



Modern plant breeding for sustainable agriculture and the benefits of certified seed

Latvian Seed Growers Association - Seed Congress

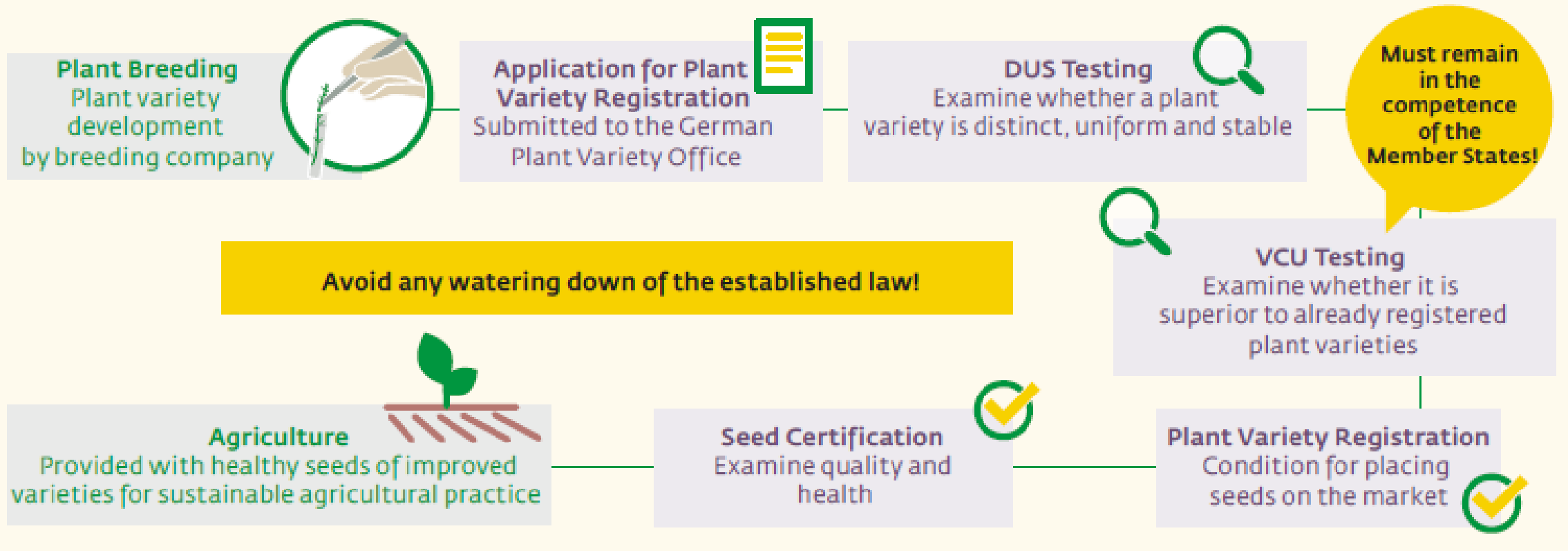
RIGA

24. February 2026

Dr. Laszlo Cselenyi

Plant Variety Registration and Certification

// Official plant variety examination and seed certification are the cornerstone for a sustainable agriculture



Agriculture at the Intersection of Environment and Society



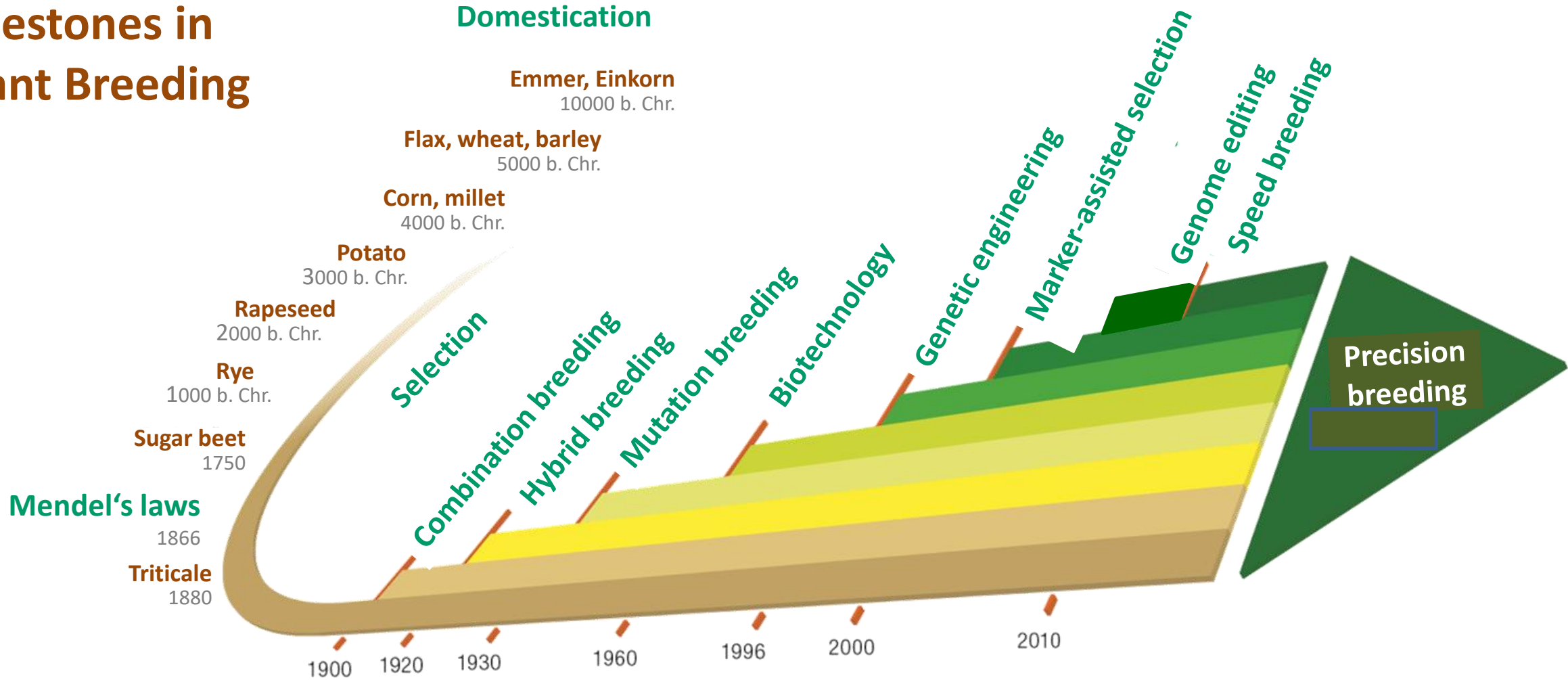
Challenges

- Impacts of climate change
- Decreasing availability of chemical agents for crop protection
- Reduction of fertilizer application rates
- Nature/water protection
- Expansion of organic farming

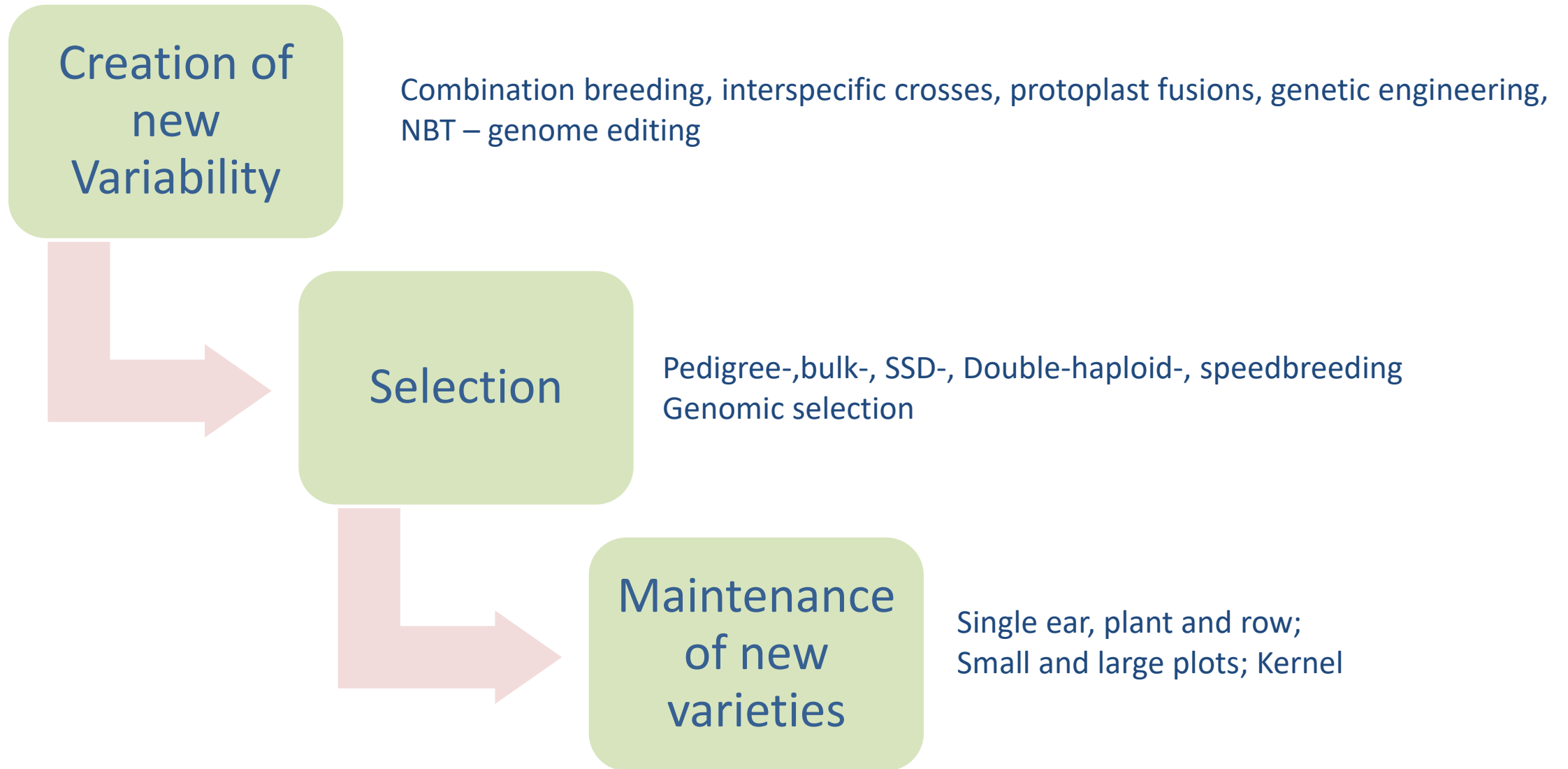
Breeding goals

- Improvement of disease resistance
- Increase in pest tolerance
- Strengthening of resistance to abiotic stress
- Increase in yield and stability
- Quality traits for processing industry/consumer

Milestones in Plant Breeding

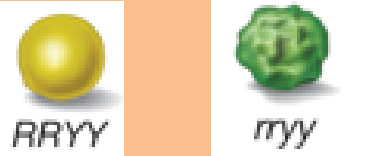


Variety development



Creating new variability – combination breeding before selection

That's what we have:



Breeding goal:
a round green pea

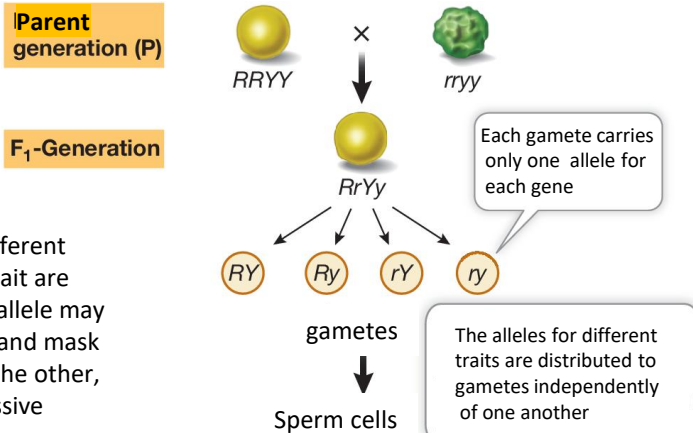


Mendel's Laws:

- Law of segregation
- Law of independent assortment
- Law of Dominance



pedigree breeding



When two different alleles for a trait are present, one allele may be dominant and mask the effect of the other, which is recessive

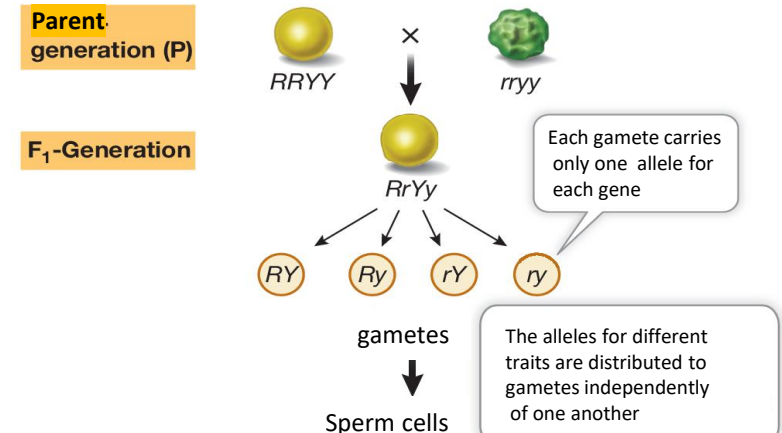
F₂-Generation

	RY	Ry	rY	ry
RY	$RRYY$	$RRYy$	$RrYY$	$RrYy$
Ry	$RRYy$	$RRyy$	$RrYy$	$Rryy$
rY	$RrYY$	$RrYy$	$rrYY$	$rrYy$
ry	$RrYy$	$Rryy$	$rrYy$	$rryy$

Egg cells

9:3:3:1 Segregation in F₂

Double-haploid-breeding



DH0-Generation

	RY	Ry	rY	ry
RY	$RRYY$	$RRyy$	$rrYY$	$rryy$
Ry	$RRYy$	$RRyy$	$rrYy$	$rryy$
rY	$RrYY$	$RrYy$	$rrYY$	$rrYy$
ry	$RrYy$	$RrYy$	$rrYy$	$rryy$

No Egg cells
No recombination!!!

1:1:1:1 Segregation in DH₁

DH-Technology

– the most innovative method in winter barley breeding

Less than 1 year from the cross to genetically-fixed Lines!



Durations of different breeding methods – the size of generations in the selection process

Year	<i>Pedigree</i>	Speed Breeding	DH	Number of varieties	Number of test locations
1	Cross	Cross, F1, F2	Cross, F1, DH-production	200	1
2	F1 selection	F3	DH0	40.000	1
3	F2 selection	F4	DH1	15.000	1
4	F3 selection	F5 test	DH2 test	300	8
5	F4 selection	F6 test	DH3 test	60	14
6	F5 test	F7 test	NL 1	8	14
7	F6 test	NL 1	NL 2	4	14
8	F7 test	NL 2	NL 3	2	24
9	NL 1	NL 3	Registration	1	100

Breeding objectives

Yield potential

yield (Plant Density; Number of Kernel/Ear; TGW)

Yield stability

Agronomic characteristics (Plant length; Heading date; ripeness; winter hardiness)

Adaptation to environmental stresses (Heat and drought tolerance)

Plant health (resistance to pests and diseases)

Straw stability (Lodging; brackling and necking)

reduction of dependency on chemicals through natural resilience

Yield quality

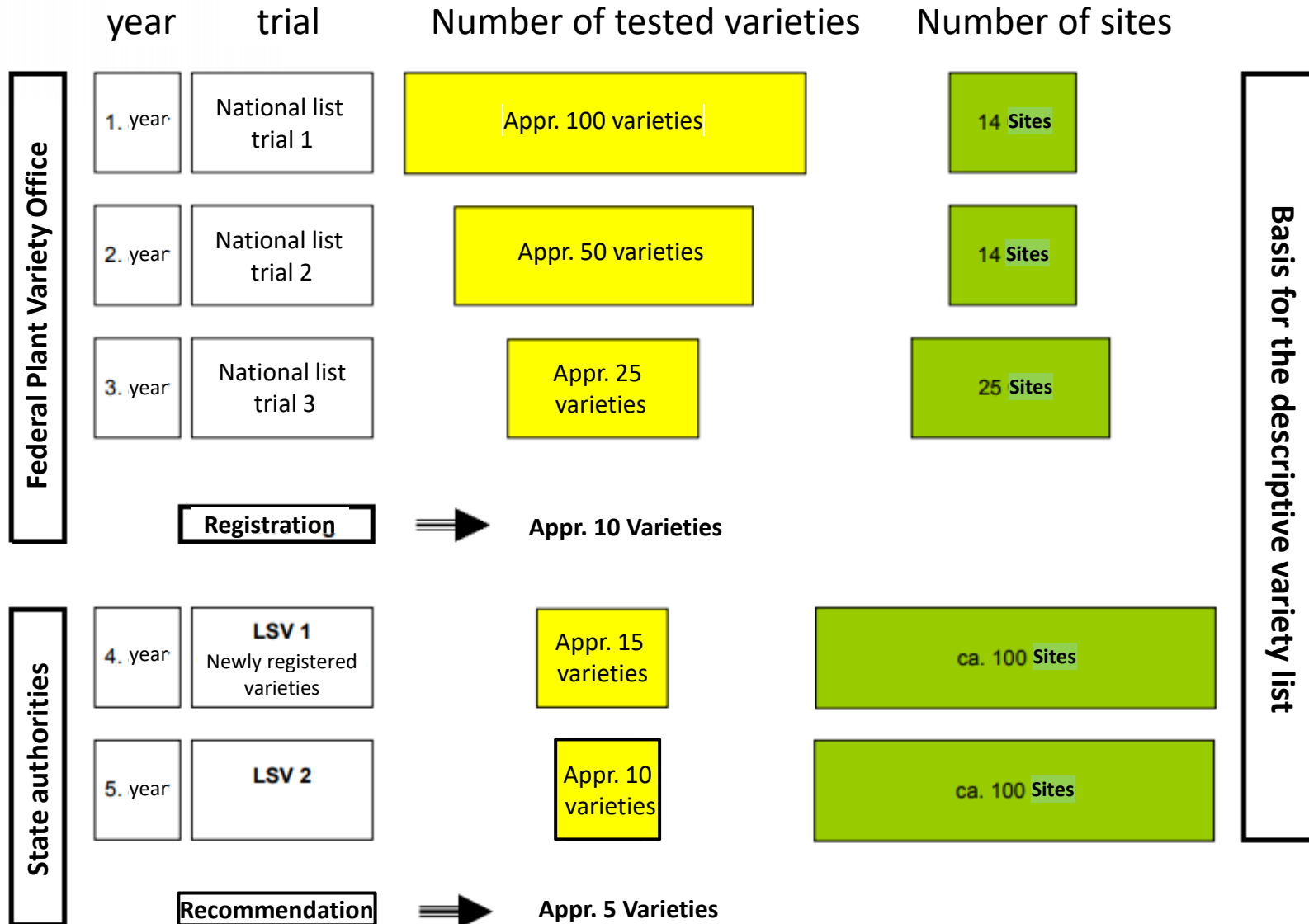
Grain quality (TGW; Specific weight; Protein content; falling number)

Malting quality (Malt extract; Friability; Viscosity; Protein solubility; Degree of final fermentation)

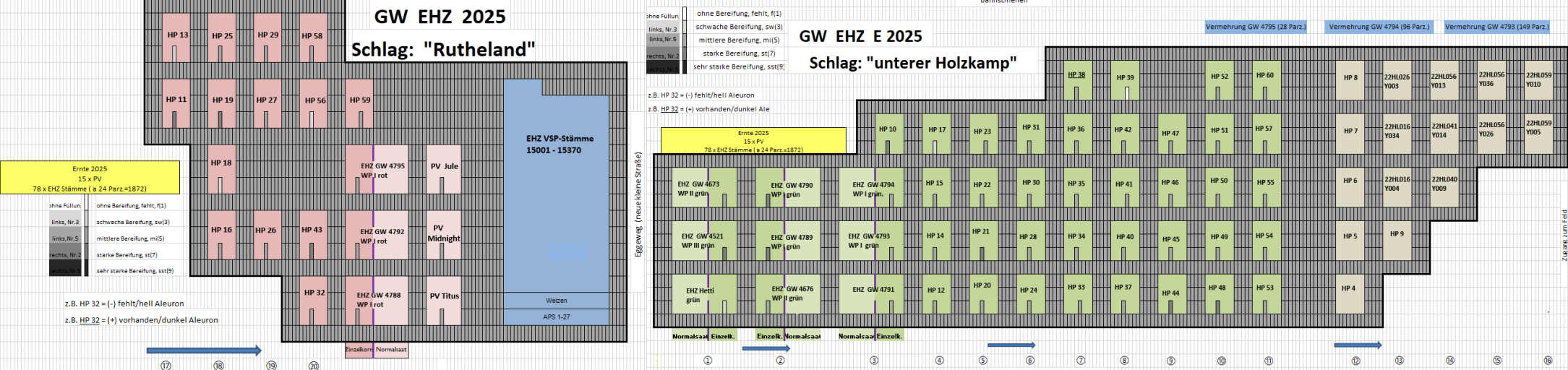
Baking quality (Protein; Falling Number stability; Sedimentation value; Water absorption; Flour extract; Loaf volume)



Official testing of cereals at Bundessortenamt – post registration trial system in Germany



Start of seed production (maintenance) five years before registration



Seed industry in Germany



Plant Variety Protection (PVP) owner
(Breeding and Sales Companies)



G1 Elite seed
Breeder

G2 Breeder's seed
Breeder

G3 Prebasic seed
Breeder

G4 Basic seed
Breeder or Producer

Seed producing companies



Seed producing sub-companies



Production Farms



Certified seed 1. Generation
producer company

Certified seed 2. Generation
producer company

Customer – growers/farmers



Our product: certified seed



- Price components of certified seed



1000 kg big bag: 800€*

Standard crop price

This part doesn't go to Breeders:
650€*

Packaging, transport, storage

Overheads

Seed treatment

Certification fee

Producer's fee, Profit margin

Royalties for breeding costs,
research and development

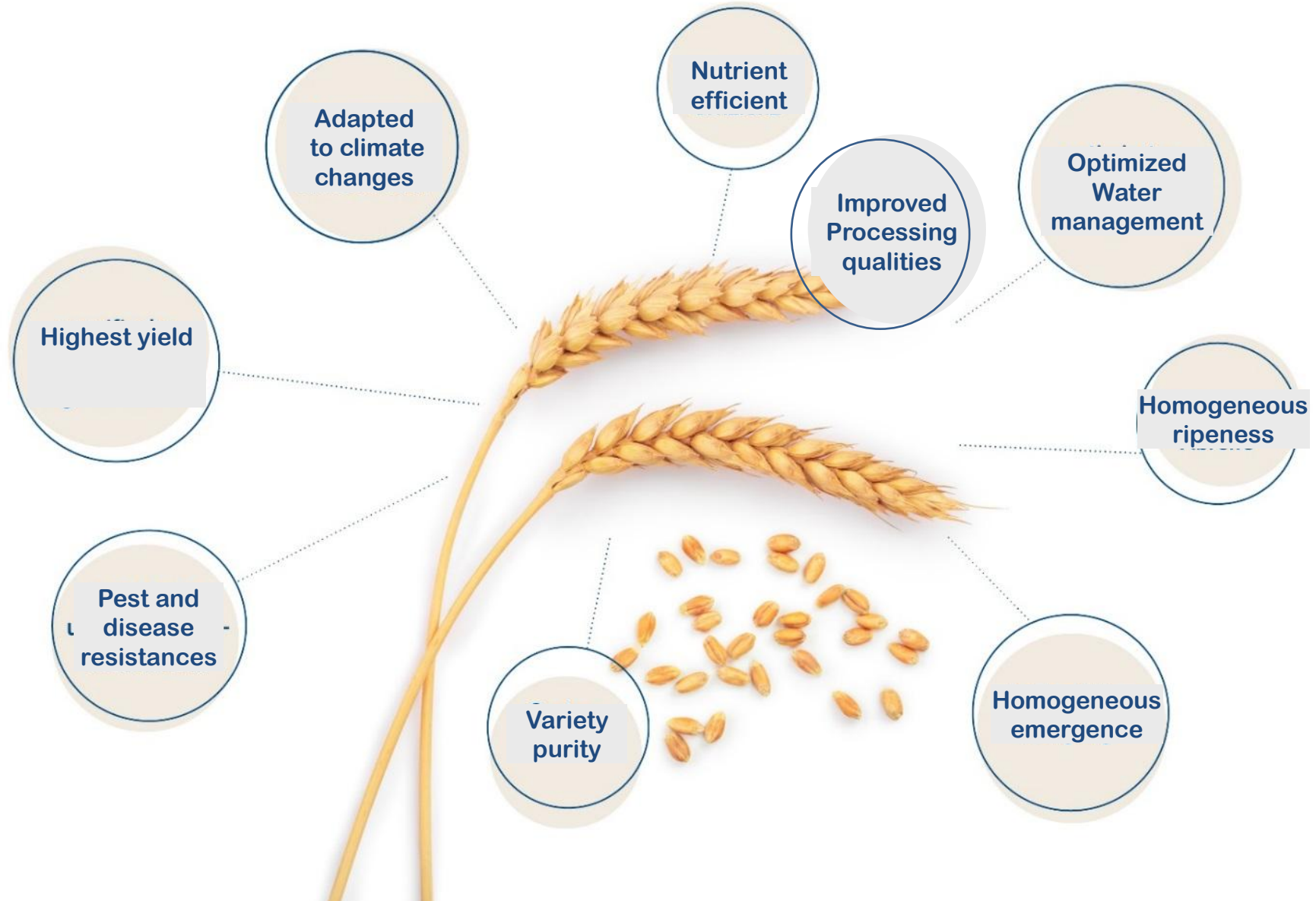
Royalty: 150€*

Financing the breeding through

The benefits of certified seed



The attributes of Certified Seed – enhanced traits



Seed exchange rate 2024/2025 (with seeding rate and certification)

Cereal crop	Growing area (ha) estimated Harvest 2025	Seed amount dt/ha 2024/25	Seed demand dt	Seed sales 2024/2025 dt*	Seed exchange rate 2024/25	FSS** in %
Winter wheat*	2.911.900	1,67	4.863.314	2.363.243	49 %	51
Winter barley	1.210.300	1,53	1.847.517	1.212.800	66 %	34
Rye W+S	540.800	0,68	367.445	366.379	100 %	0
Triticale W+S	288.000	1,59	458.616	355.899	78 %	22
Spring barley	314.200	1,75	549.379	349.275	64 %	36
Spring wheat	47.100	1,86	87.451	72.739	83 %	17
Oat W+S	187.100	1,45	270.547	162.771	60 %	40
Winter cereals total	4.951.000	1,52	7.536.892	4.298.321	57 %	43
Spring cereals total	548.400	1,65	907.376	584.785	64 %	36
Cereals total	5.499.400	1,54	8.444.268	4.883.106	58 %	42

* incl. Dinkel, Einkorn and Durum

** FSS = Farm Saved Seed

Conditions for Farm Saved Seed

The farmer may use farm saved seed without the consent of the PVP holder provided he

- pays **farm saved seed royalties until the 30th of June**
- and
- **responds to a declaration request.**

Exception: Smallholding farmers are exempted from farm saved seed royalties (but must declare such use)

Smallholding farmer → depending on region, on average: approx. 20 ha cultivation area or < 5 ha potato cultivation area

- Non-compliance with 1 condition → infringement upon PVP holder's rights!

The plant breeders commission STV with the enforcement of their legal claims:

- **Royalty department**
 - Through inspections of the breeders' contractual partners, the STV ensures that the royalty-fees from seed sales are fully returned to the breeders.
- **Farm saved seed department**
 - invoicing of FSS fees (for the account of the breeders)
 - Enforcement of other legal claims (damages, cease-and-desist declaration, accounting claims)

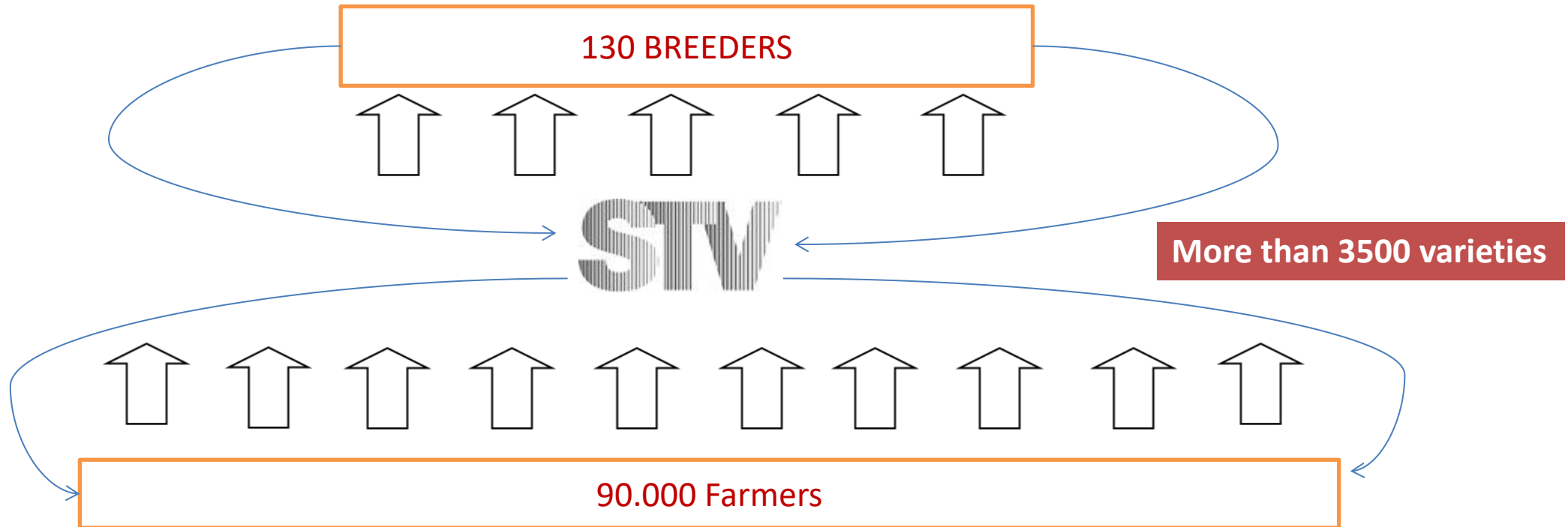
Farm Saved Seed Royalty Collection

The royalty collection process in detail:

- A form sheet is sent every Year **in April** to approx. 80,000 – 90,000 farmers on which they can declare their use of FSS.
- When STV has information indicating that the farmer has used FSS (a “clue”), this is pre-printed into this form.
- When presented with such a clue, the farmer is under an obligation to file a declaration (under § 10a German PVP Act and Art. 14 EU PVP Regulation).
- The royalties payable are calculated on the amounts declared and invoiced to the respective farmers.
- If a farmer does not comply with their obligations under the FSS legislation, they have to pay damages (the full licence fee, in repeated cases 4 times the full licence fee) and sign a cease & desist declaration
- In some cases, court proceedings are needed to enforce the plant breeders' rights.

Farm Saved Seed Royalty Collection

The way of the collected FSS royalties to the breeders



Advantages for the farmer

- The farmer receives one and only one request to file a FSS declaration and a single invoice
- farmers have only one single contact point for all dealings concerning farm saved seed royalties

RATGEBER

Informationen und Sortenliste der STV zur Nachbauerklärung
Herbst 2023/Frühjahr 2024



Saatgut-Treuhandverwaltungs GmbH (STV)
Kaufmannstr. 71-73 - 53115 Bonn
Service-Center: 0228 96943160
Telefax: 0228 96581-99
E-Mail: stv@stv-bonn.de

Fairness bringt Fortschritt.



Winterweizen

Sortenbezeichnung	Fruchtart-schlüssel	Zahlen-code	Sortenschutzinhaber / ausschließlicher Nutzungsberechtigter	Z-Lizenz-gebühr €/dt	Nachbau-gebühr €/dt	MwSt. %	Sortenschutz
Sheriff	WW	35652	InterSaatzucht GmbH	13,50	6,75	19	EU
Shrek	WW	44189	Hauptsaatn für die Rheinprovinz GmbH	16,00	8,00	19	EU
Skagen	WW	24041	W. von Borries-Eckendorf GmbH & Co. KG	7,00	3,50	19	EU
Solehio	WW	33318	KWS LOCHOW GmbH	15,25	7,63	19	EU
Spencer	WW	39368	KWS LOCHOW GmbH	12,35	6,18	19	EU
Sphere	WW	43173	KWS LOCHOW GmbH	13,25	6,63	19	EU
Spontan	WW	34151	Limagrain GmbH	12,50	6,25	19	EU
SU Aventinus	WW	40987	Strube Research GmbH & Co. KG	12,00	6,00	19	EU
SU Banatus	WW	42550	Strube Research GmbH & Co. KG	9,00	4,50	19	EU
SU Ecusson	WW	43276	Hauptsaatn für die Rheinprovinz GmbH	16,00	8,00	19	EU
SU Fiete	WW	43300	W. von Borries-Eckendorf GmbH & Co. KG	13,80	6,90	19	EU
SU Habanero	WW	40867	Nordsaat Saatzucht GmbH	12,70	6,35	19	EU
SU Jonte	WW	43319	W. von Borries-Eckendorf GmbH & Co. KG	14,30	7,15	19	EU
SU Mangold	WW	40971	Strube Research GmbH & Co. KG	13,80	6,90	19	EU
SU Selke	WW	39534	Nordsaat Saatzucht GmbH	11,50	5,75	19	EU
SU Tarroca	WW	43263	Hauptsaatn für die Rheinprovinz GmbH	14,50	7,25	19	EU
SU Willem	WW	44202	W. von Borries-Eckendorf GmbH & Co. KG	14,30	7,15	19	EU
SY Cellist	WW	42629	Syngenta Seeds GmbH	13,20	6,60	19	EU
SY Koniko	WW	41277	Syngenta Seeds GmbH	13,20	6,60	19	EU
SY Revolution	WW	44924	Syngenta Seeds GmbH	15,20	7,60	19	EU
SY Transition	WW	44936	Syngenta Seeds GmbH	14,00	7,00	19	EU
Talent	WW	37012	KWS LOCHOW GmbH	15,25	7,63	19	EU
Tarroca	WW	43263	Hauptsaatn für die Rheinprovinz GmbH	14,50	7,25	19	EU
Tekno	WW	37463	Hauptsaatn für die Rheinprovinz GmbH	12,50	6,25	19	EU
Tiberius	WW	39132	Saatbau Deutschland GmbH	13,10	6,55	19	EU
Tiger	WW	19615	PZO-Pflanzenzucht Oberlimpurg Stephanie Franck	8,50	4,25	19	EU
Tillsano	WW	44779	KWS LOCHOW GmbH	15,50	7,75	19	EU
Tobak	WW	30199	W. von Borries-Eckendorf GmbH & Co. KG	10,50	5,25	19	EU
Tobias	WW	33301	KWS LOCHOW GmbH	15,25	7,63	19	EU
Tommi	WW	20336	Nordsaat Saatzucht GmbH	7,00	3,50	19	EU
Tonnage	WW	38050	Saatbau Deutschland GmbH	13,00	6,50	19	EU
Toras	WW	21665	Syngenta Seeds GmbH	11,00	5,50	19	EU



Thank you!

Paldies!

