

Kombinationseignung

Bsp. Backvolumen - Qualitätsweizen

Sorte	Kreuzung	Backvolumen (ml)
Amadeus	Pokal / Kavkaz	613,47
Exquisit	Pokal / Agron	629,95
Leopold	Pokal / Karat	591,47
Capo	Martin / Pokal	590,19

⇒ Agron zeigt beste Kombinationseignung für das Merkmal Backvolumen

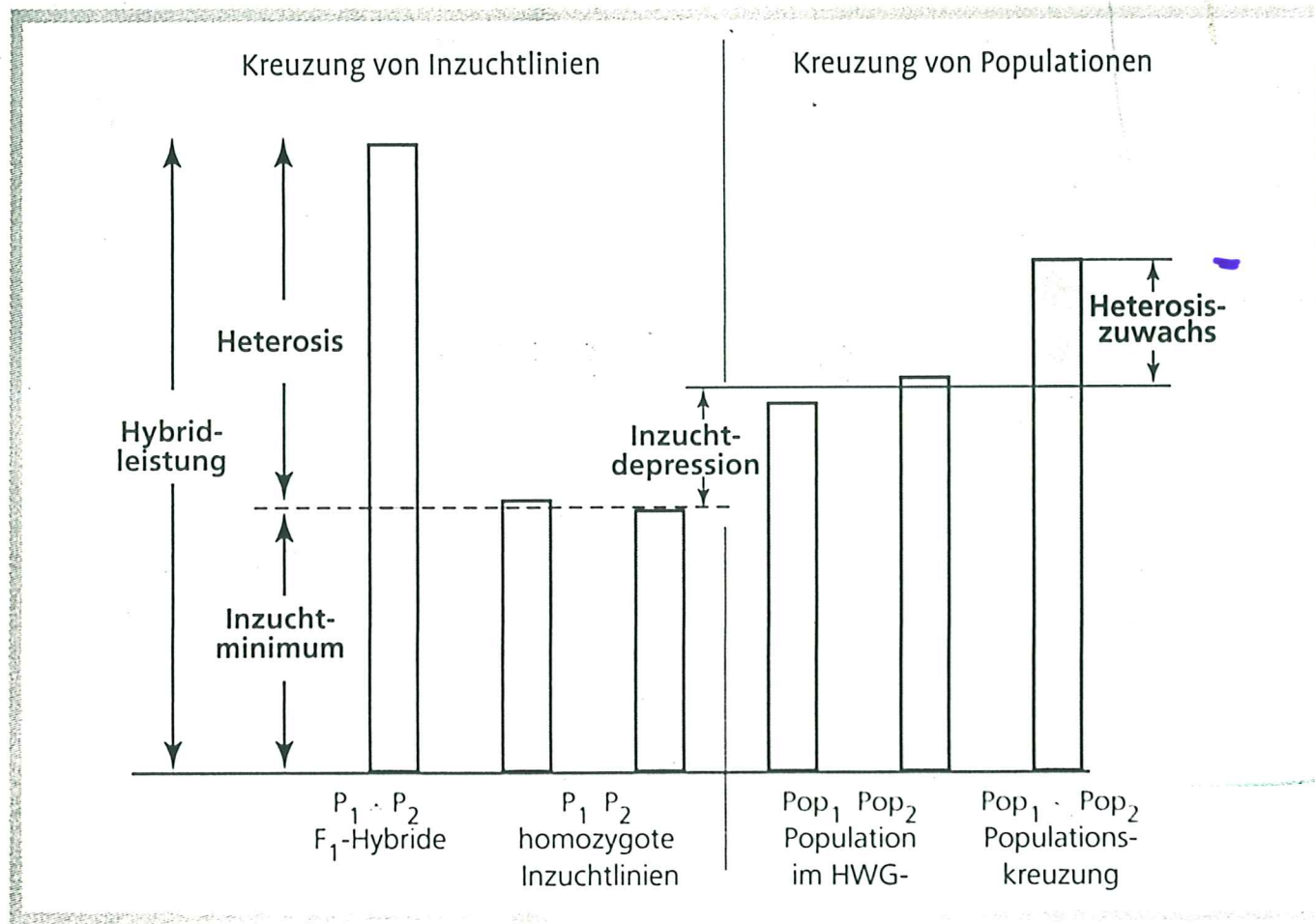


Abb. III-8
Zusammenhang zwischen Hybridleistung, Heterosis und Heterosiszuwachs.

HETEROBELTIOSIS

4. Beispiele

4.1. Diallel; Methode 4

	A	B	C	D	Σ_{Linie}	GCA_{Linie}	$GCA_{\text{corrLinie}}$
A	-	6,7125	6,39	5,47	18,5725	(0,126)	0,1894
(SCA)		(0,097)	(0,147)	(-0,118)			
SCA_{corr}		-0,178	0,058	0,12			
B		-	6,9	5,855	19,4675	(0,425)	0,6369
(SCA)			(0,359)	(-0,031)			
SCA_{corr}			0,12	0,058			
C			-	5,06	18,35	(0,052)	0,0781
(SCA)				(-0,454)			
SCA_{corr}				-0,178			
D				-	16,385	(-0,603)	-0,9044
Σ					72,775	0	0

$$\sum x_{ij} = (6,71 + 6,39 + 5,47 + 6,9 + 5,86 + 5,06) = 36,3875$$

$$\bar{x}_{..} = 6,0646$$

$$GCA_A = \frac{\sum A}{(n-1)} - \bar{x}_{..} = \frac{18,5725}{4-1} - 6,0646 = 0,126$$

$$SCA_{AB} = x_{ab} - \bar{x}_{..} - GCA_A - GCA_B = 6,7125 - 6,0646 - 0,126 - 0,425 = 0,097$$

$$\text{Korrekturfaktor: } \frac{(n-1)}{(n-2)}$$

$$GCA_{\text{corrA}} = GCA_A \times \frac{(n-1)}{(n-2)} = 0,126 \times \frac{(4-1)}{(4-2)} = 0,1894$$

$$SCA_{\text{corrAB}} = x_{ab} - \bar{x}_{..} - GCA_{\text{corrA}} - GCA_{\text{corrB}} = 6,7125 - 6,0646 - 0,1894 - 0,6369 = -0,178$$

4.2. 'Factorial'

	A	B	C	D	E	Σ_{Linie}	GCA_{Linie}
P	10,1	19,7	20,5	10,7	10,7	71,7	0,15
SCA	-0,88	2,25	1,22	-1,48	-1,11		
Q	14,1	18,4	22,5	15,1	12,9	83,0	2,41
SCA	0,86	-1,31	0,96	0,66	-1,17		
R	8,3	13,8	14,4	10,3	11,4	58,2	-2,55
SCA	0,02	-0,95	-2,18	0,82	2,29		
Σ_{Linie}	32,5	51,9	57,4	36,1	35,0	212,9	
GCA_{Linie}	-3,36	3,11	4,94	-2,16	-2,53		

$$\bar{x} = 14,1933$$

$$SCA_{AP} = x_{ap} - \bar{x} - GCA_A - GCA_P = 10,1 - 14,1933 - 0,15 + 3,36$$

4.3. Topcross

Kornertrag von Mais in kg/Parzelle

I-Linie	Eigenleistung	Topcrossleistung	GCA	Δ Topcross- - Eigenleistung	Heterosis*
IL 1	15	24	4,8	9	60,0
IL 2	14	16	-3,2	2	14,3
IL 3	13	18	-1,2	5	38,5
IL 4	18	21	1,8	3	16,7
IL 5	16	17	-2,2	1	6,3
Tester	12				
\bar{x}		19,2	0,0		

* in % des besseren Elters

5. Anhang: Diallel analysis D1 (Vers. 2.0)

D I A L L E L A N A L Y S I S D1 (Version 2.0)
 Ref.: GRIFFING B, 1956: Aust. J. Biol. Sci. 9: 463-493.

TRAIT : yield, maize
 M E T H O D : 4
 No. of PARENTS : 4
 ERROR - D.F. : 15
 ERROR - M.S. : 0.82

Genotype mean values from the randomized block design

1 / 2 = 6.7125 1 / 3 = 6.39 1 / 4 = 5.47
 2 / 3 = 6.9 2 / 4 = 5.855 3 / 4 = 5.06

A n a l y s i s o f V a r i a n c e, Model I, Method 4

Source	DF	SS	MS	F-Ratios
G C A	3	2.531	0.844	1.02
S C A	2	0.099	0.050	0.06
Error	15	12.347	0.823	

G C A / S C A - R a t i o = 16.997

T o t a l m e a n v a l u e = 6.065

G C A - E f f e c t s (General combining ability)

GCA (1) = 0.19
 GCA (2) = 0.64
 GCA (3) = 0.08
 GCA (4) = -0.90

S C A - E f f e c t s (Specific combining ability)

1 / 2 = -0.18 1 / 3 = 0.06 1 / 4 = 0.12
 2 / 3 = 0.12 2 / 4 = 0.06 3 / 4 = -0.18

D I A L L E L A N A L Y S I S D1 (Version 2.0)
 Ref.: GRIFFING B, 1956: Aust. J. Biol. Sci. 9: 463-493.

TRAIT : yield, durum
 METHOD : 1
 No. of PARENTS : 5
 ERROR - D.F. : 48
 ERROR - M.S. : 6.26

Genotype mean values from the randomized block design

1 / 1 = 35.8	1 / 2 = 35.1	1 / 3 = 43.2	1 / 4 = 35.9	1 / 5 = 36
2 / 1 = 37.5	2 / 2 = 39.2	2 / 3 = 43.1	2 / 4 = 38.8	2 / 5 = 39.8
3 / 1 = 42.2	3 / 2 = 41.2	3 / 3 = 42.8	3 / 4 = 37.7	3 / 5 = 46.2
4 / 1 = 37.3	4 / 2 = 39.5	4 / 3 = 37.6	4 / 4 = 34.8	4 / 5 = 39.9
5 / 1 = 39.2	5 / 2 = 40.3	5 / 3 = 45.4	5 / 4 = 39	5 / 5 = 43.1

A n a l y s i s o f V a r i a n c e, Model I, Method 1

Source	DF	SS	MS	F-Ratios
G C A	4	170.000	42.500	6.79
S C A	10	55.461	5.546	0.89
Reciprocal	10	12.385	1.239	0.20
Error	48	300.480	6.260	

G C A / S C A - R a t i o = 7.663
 T o t a l m e a n v a l u e = 39.624

G C A - E f f e c t s (General combining ability)

GCA (1) = -1.82
 GCA (2) = -0.25
 GCA (3) = 2.60
 GCA (4) = -2.09
 GCA (5) = 1.58

S C A - E f f e c t s (Specific combining ability)

1 / 2 = -1.25	1 / 3 = 2.30	1 / 4 = 0.89	1 / 5 = -1.78
2 / 1 = -1.25	2 / 3 = 0.18	2 / 4 = 1.87	2 / 5 = -0.90
3 / 1 = 2.30	3 / 2 = 0.18	3 / 4 = -2.48	3 / 5 = 2.00
4 / 1 = 0.89	4 / 2 = 1.87	4 / 3 = -2.48	4 / 5 = 0.34
5 / 1 = -1.78	5 / 2 = -0.90	5 / 3 = 2.00	5 / 4 = 0.34

R e c i p r o c a l E f f e c t s

1 / 2 = -1.20	1 / 3 = 0.50	1 / 4 = -0.70	1 / 5 = -1.60
	2 / 3 = 0.95	2 / 4 = -0.35	2 / 5 = -0.25
		3 / 4 = 0.05	3 / 5 = 0.40
			4 / 5 = 0.45

H e t e r o s i s (% based A: on better parent, B: on parent mean)

combination	A	B	combination	A	B
1 / 1	0.0	0.0	4 / 1	4.2	5.7
1 / 2	-10.5	-6.4	4 / 2	0.8	6.8
1 / 3	0.9	9.9	4 / 3	-12.1	-3.1
1 / 4	0.3	1.7	4 / 4	0.0	0.0
1 / 5	-16.5	-8.7	4 / 5	-7.4	2.4
2 / 1	-4.3	0.0	5 / 1	-9.0	-0.6
2 / 2	0.0	0.0	5 / 2	-6.5	-2.1
2 / 3	0.7	5.1	5 / 3	5.3	5.7
2 / 4	-1.0	4.9	5 / 4	-9.5	0.1
2 / 5	-7.7	-3.3	5 / 5	0.0	0.0
3 / 1	-1.4	7.4			
3 / 2	-3.7	0.5			
3 / 3	0.0	0.0			
3 / 4	-11.9	-2.8			
3 / 5	7.2	7.6			