

# RECIPROCAL EFFECT OF PARENTAL LINES ON CORN HYBRID SEEDS PERFORMANCE

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## INTRODUCTION

In the corn crop (*Zea mays* L.), obtaining high quality seeds is closely related to heterosis and the use of compatible parental lines contributes to the increase of this phenomenon. In this regard, it must be considered the reciprocal effect of parental lines used in a cross, since certain characteristics are controlled by cytoplasmic genes and is inherited from the maternal lineage.

## OBJECTIVE

This research aimed to study the reciprocal effect of parental lines on the physiological potential of corn hybrid seeds.

## MATERIAL E MÉTODOS

Twelve corn hybrid seeds (HS 12, HS 13, HS 14, HS 21, HS 23, HS 24, HS 31, HS 32, HS 41, HS 42, HS 51, HS 52) were initially evaluated and after three months by:

**Seed Water Content (SWC):** 2×25 seeds, oven method 105 ± 3 °C for 24 h;

**Germination (GE):** 4×50 seeds, in rolls of germination paper, kept in a germination chamber at 25 °C; seedling evaluations at 4 and 7 days;

**Vigor - First Count of Germination (FC):** conducted with germination test, seedling evaluation at 4 days

**Cold test (CT):** 4×50 seeds, in rolls of germination paper with soil, kept in a cold room chamber at 10 °C for 7 days; 25 °C for 4 days;

**Vigor - Accelerated aging (AA):** 250 seeds, 45 °C / 72 h;

**Vigor - Electrical Conductivity (EC):** 4×50 seeds, 75 mL, 25 °C / 24 h;

**Seedling emergence in the field (SE):** 4×50 seeds, distributed in 2.5 m rows and 0.05 m spacing between row. Seedling emergence evaluation at 21 days;

**Statistical Procedures:** completely randomised design, Tukey test (5%).

## RESULTS

**Table 1.** Physiological potential of 12 corn hybrid seed lots: seed water content before (SWC) and after accelerated aging (SWCa), germination (GE), first count of germination (FC), cold test (CT), accelerated aging (AA), seedling emergence in the field (SE) and electrical conductivity (EC) tests.

Lots	SWC	SWCa	GE	FC	CT	AA	SE	EC
HS 13	7.7	21.9	99 a	73 c	99 a	78 c	94 b	19.2 d
HS 14	7.5	22.5	98 a	88 a	96 a	88 b	96 a	18.0 d
HS 15	7.7	21.4	98 a	79 b	92 b	70 d	96 a	19.0 d
HS 23	8.5	20.7	100 a	96 a	100 a	96 a	98 a	10.7 b
HS 24	8.8	23.1	100 a	84 b	100 a	98 a	100 a	11.5 b
HS 25	8.5	20.1	98 a	81 b	100 a	100 a	97 a	10.5 b
HS 31	8.2	19.4	98 a	93 a	100 a	95 a	98 a	16.8 c
HS 32	8.2	21.7	99 a	99 a	98 a	93 b	96 a	16.0 c
HS 41	8.5	18.3	100 a	92 a	100 a	98 a	98 a	7.4 a
HS 42	8.1	20.1	100 a	76 c	99 a	98 a	100 a	8.1 a
HS 51	7.3	21.5	100 a	90 a	99 a	90 b	98 a	16.9 c
HS 52	8.1	20.4	94 b	46 d	94 b	96 a	92 b	16.5 c
CV (%)	-	-	2.4	6.5	1.8	4.2	2.5	7.4

Means followed by the same letter in the column do not differ significantly at 5% level of probability according to Tukey test. CV (%) = Coefficient of Variation.

**Table 2.** Seed water content before (SWC) and after accelerated aging (SWCa), germination (GE), first count of germination (FC), cold test (CT), accelerated aging (AA), seedling emergence in the field (SE) and electrical conductivity (EC) tests of 12 corn hybrid seed lots after three months of storage.

Lots	SWC	SWCa	GE	FC	CT	AA	SE	EC
HS 13	9.1	21.7	96 b	90 b	94 b	44 d	84 b	22.3 f
HS 14	9.7	21.9	97 b	94 b	96 a	61 c	85 b	19.4 e
HS 15	11.0	21.9	96 b	92 b	90 c	29 e	88 a	21.1 f
HS 23	10.8	20.5	99 a	98 a	100 a	96 a	94 a	11.4 b
HS 24	9.8	12.3	100 a	98 a	100 a	98 a	80 b	12.3 c
HS 25	10.5	18.6	100 a	96 a	100 a	96 a	90 a	10.8 b
HS 31	10.0	18.0	98 a	96 a	98 a	80 b	91 a	16.4 d
HS 32	9.8	21.7	98 a	97 a	98 a	95 a	96 a	19.4 e
HS 41	11.1	21.4	100 a	98 a	98 a	96 a	78 b	8.8 a
HS 42	11.0	20.7	99 a	98 a	100 a	98 a	82 b	8.6 a
HS 51	10.8	22.1	98 a	97 a	96 a	71 b	92 a	19.6 e
HS 52	9.7	21.9	94 b	79 c	98 a	91 a	84 b	18.7 e
CV (%)	-	-	2.7	3.5	2.2	9.4	8.7	5.3

Means followed by the same letter in the column do not differ significantly at 5% level of probability according to Tukey test. CV (%) = Coefficient of Variation.

## CONCLUSIONS

The L1 lineage should be used as male parent, so that does not incur in a reduction of seed vigor of the crosses that use this lineage.

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