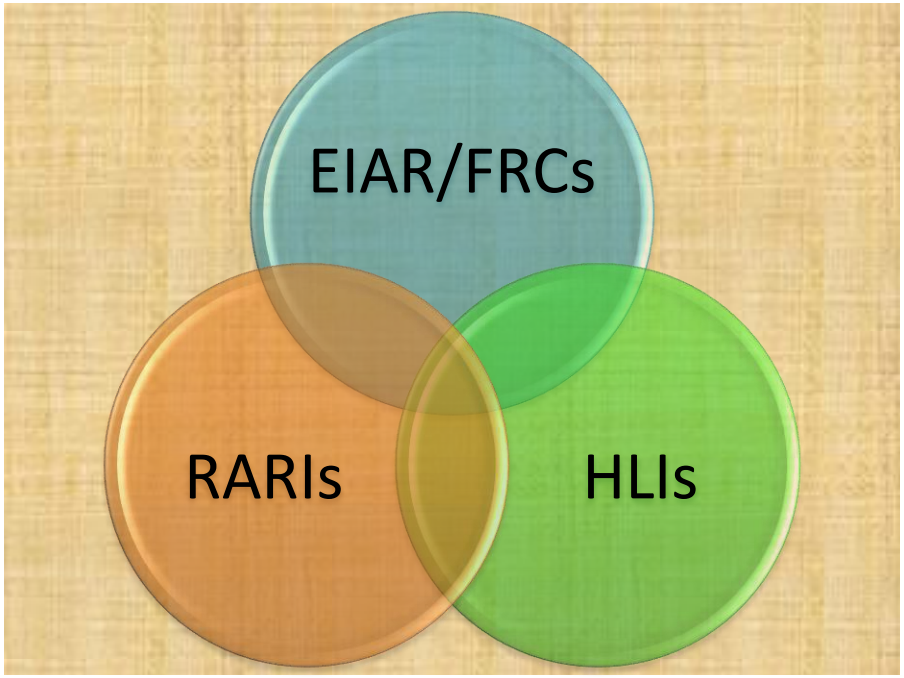
National Agricultural Research System (NARS)

Others:

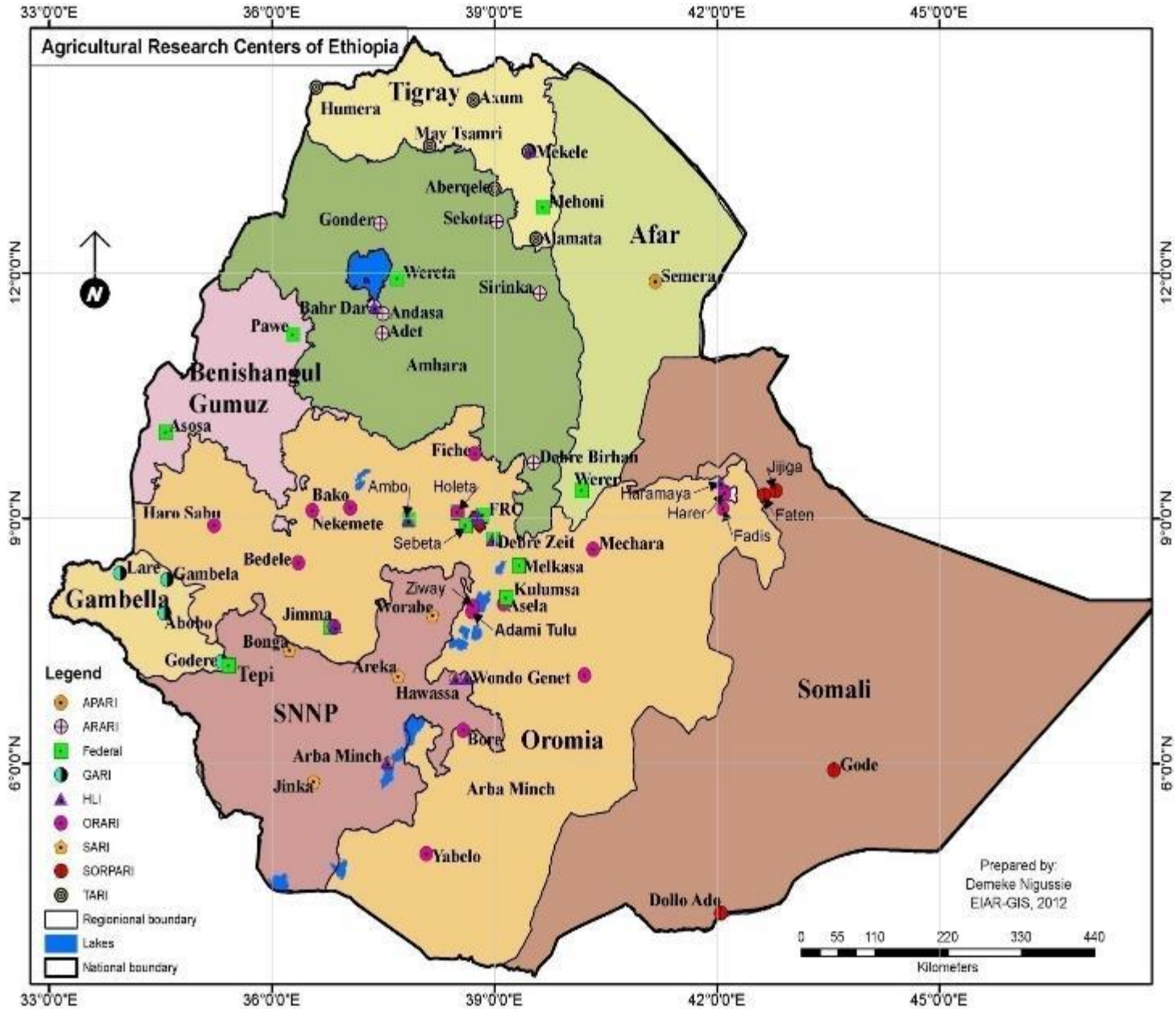
- Sugar
- Industry
- Health
- Water
- Forestry
- etc



Private?

IARs/CGIARs/- 11

Institutional Set up of EARS



Distribution of Research centers

Mandate: Triple functions

Generating agricultural technologies, knowledge and Information

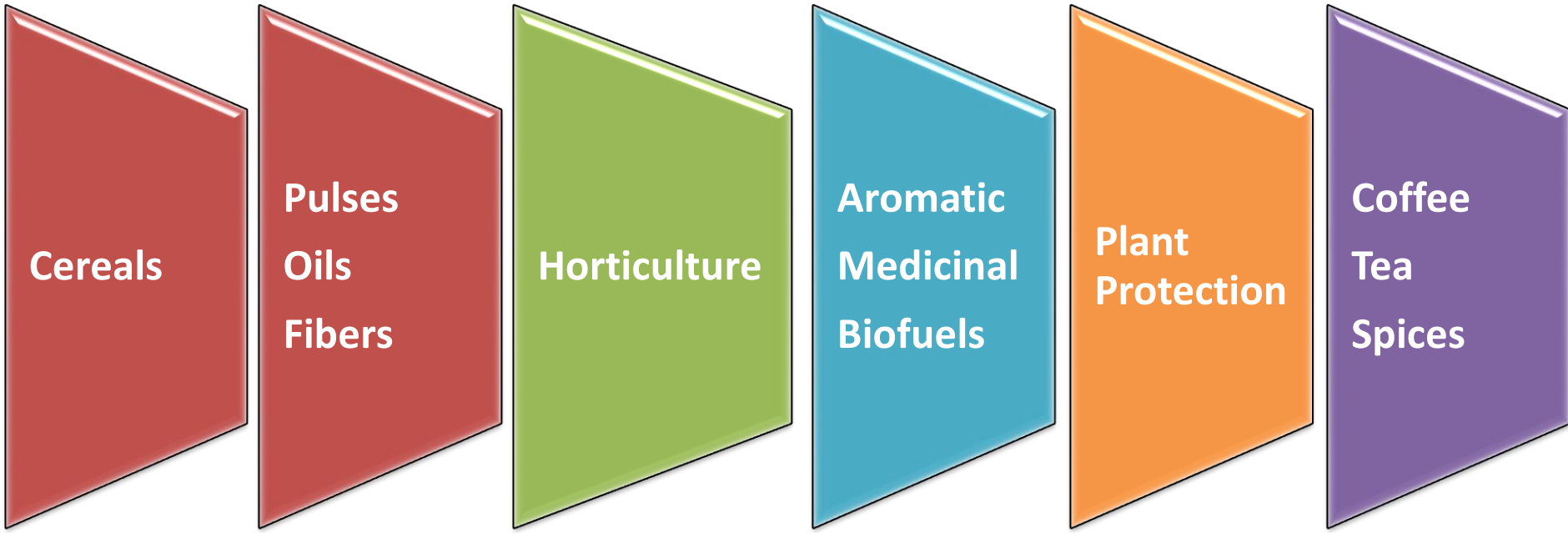
Popularization of improved technologies; capacity building

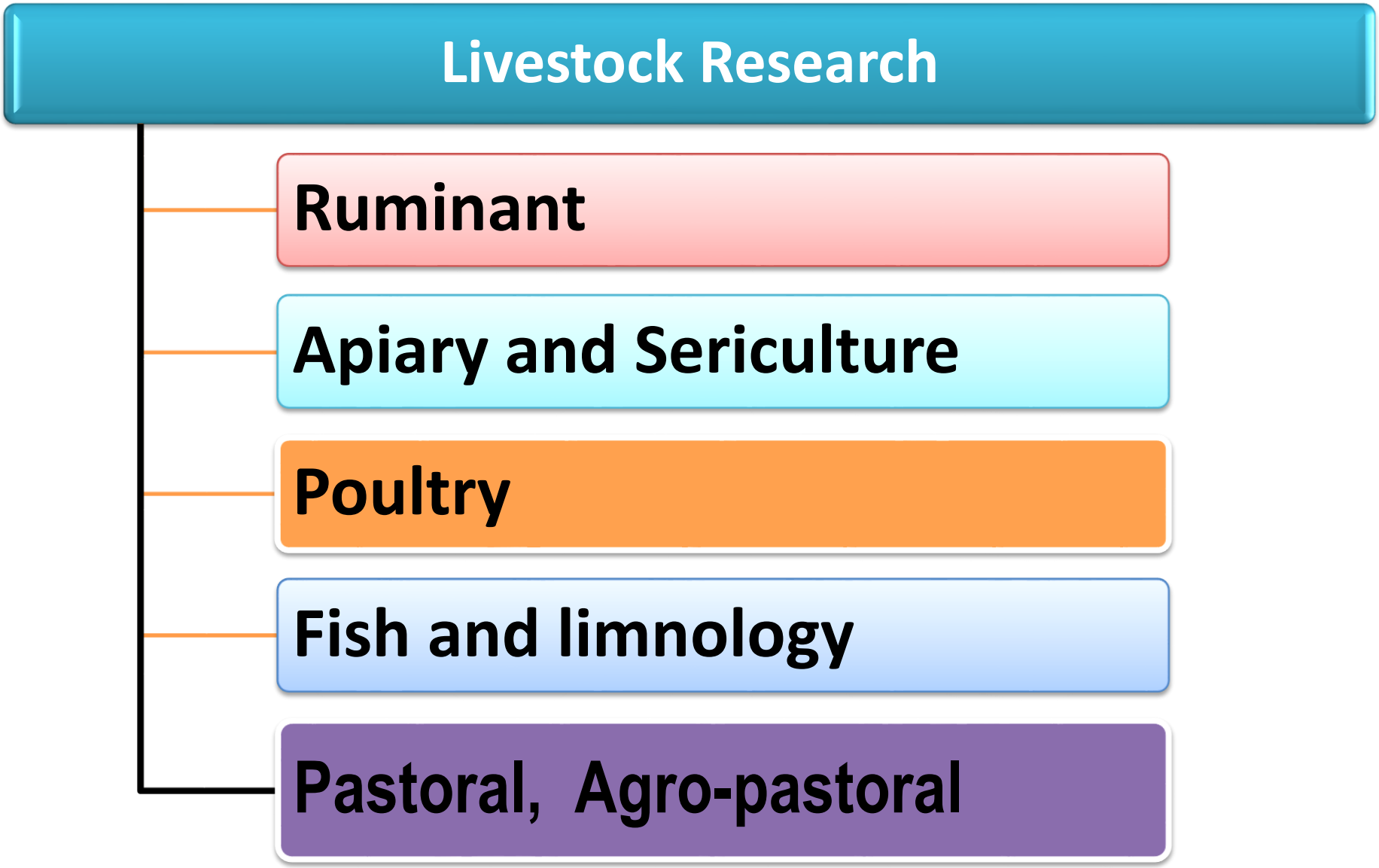
Maintenance, multiplication and provision of source technologies

Major Research Areas

- **Crop**
- **Livestock**
- **Land &Water**
- **Forestry**
- **Mechanization**
- Biotechnology
- Seed
- Climate/Agro-metreology
- Agric.Economics/Extension/Gender
- Nutrition/quality

Crop Research



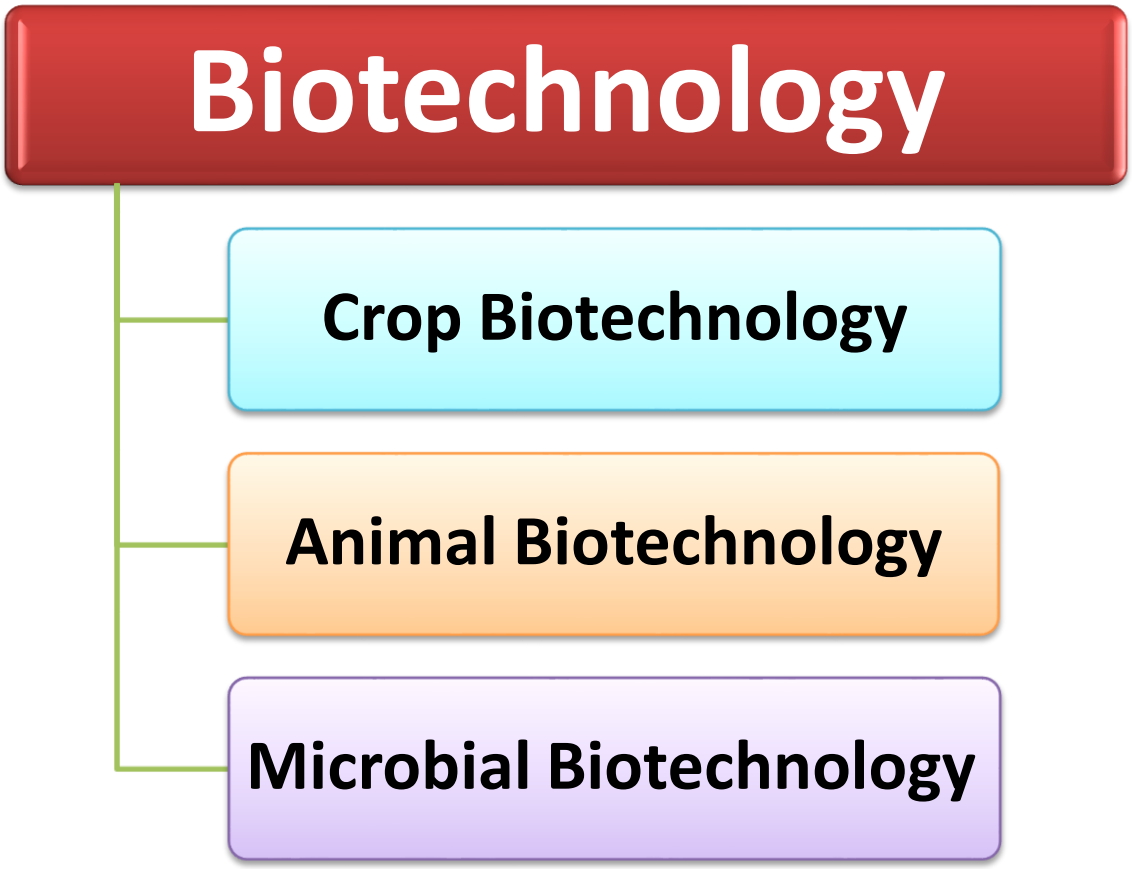

Livestock Research
Ruminant
Apiary and Sericulture
Poultry
Fish and limnology
Pastoral, Agro-pastoral

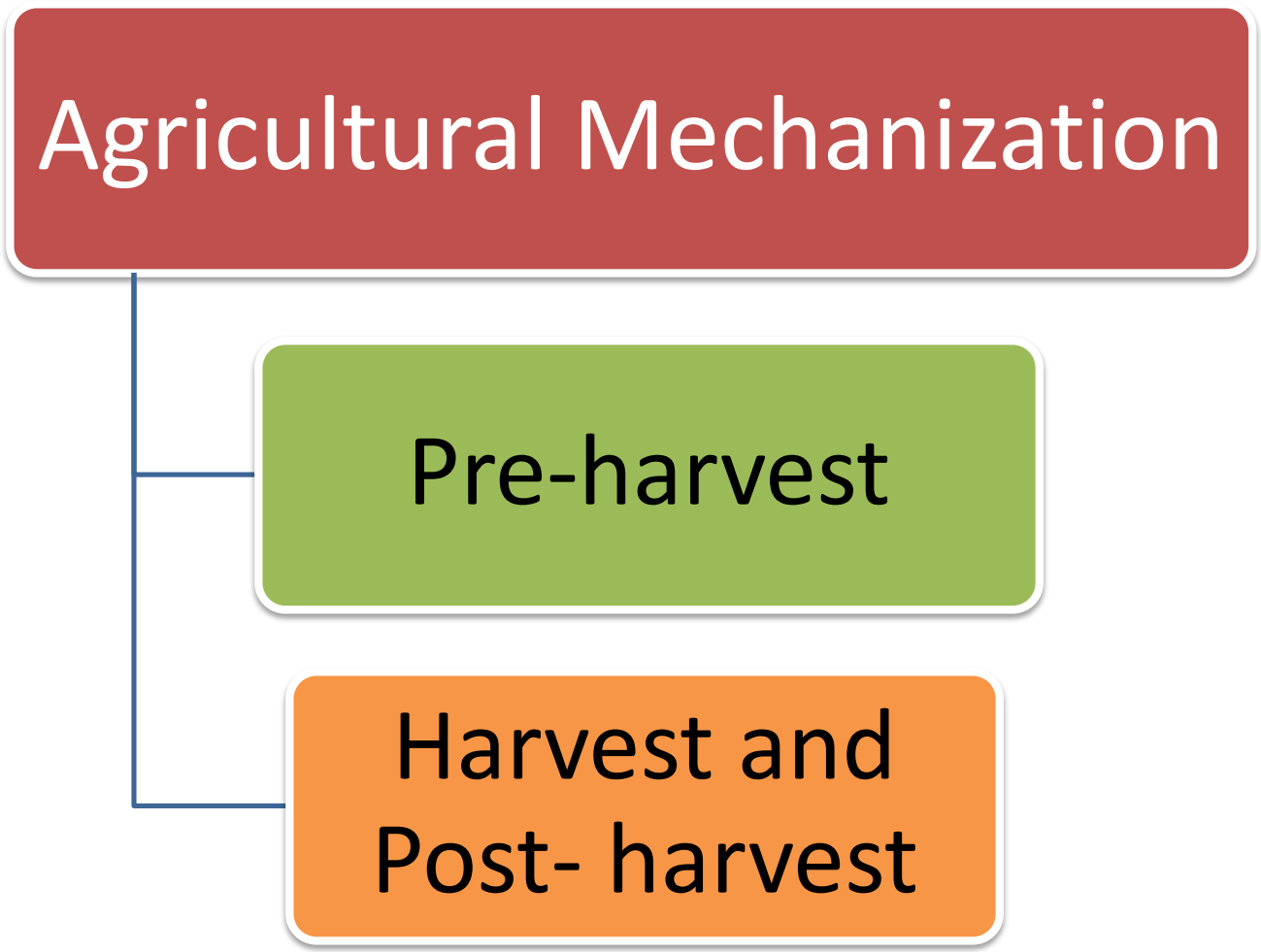
Land And water

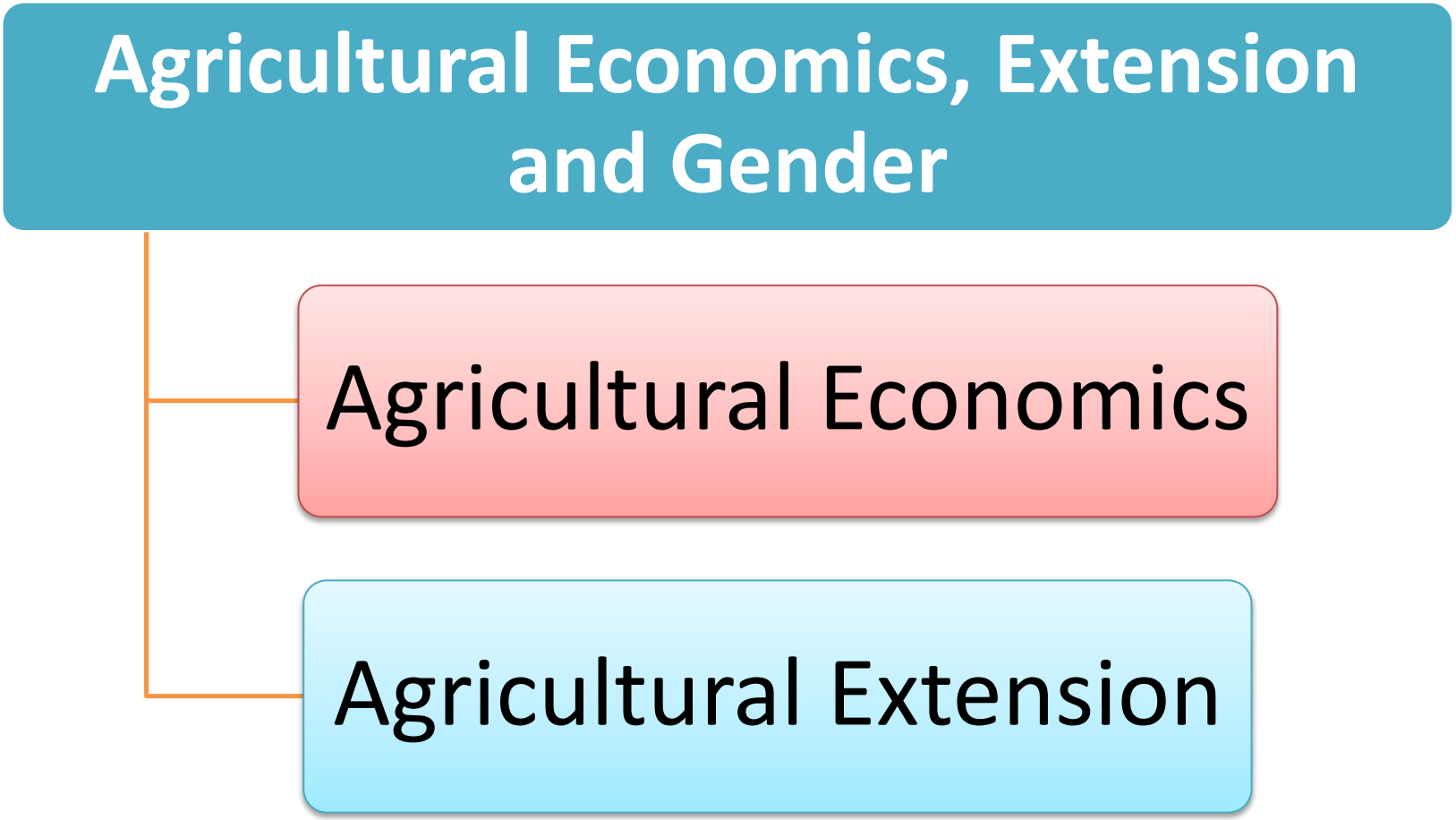
- Integrated Soil fertility and Crop management
- Agricultural water and Saline Soil Management
- Acid soils and Vertisols Management
- Integrated Watershed Management

Forestry

- **Plantation forest**
- **Natural forest**
- **Non-timber Forest Products**
- **Agro forestry**


Biotechnology
Crop Biotechnology
Animal Biotechnology
Microbial Biotechnology

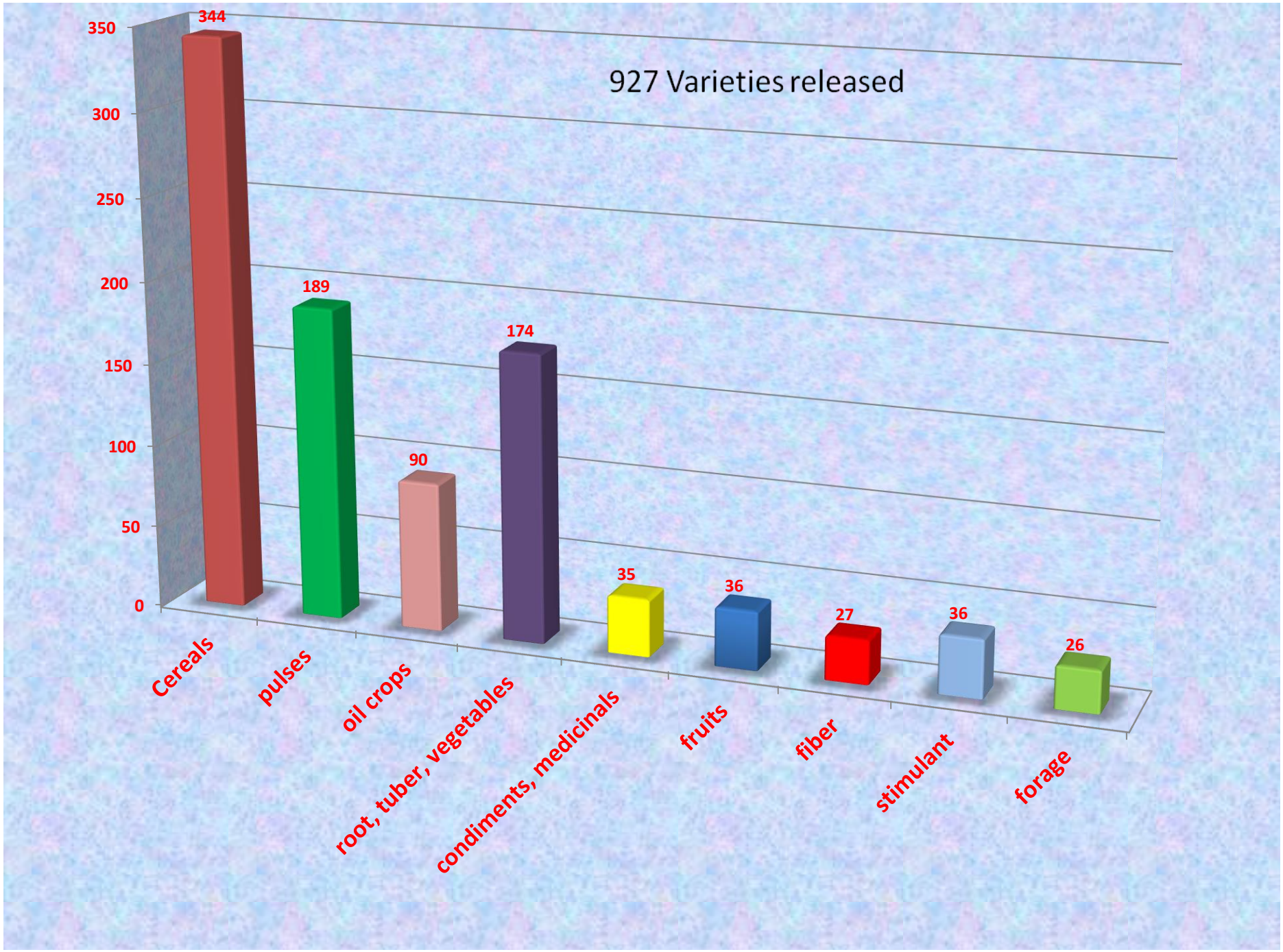

Agricultural Mechanization
Pre-harvest
Harvest and
Post- harvest

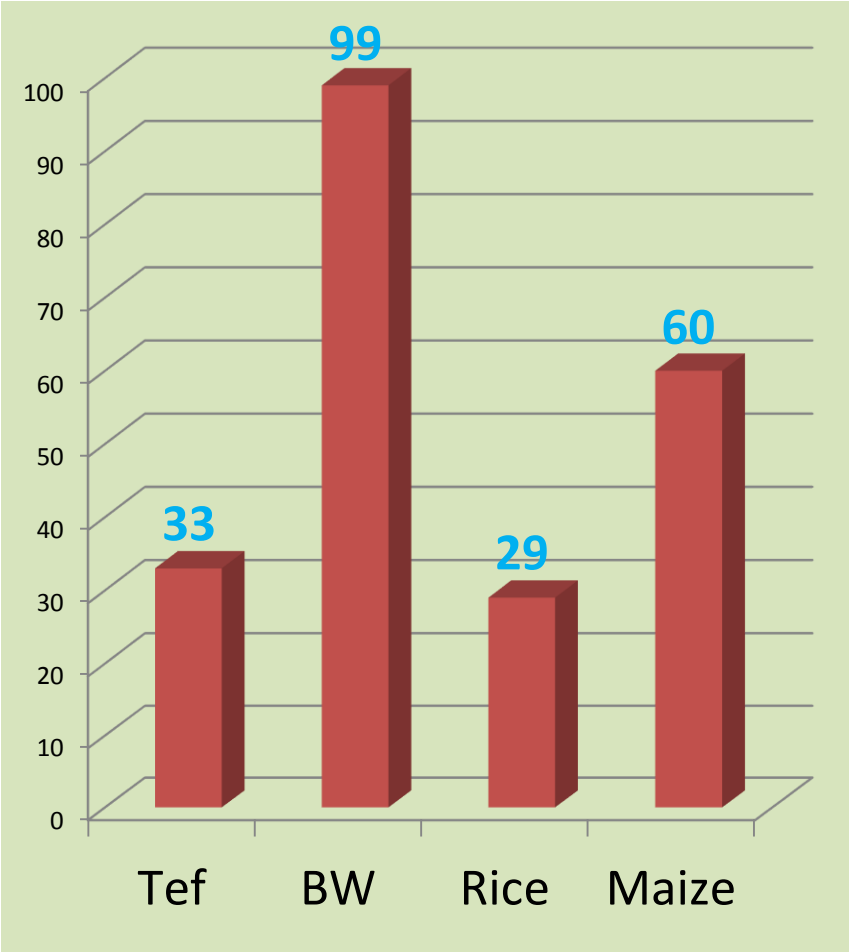

Agricultural Economics, Extension and Gender
Agricultural Economics
Agricultural Extension

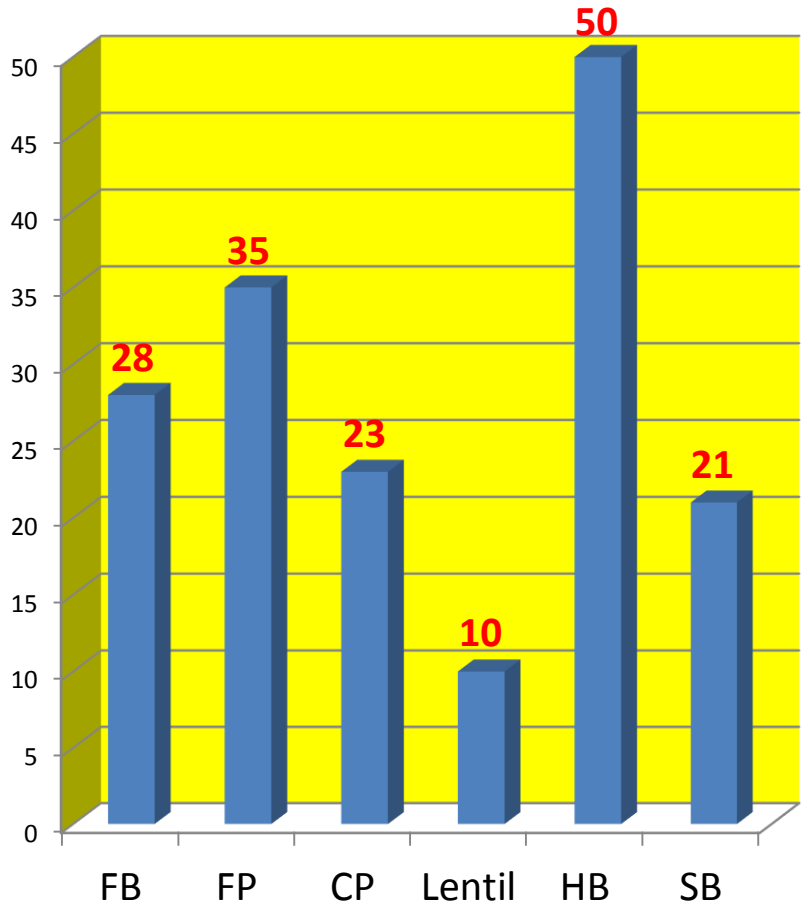
Agricultural and Nutrition Research Laboratories

- Nutrition and Agricultural Products Protocol Synthesis
- Chemical Analysis and Agricultural Chemistry
- Agricultural Biological agents

Some of the achievements registered


927 Varieties released
350
300
250
200
150
100
50
0
344
189
90
174
35
36
27
36
26
Cereals
pulses
oil crops
root, tuber, vegetables
condiments, medicinals
fruits
fiber
stimulant
forage


99
100
90
80
70
60
50
40
30
20
10
0
33
29
60
Tef
BW
Rice
Maize


50
50
45
40
35
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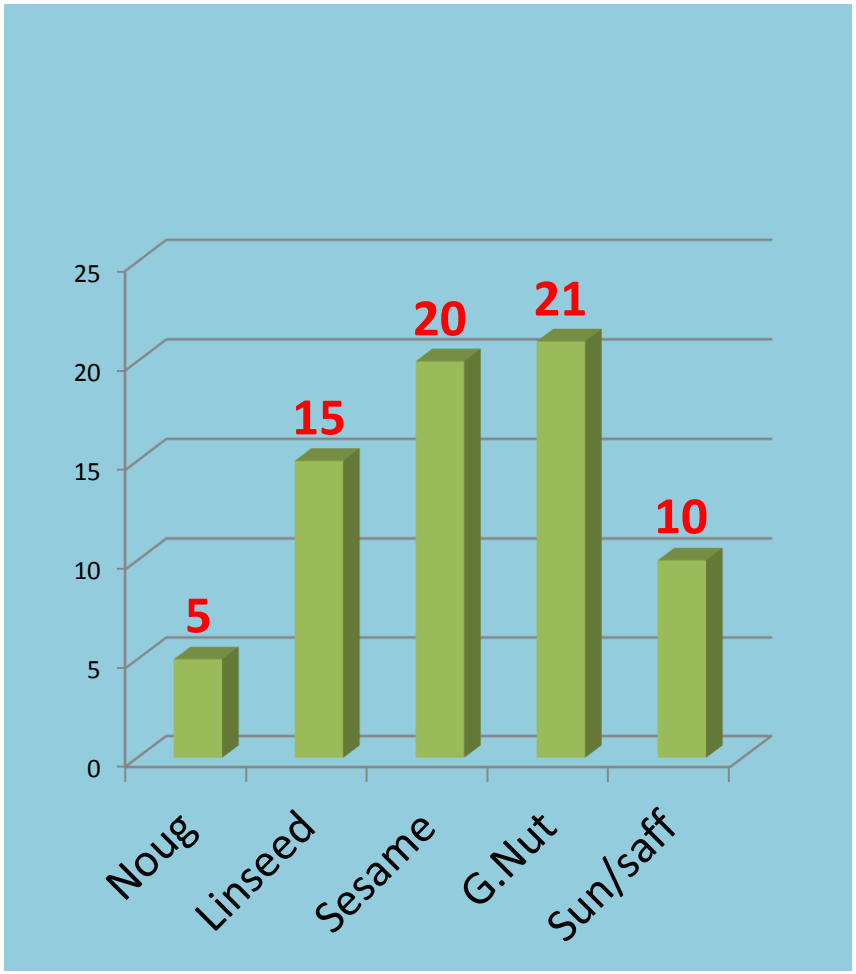
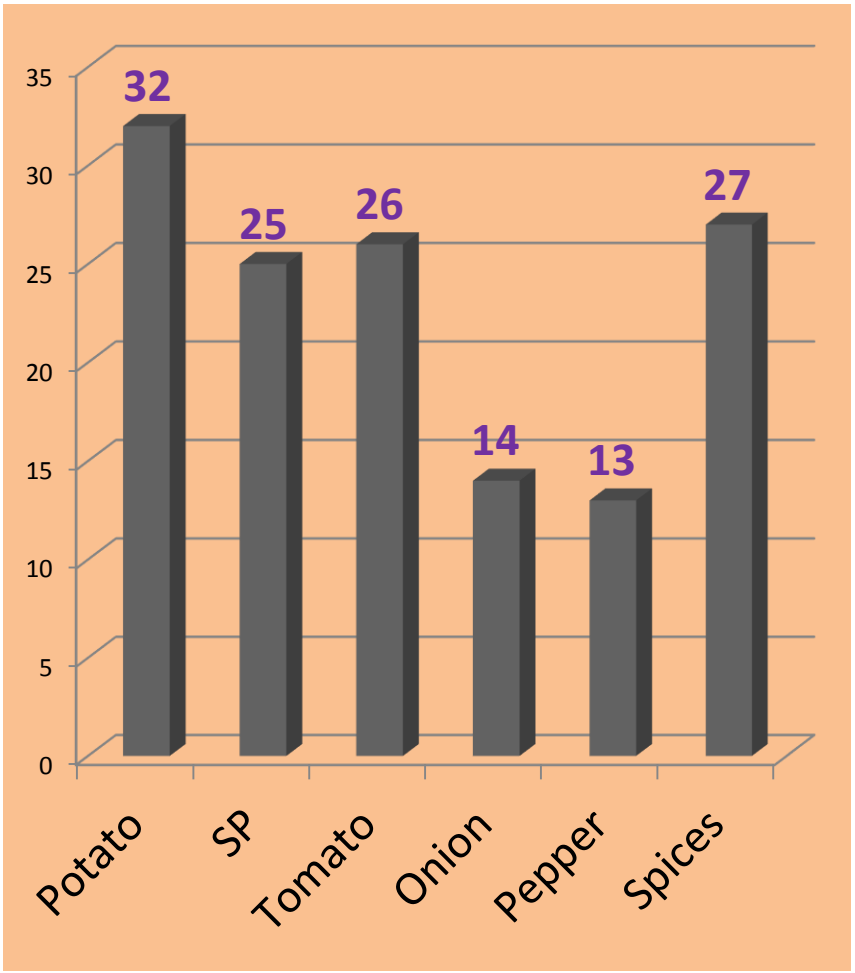
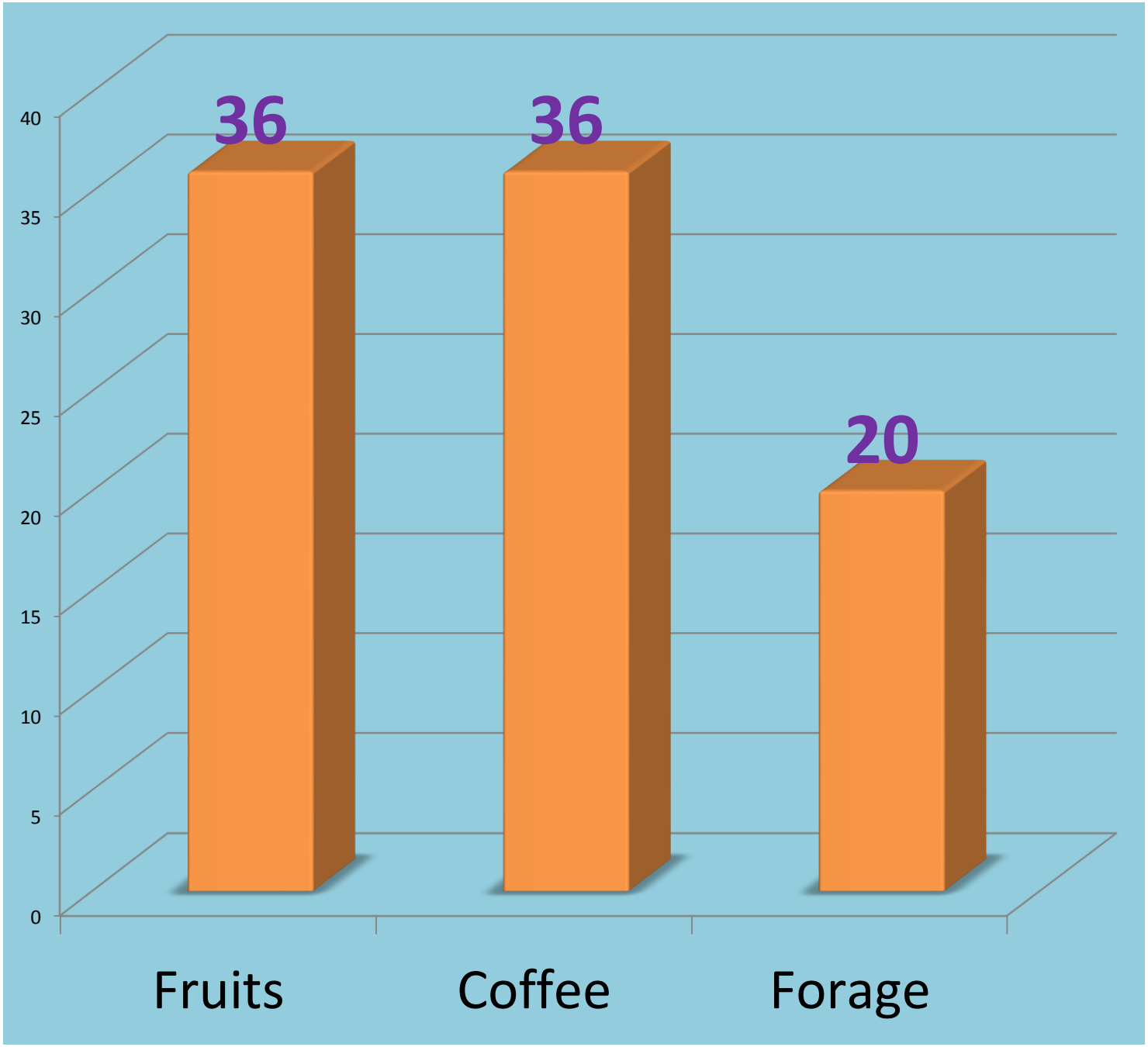
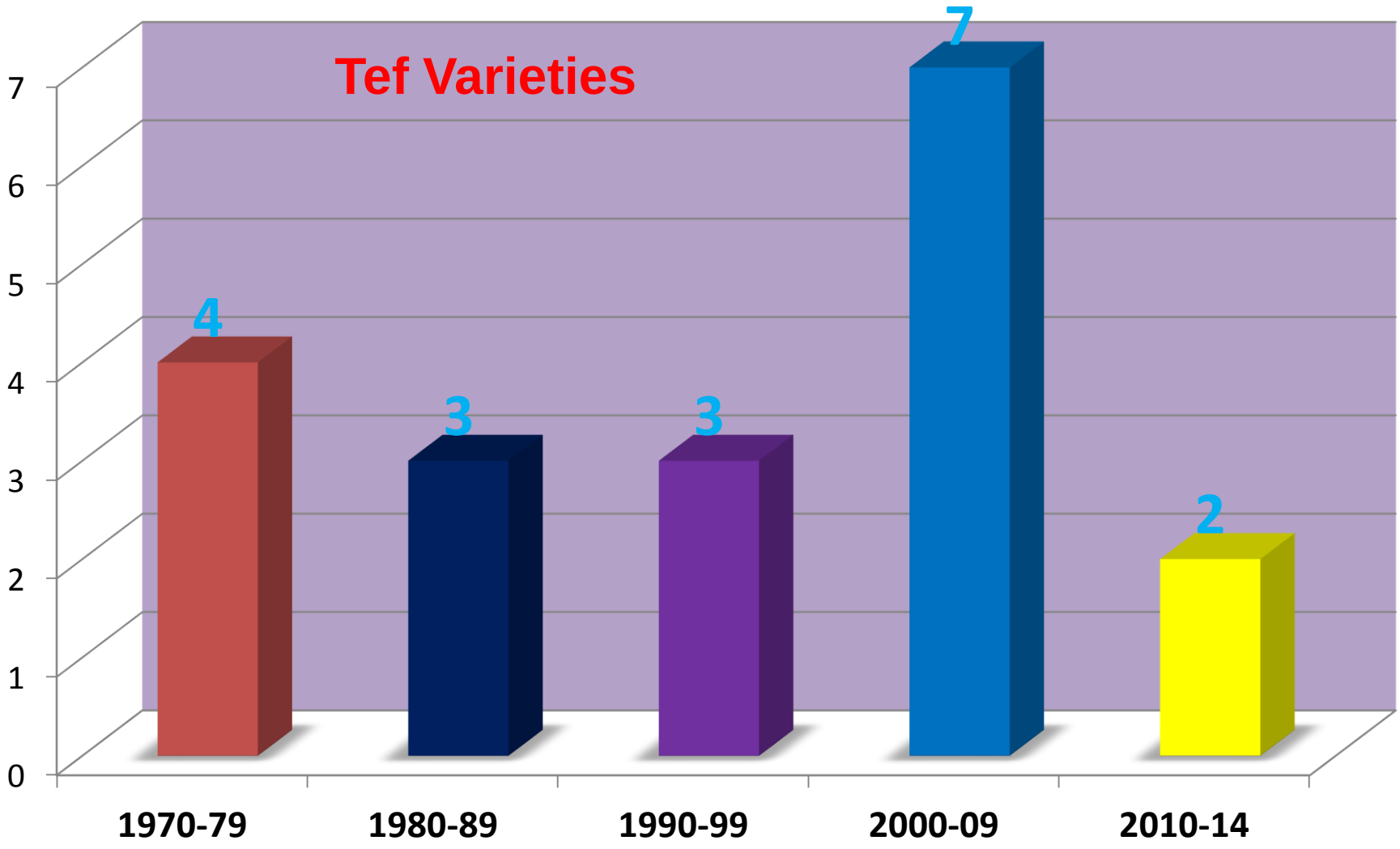
20
15
10
5
0
28
35
23
10
21
FB
FP
CP
Lentil
HB
SB


25
20
15
10
5
0
5
15
20
21
10
Noug
Linseed
Sesame
G.Nut
Sun/saff

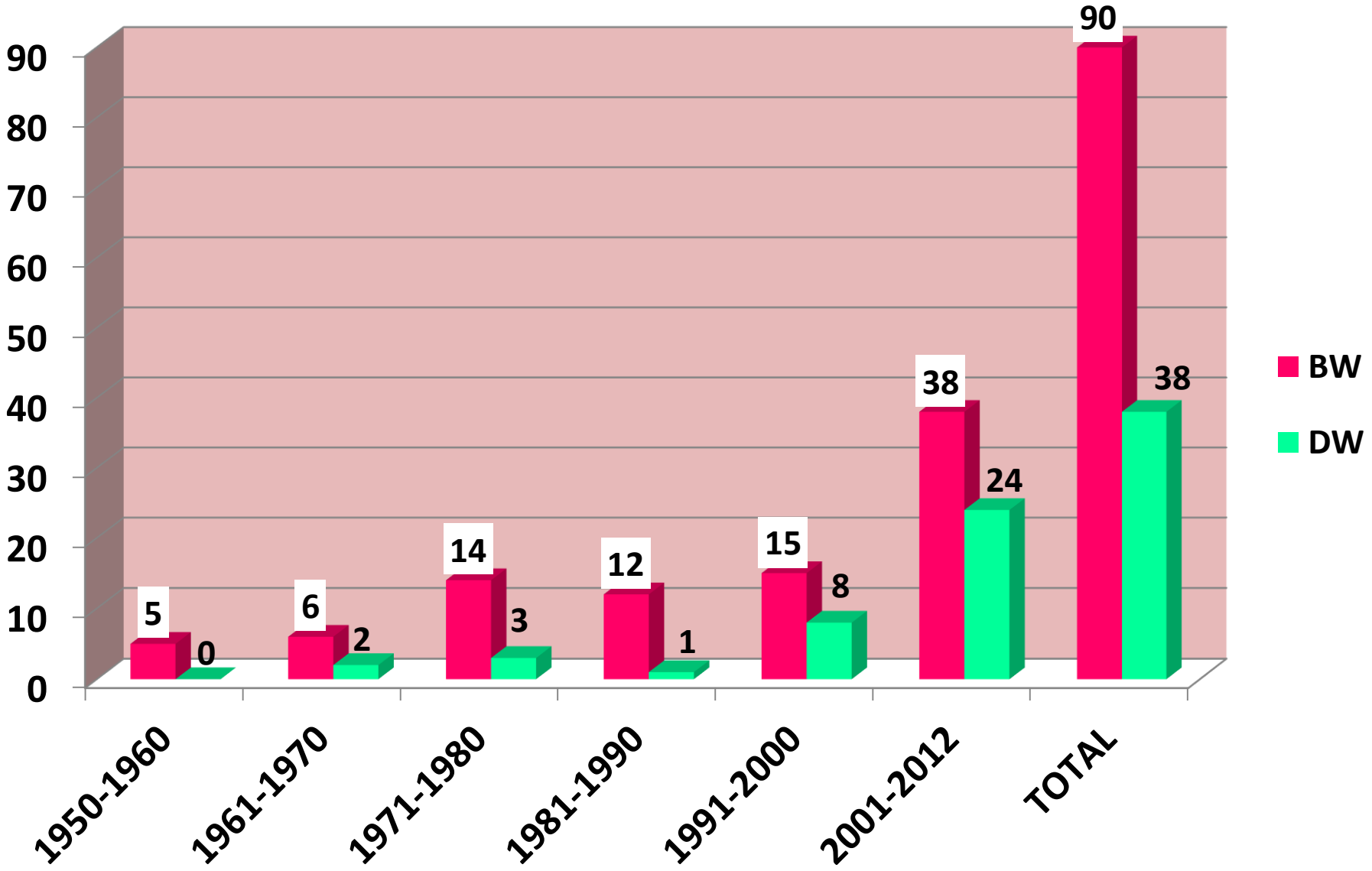

35
30
25
20
15
10
5
0
32
25
26
14
13
27
Potato
SP
Tomato
Onion
Pepper
Spices


40
35
30
25
20
15
10
5
0
36
36
20
Fruits
Coffee
Forage

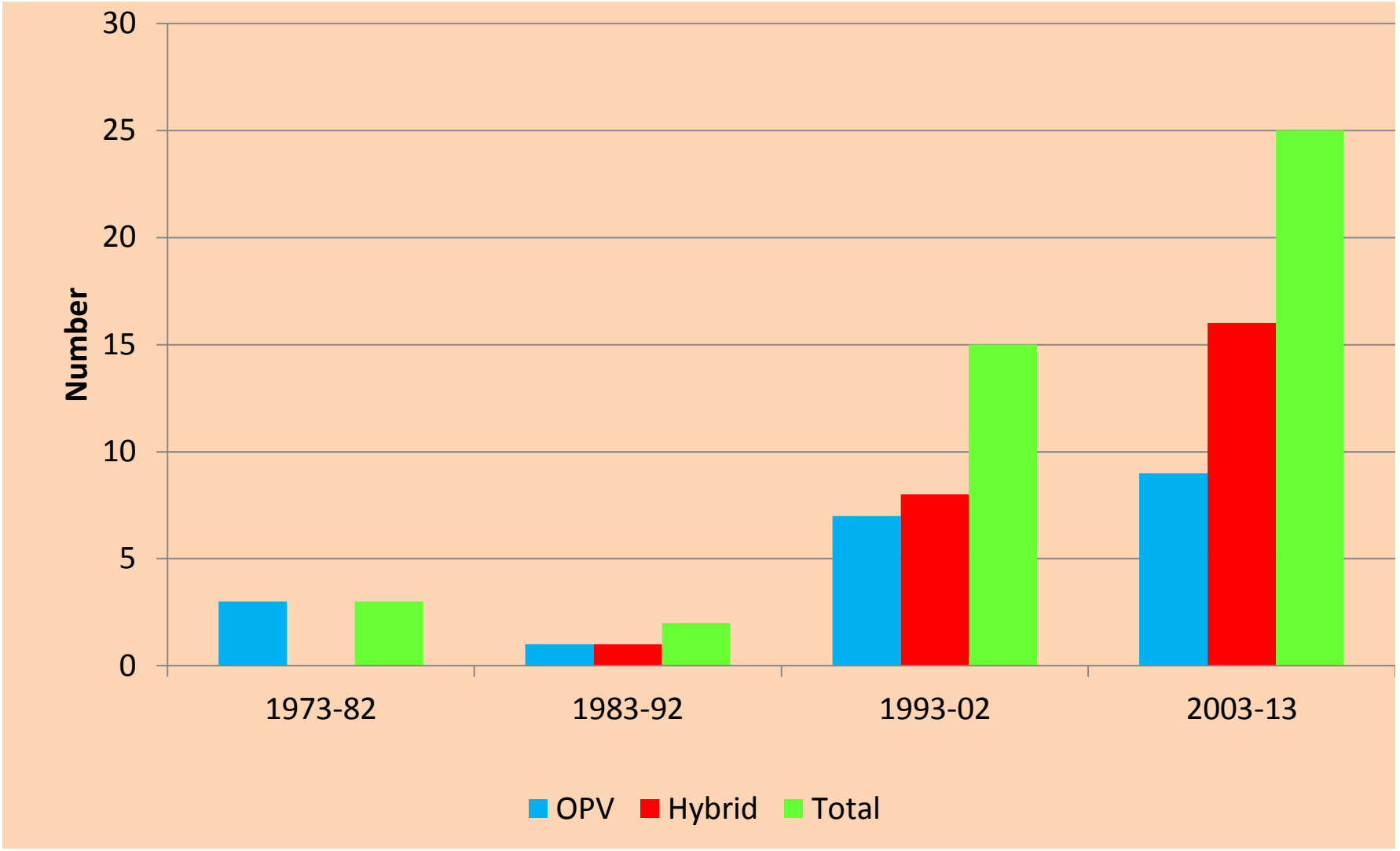
- Mid and high altitude areas with adequate moisture: 11
- Terminal drought prone lowland areas: 7



Wheat varieties (until 2012)



Maize varieties released in Ethiopia

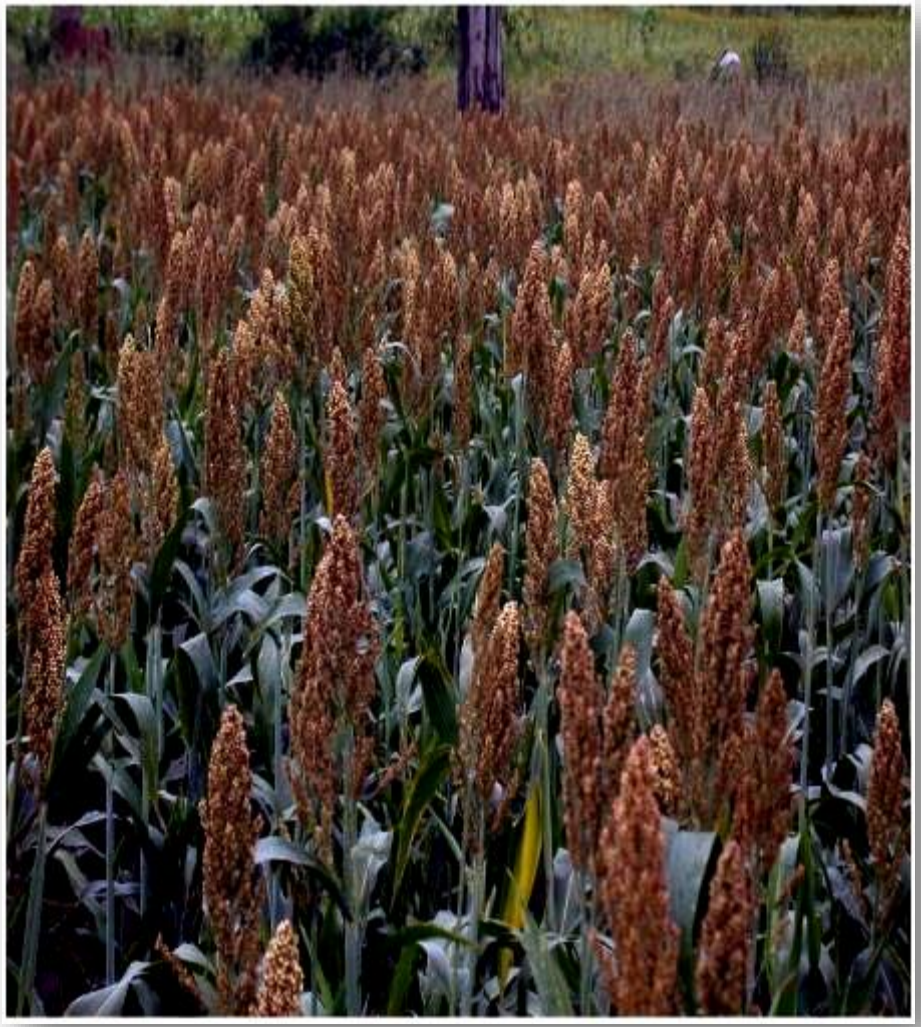



Maize Hybrids
Ops
Mid elevation
High elevation
Drought
QPM

Sorghum

- 40 varieties released
- Hybrids
- Striga resistant
- Malt

Striga free Vs affected




36 food barley
16 malt barley


Upland = 15; Irrigated = 7; Lowland= 5


More than 23 varieties


More than 10 varieties

- 32 varieties
- Average yield= 80-100q/ha
- Improved varieties = 500 q/ha

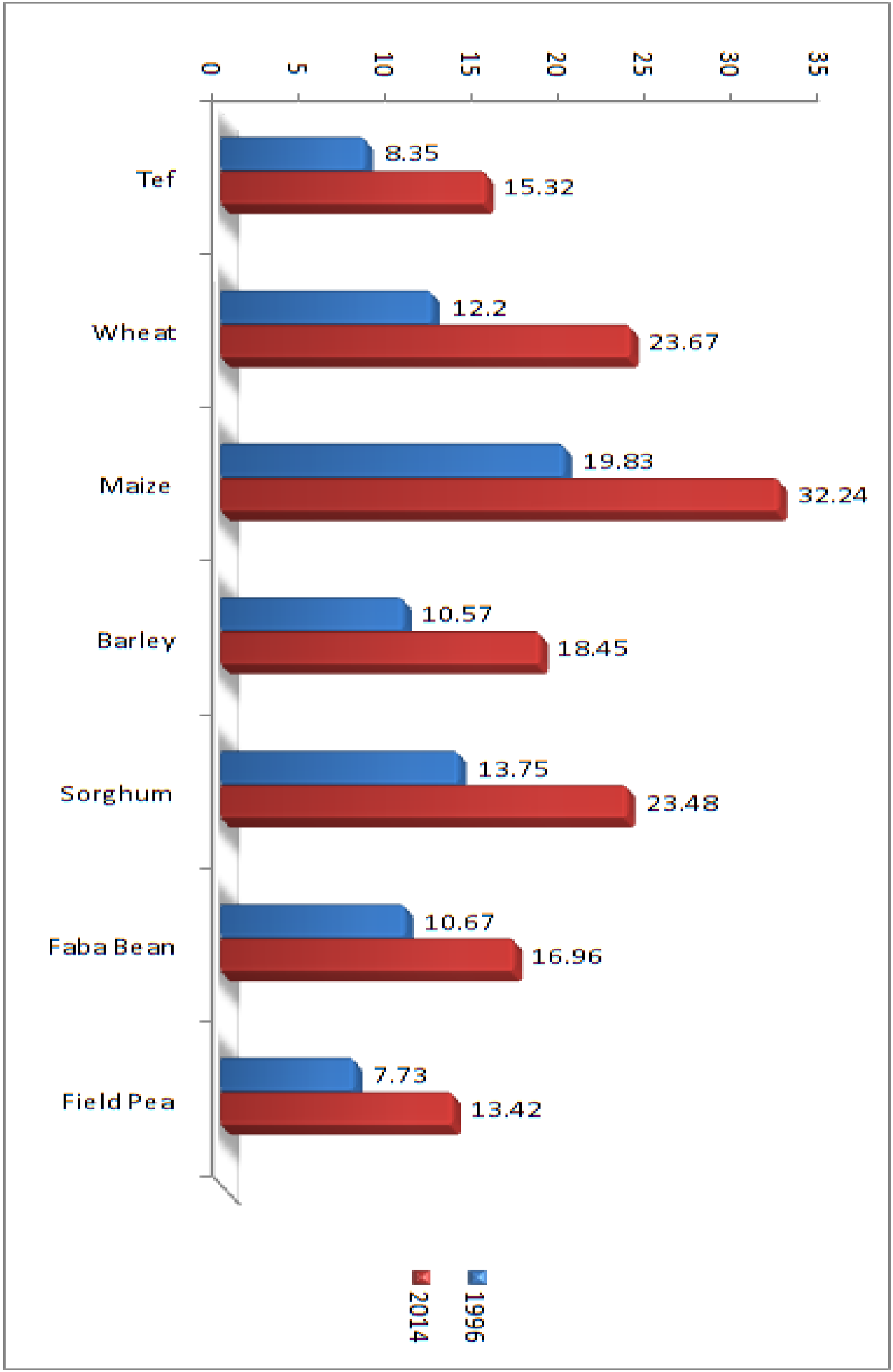
Coffee

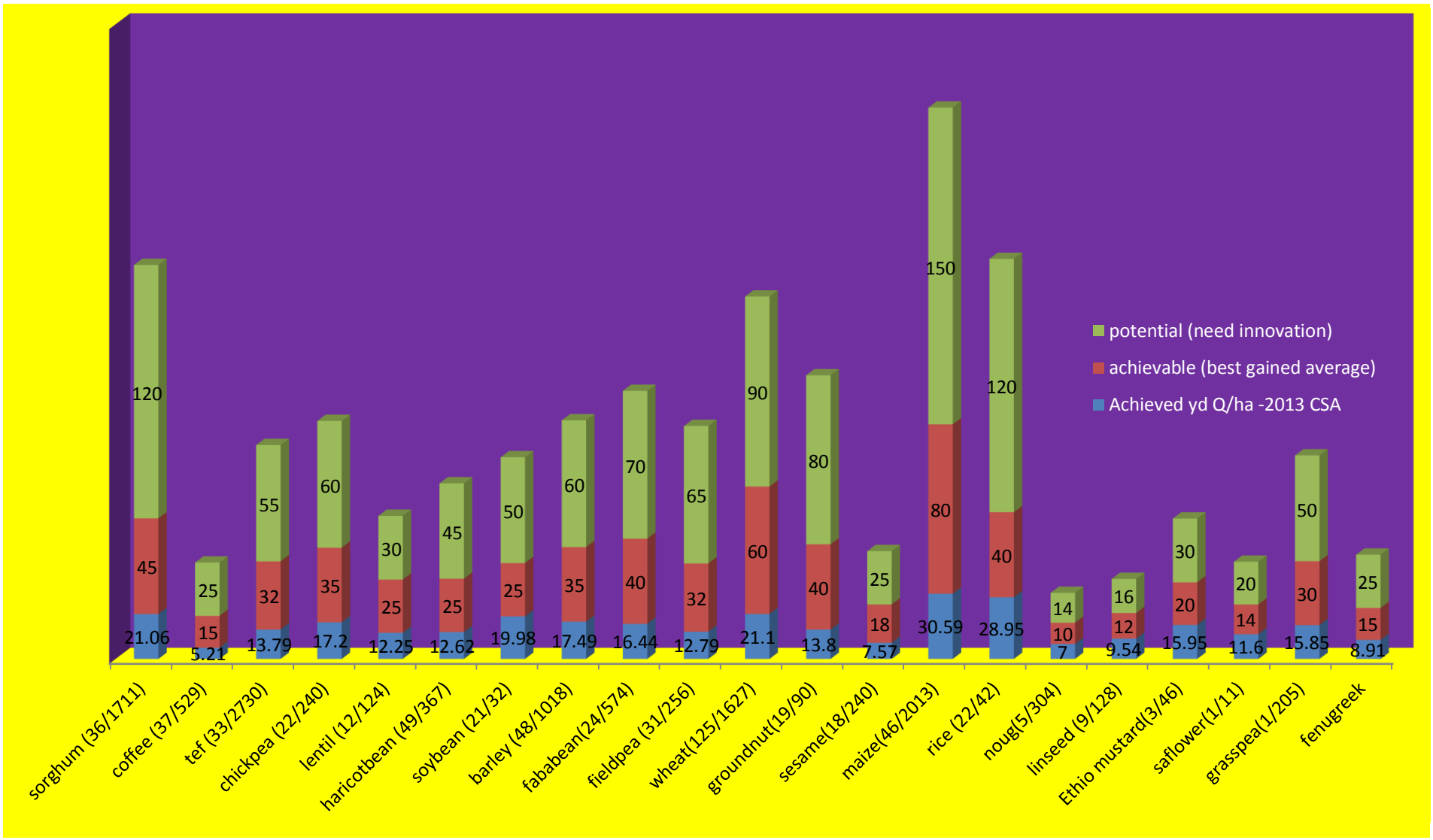
37 varieties

- 23 selection
- 3 hybrids; 39-70%
- 11 specialty
- 12731 germplasm

12-26q/ha

6-7 q/ha average


0
5
10
15
20
25
30
35
Tef
8.35
15.32
Wheat
12.2
23.67
Maize
19.83
32.24
Barley
10.57
18.45
Sorghum
13.75
23.48
Faba Bean
10.67
16.96
Field Pea
7.73
13.42
2014
1996


potential (need innovation)
achievable (best gained average)
Achieved yd Q/ha -2013 CSA
sorghum (36/1711)
coffee (37/529)
tef (33/2730)
chickpea (22/240)
lentil (12/124)
haricotbean (49/367)
soybean (21/32)
barley (48/1018)
fababean(24/574)
fieldpea (31/256)
wheat(125/1627)
groundnut(19/90)
sesame(18/240)
maize(46/2013)
rice (22/42)
noug(5/304)
linseed (9/128)
Ethio mustard(3/46)
saflower(1/11)
grasspea(1/205)
fenugreek
120
45
21.06
25
15
5.21
55
32
13.79
60
35
17.2
30
25
12.25
45
25
12.62
50
25
19.98
60
35
17.49
70
40
16.44
65
32
12.79
90
60
21.1
80
40
13.8
25
18
7.57
150
80
30.59
120
40
28.95
14
10
7
16
12
9.54
30
20
15.95
20
14
11.6
50
30
15.85
25
15
8.91

Livestock- dairy

Improved crossbred dairy cattle: Frisian & Jersey

- F1 (50%)
- High grade (>75%)

+ production packages

Pure Frisian & Boran

- Feeding strategies to the diff. areas & feed resource types
- Forage production
- Milk processing
- Animal health

Beef cattle

- Feeding management
- Characterization for beef production

Small Ruminants

- Improved management of local breeds
- Feeding packages for the different production systems
- Forage seed crop husbandry
- Cross breeding
  - Dorper sheep
  - Boer Goats

Poultry

- Adaptation of commercial breeds
  - Broilers
  - Layers
  - Dual purpose
- Health management
- Feeding system
- General management practice
- Genetic improvement of local chickens

Fishery

- aquaculture practices
- Fingerling production techniques
- fishing gear technologies
- Preservation practices

Apiculture

- Beehives development
- Bee disease and pest control mechanisms
- Bee forage
- Honey and beeswax processing technologies

Sericulture

- Suitable silkworm races identified
- Silk worm forages varieties and management production practices
- Cocoon production management

Feed production & management

- Forage crops for different agro-ecologies and production strategies
  - 11 registered
  - >25 recommended
  - agronomic, conservation and utilization technologies
- utilization of crop residues and agro-industrial by products

Land and Soil

- Fertilizer recommendations
- Biofertilizers
- Cropping systems
- Irrigation water management
- Acid and vertisol management

crop rotation

Bio-fertilizer

Acid soil management

Mechanization

Erf' and 'Mofer' Attached Moldboard Plough

Tie-Ridger

Winged Plough/Sweep

Sub-soiler

Hand Metered Row Planter

Groundnut Lifter/Potato Digger

MARC Enset Decorticator

IAR Multi-Crop Thresher

Opportunities

- **Focus accorded to agriculture, Research, S&T**
- **Technology demand is on the rise: Farmers awareness and skill improved; strong extension system**
- **Global knowledge pool- ICT**
- **Regional research initiatives**
- **Availability of IARs-** 11 CGs
- **Institutional growth; Universities- 32**
- **NARS- 65 centers**
- **NARC establishment**
- **University-industry linkage**

Challenges

Technology related:

- **Agricultural constraints are on the rise**
- **High yielding and quality varieties**
- **Technologies for agro-industry, export**
- **Bio-security/insect pest, diseases, weeds**
- **Nutrition security**
- **Technologies for horticulture livestock, post-harvest, Irrigation, NRM, etc.**
- **Biotechnology**
- **Socio-economic, agro-ecosystem, system studies**

Research coverage

- **Unaddressed commodities; Unaddressed AEZs**
- **Less addressed targets/beneficiaries**

Climate change

- **Climate -proof technologies**

Capacity issues

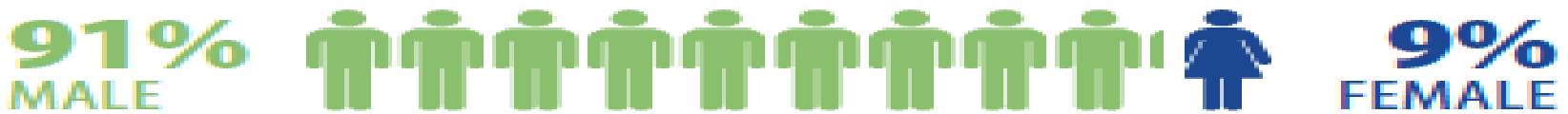
- **Manpower**
- **Field, laboratory equipments and facilities**
- **Finance**

➢ **Technology generation and adaptation capacity**

Strong linkage, coordination, integration

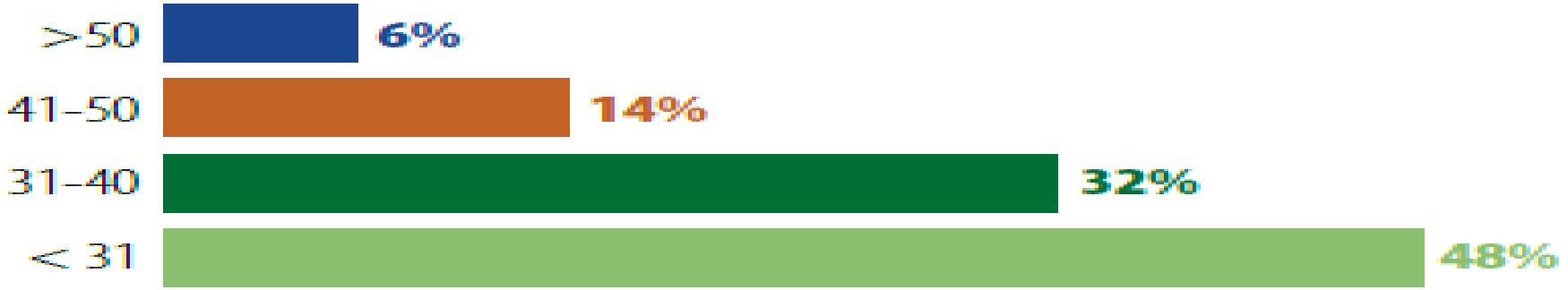
- **Within NARS (federal-regional); with HLI, IARs, industry, etc**

RESEARCHER PROFILE, 2011



Number by qualification (FTEs)

Share by age group (years)



KEY INDICATORS, 2000–2011

Total Public Agricultural Research Spending	2000		2008		2011
Birr (million constant 2005 prices)	107.7		145.4		156.9
PPP dollars (million constant 2005 prices)	47.8		64.5		69.6
Overall Growth		**35%**		**8%**	
Total Number of Public Agricultural Researchers					
Full-time equivalents (FTEs)	743.8		1,410.3		1,876.6
Overall Growth		**90%**		**33%**	
Agricultural Research Intensity					
Spending as a share of agricultural GDP	0.30%		0.24%		0.19%
FTE researchers per 100,000 farmers	3.09		4.68		5.79

CGIAR-EIAR/EARS collaboration

Current areas of NARS-CGIAR collaborations

1. **Research and technology transfer**

- Germplasm enhancement and exchange
- Collaborative research
- Competitive grant; Bilateral projects
- Technical backstopping; Mentoring and skill transfer
- Technology transfer; technology promotion activities
- Source technology multiplication
- Co-publications; co-authorship

2. **Research financing; Resource sharing**
3. **Capacity building**: facilities/ lab. & lab. supplies, cold stores, vehicles, training

challenges

- Not all CGs are active and work with the NARS/EIAR
- Some CGs less visible at national level; bits and pieces
- Inadequate alignment to NARS
- Lack of clarity in working modalities
- Lack of clear demarcation of activities
- Sometimes trivial programs to the country
- Inadequate synergy among the different CGs
- Inadequate focus on building the capacity of NARS
- At times drain the NARS/ manpower competition
- Recruiting independent staff for projects than making use of NARS

Challenges….

Related to financial allocation and handling

- Inadequate finance mobilization to NARS relative to CG allocations; high staff cost s/t up to 65 -70%
- Financial allocation transparency; handling and resource flow
- Unclear procedures and the budget details
- Budget / resources allocation on trivial activities/ items
- Sometimes too small grants
- overstrain on the facilities and physical resources of NARS not proportional to the resources allocated

A final remark

- ***Unarguably, the CGs have substantially contributed to Ethiopian Agriculture through helping to make improved agricultural technologies available***

- ***To the extent the country hosted a large number of CGs the impact needs to commensurate with***

- ***Therefore, EIAR/EARS look forward to an enhanced win-win, transparent, productive collaboration and a sustained partnership to creating impact to the livelihood of people in Ethiopia and beyond***

I thank you.