



Crossing Wheat

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Wheat breeder must?

Good observer,

Medium Intelligent (s)

Patience

Hard worker

Lucky.

Breeding aims

Stable (good performance in different years and climate conditions)

- ✓ Resistance to cold, drought, heat, disease and pests,
- ✓ High yield,
- ✓ improved material suitable for industry and consumer.





Yellow
rust



Source Of Variation

- Wild relative ?
- Local populations or local varieties ?
- Lines ?
- Varieties from inside and outside of country?

Crossing

- Crossing Block (Parents for crossing)
 - ✓ Yield data
 - ✓ Disease data
 - ✓ Quality data
 - ✓ Morphological traits.

Data record on Crossing block

- Entry number 20
- Cross Csm/ Grk 79 (Bayraktar)
- Pedigree YA 19484-0A-0A-2A-0A
- Origin 1991 ÖVD 125(OREGON/TUR)
- Yellow rust Leaf rust 30ms mr
- Stem rust 0 doğ
- Tilletia 0 doğ

Data record on Crossing block

- Growing type. 2 (1-5) (1-10)1 winter/spring
- Plant height 80, 83, 91, 78,65
- Spike growing date 18/5, 17/5 ,24/5
- Awn +
- Colour of spike W-R Colour of grain W-R
- Protein 12.8 11.9 13.1 Sds.27, 25,30
- 1000 kernel weight 34, 32, 28,
- Hectolitre weight 75,73,72

- Breeder must know genetics and heredity of important traits .

How can we select parents?

- ✓ High yield
- ✓ Adaptation
- ✓ Resistance to disease
- ✓ Heredity potential of good quality to pass sibs.



Crossing Types

- Simple cross $A \times B$
- Reciprocal cross $A \times B$ ve $B \times A$
- Three way, Triple cross $A \times B$ $F_1 \times C$
- Back cross $A \times B$ $F_1 \times A$ veya $F_1 \times B$
- Doblecross $A \times B$ $C \times D$
- $F_1 \times F_1$

Crossing Strategy

- ✓ More crosses and less spike from each combination ?
- ✓ Less cross more spike?



Parent selection



Parental selection is the most important part of success. Correct parents will conduct the breeder to successful varieties.

Disease, Quality, Yield , Earliness, Tolerance to stress: Heritability of those characters must be known.

**LOCAL x INTRODUCTION
(LOCAL x INTRODUCTION) x LOCAL**

Degree of earliness ?

Degree of cold tolerance?

Degree of drought tolerance ?

Which disease and degree of tolerance?

Which insect damage ?

Sensitivity to daylight duration time?

Use of material(French bread, thin bread, pasta, bulgur pasta)

Crossing Wheat

A photograph of a wheat field with several people examining the plants. The text "Crossing Wheat" is overlaid in the center, and the date "01/01/2004" is in the bottom right corner. The scene shows a dirt path winding through rows of green wheat plants. In the foreground, a man in a light blue vest and a red and white striped shirt is kneeling and examining a plant. To his right, another man in a brown vest is also kneeling and looking at a plant. Further down the path, two more people are visible, one in a blue shirt and another in a pink shirt, both engaged in similar activities. The background is filled with lush green trees under a bright sky.

01/01/2004















CROSSING TECHNIQUE





CROSSING INCOMPATIBILITY



Data on crossing bag

Emasculation date

Name of person

**Mother parent name and number/
Father parent name and number.**

Now you made variation for
breeding.

?

SELECTION

Evolution/Natural Selection



Plant breeding

Selection of “good” plants

“Within heterogeneous material select suitable plants”

WHICH SELECTION METHODS

- ✓ MASS SELECTION ?
- ✓ TANDEM SELECTION?
- ✓ BULK SELECTION ?

- ✓ WHICH.....

Modified Bulk Methodology

AXB (Cross)

F1

F2 Bulk

F3 Bulk Modification (Selection disease(YELLOW RUST)
Stresses (DROUGHT COLD MICRO QUALITY)

F4 Bulk

F5 Bulk

F6 Spike selection

PYT Bulk(Selection Yellow rust stem rust , cold ,Drought
Quality Yield)

First Year YT Diseases micro quality yield

Second Year YT Diseases macro quality Yield,

Regional YT Diseases Stresses macro quality and yield .

Candidate for registration

Data

- Tosunbey; EÇVD-12/KRÇ-66//CROW 'S'
- YA20688-0A-0A-0A-0A-9A-0A
Eser; AGR/NAC//LIRA
YA21269-0A-0A-0A-4A-12A-0A
- Kızıltan-91 ÜVY 162/61-130//BYE*2/TE
YA03912 0A-17A-1A-3A-0A

Data

Crossing block data YA 20688-0A-0A-0A-9A-0A

Code of institution . TOR00001

Seg. Material data

PYT ,YT data

Disease, pest , Quality data.

Registration ,

Plant breeding right data ,

Pre basic and basic seed production data

CONGRATATIONS !!

Now you have a variety
What can you do

?

Why Variety lost purity?

- Spontaneous mutations

Self pollinated crops % 0.5-1 out-crossing

- Mechanical mixtures

→ Combiner

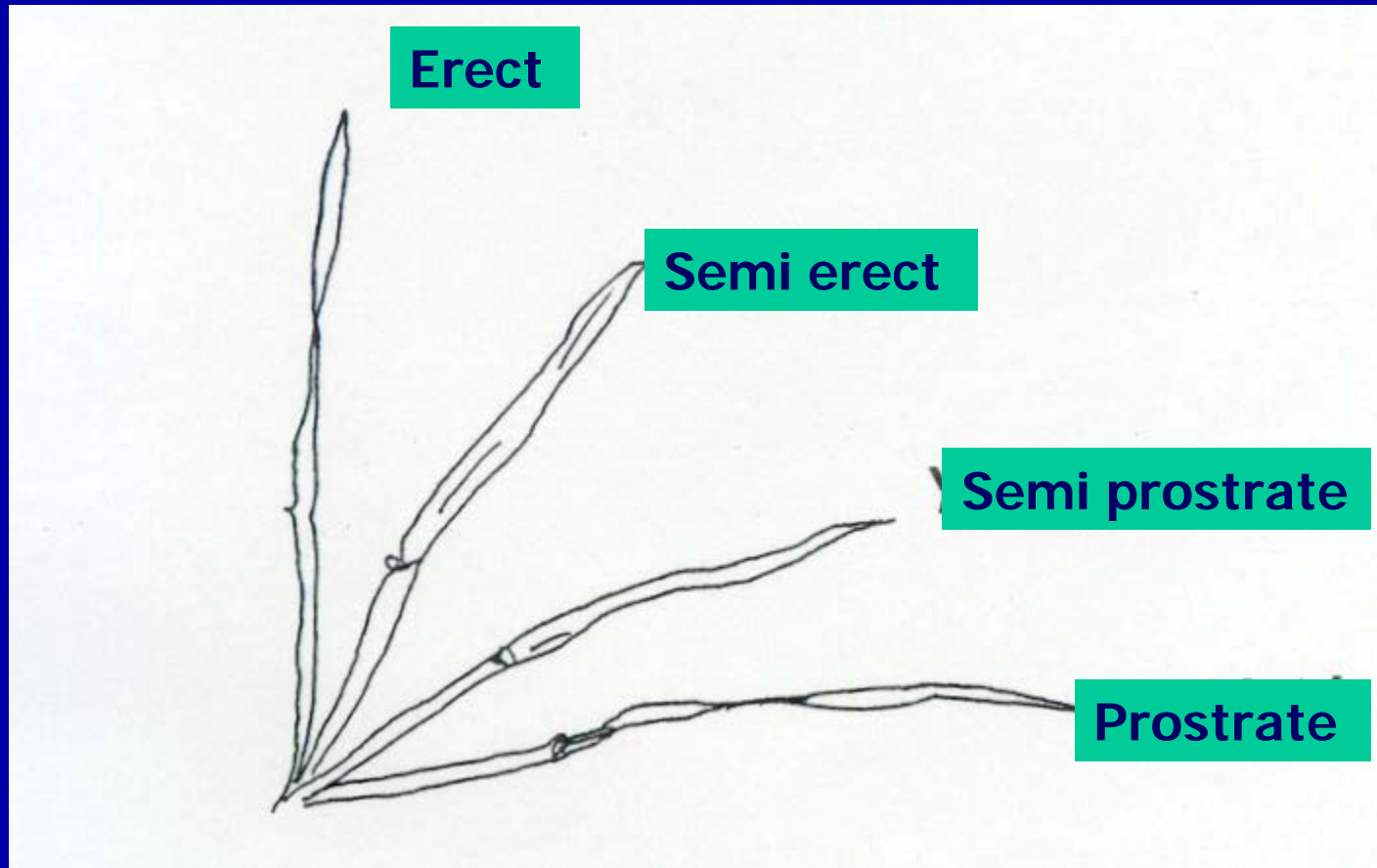
→ carrier

→ harvest machine

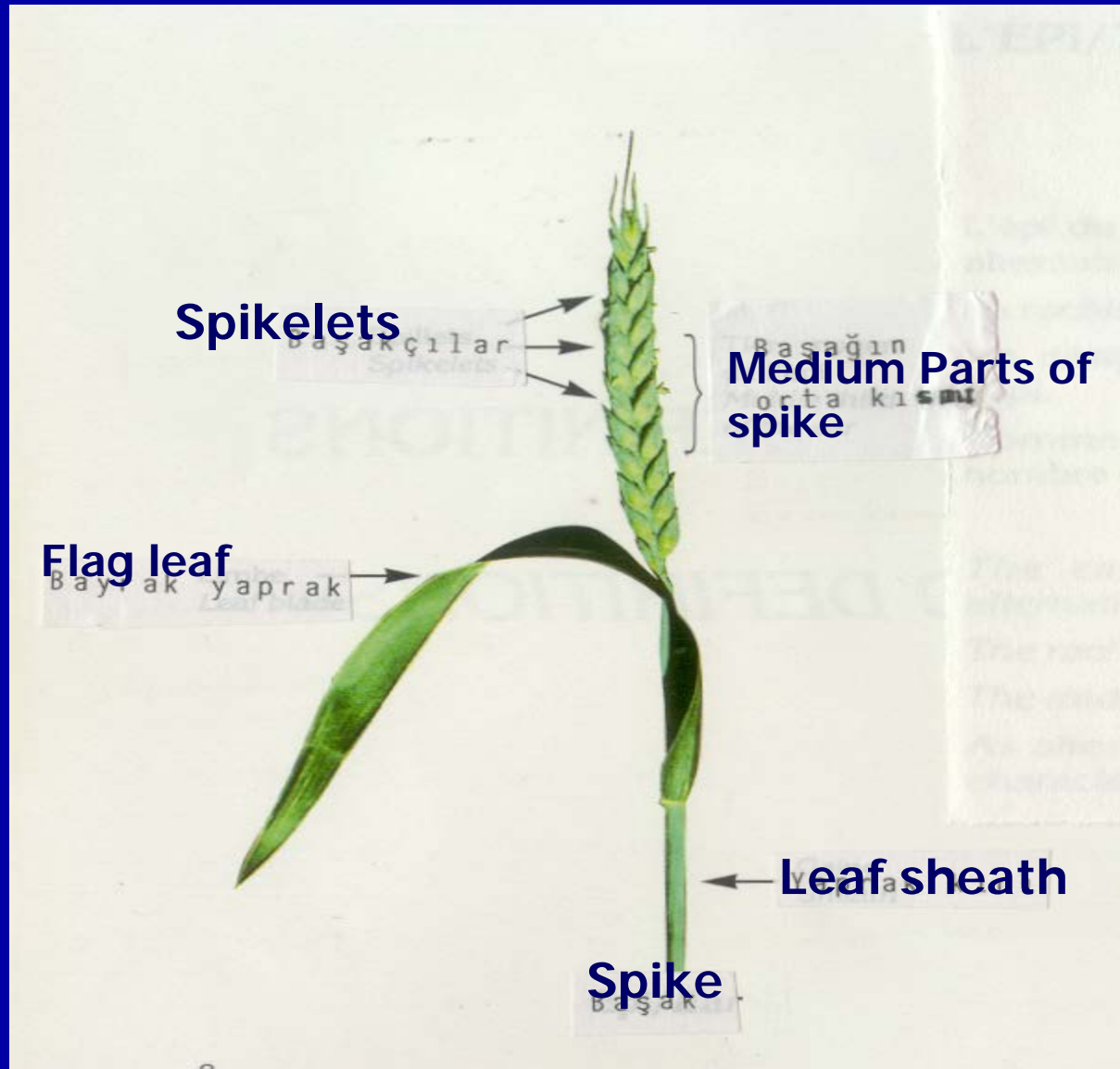
→ storage

How to detect mixtures in your variety?

Plant growth habit



Spike



Spikelet

Anther glume



Interior glume

Glumes and lemma

Shoulder beak

Geniş kanat-Glume



Dar kanat

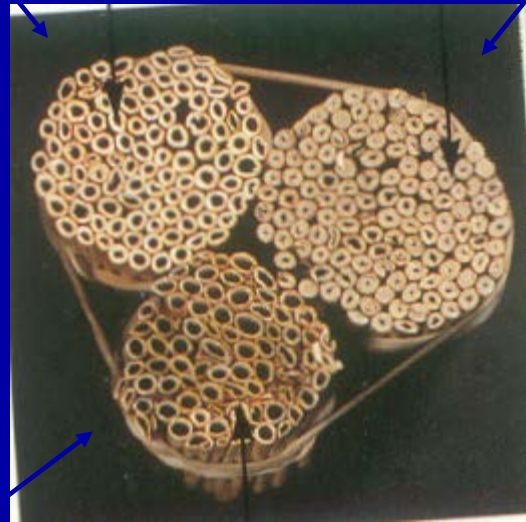


Lemma

Stem thickness

Medium

Thick



Thin

Length of Awns



Very short

Short

Medium

Long

Color of Spike

Brown



White

Glauousness of spike



Absent or very weak Strong

Weak, medium, strong

Density of Spike



Very lax

Medium

Dense

Lax

very dense

Shape of spike

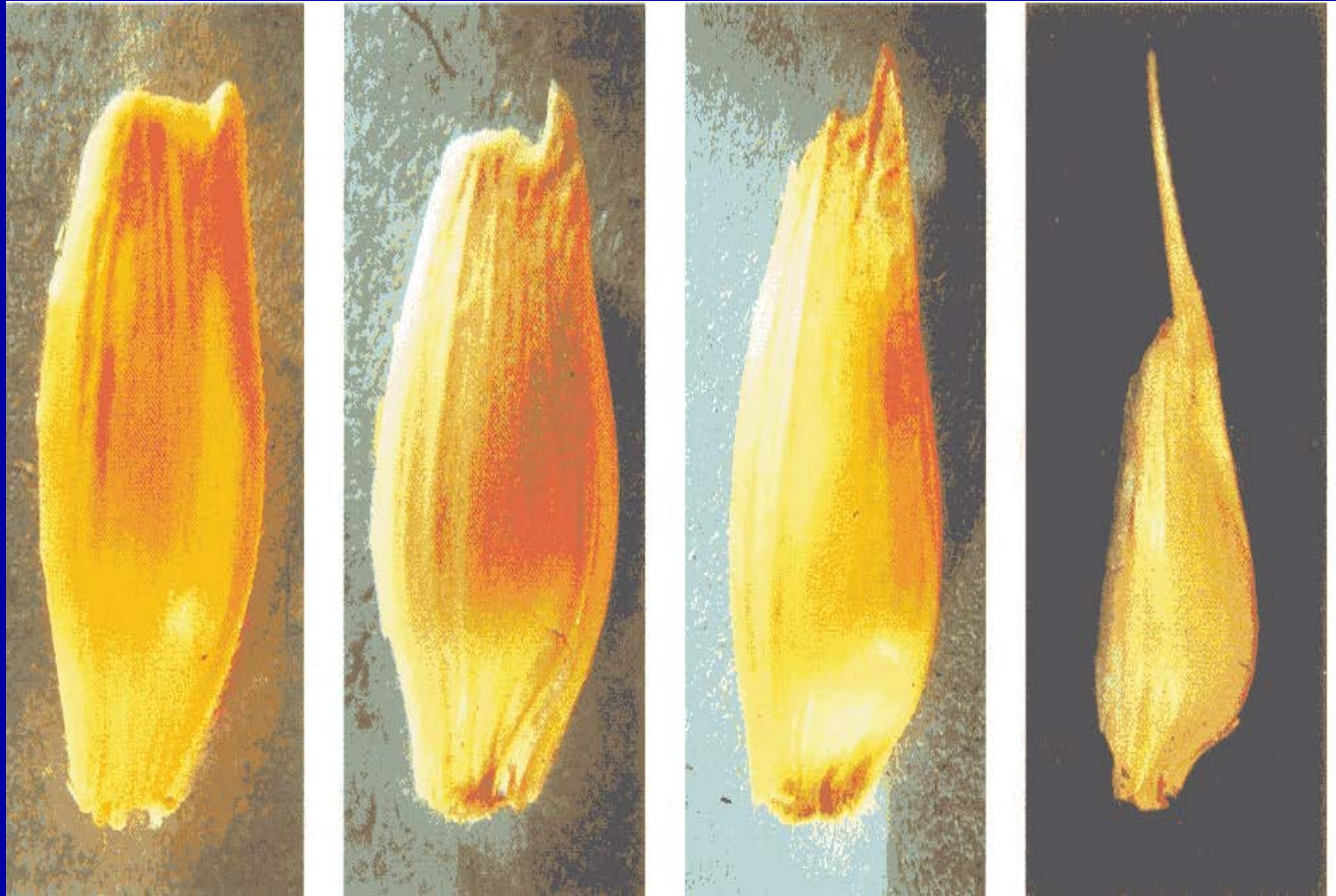


Tapering

Parallel

Spindle or Fusiform

Long Awn of (BEAK) Lowest Palea,



short

Medium

Long

Very long

The hair type of rachilla axle



Not or wery few



Strong

Color of Grain



White



Red



28 7 2003



