



Seventh framework programme  
Food, Agriculture and Fisheries, and Biotechnology

Specific International Co-operation Actions  
Small or medium scale focused research project



# Sweet Sorghum an alternative energy Crop



**SWEETFUEL / Grant Agreement n° 227422**

## **Deliverable 1.4:**

*Several tens elite B and R-accessions  
with high WUE*

Composition of the consortium

**CIRAD**  
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## Maintainer Pool Development (B-Lines)

Inside the maintainer pool development 101 B-lines were evaluated concerning their cold temperature adaptation in Germany (ZM12-BL-F5-EU) and in France (ZU12-CMS-F5-EU). At the same time the complete material was planted in the summer nursery in Italy to evaluate the water use efficiency (WUE) and also to start directly the introgression into cms-plasma (A-Line development/ZM12-CMS-F5-EU).

For the selection environment in Italy different females could be selected, because of the limited amount of water and also we need here later material for the hybrid development compared to Germany. The field for selection was only one time irrigated during the vegetation period to have a good idea of the WUE of the different lines. Best selected material in Italy is shown in Table 1.

**Table 1: Best performing maintainer lines in comparison to the check rows (Check 1-10) in Italy**

ID	PROG	IDT	INB_CODE	GENOTYPE	DER	F_M	PLASMA	GENER	EV Italy 29_06	GIMP
1	F5-EU	ZM9-78291	Check 1	1Z1602A1			A1	S10	4	2,5
2	F5-EU	ZM0-30067	Check 2	1Z1064A1			A1	S10	3	2
3	F5-EU	ZM0-30077	Check 3	B			A1	F1	4	1
4	F5-EU	8N-8053	Check 4	341			A1	S10	4	2,5
5	F5-EU	8N-8070	Check 5	339			A1	S10	3	4
6	F5-EU	Z2Y-5504	Check 6	BC211312			A1	S10	2,5	2
7	F5-EU	Z2Y-5502	Check 7	1Z2245A1			A1	S10	2	1,5
8	F5-EU	Z9N-9545	Check 8	352			A1	S10	2,5	2
9	F5-EU	Z2N-7020	Check 9	62			A1	S10	4	1
10	F5-EU	Z2N-7007	Check 10	64			A1	S10	4	1
11	F5-EU	35012/001		**121111	E603	P	N	S4	1,5	1
35	F5-EU	35062/001		**531111	E603	P	N	S4	3	1,5
51	F5-EU	35090/001		**181111	E606	P	N	S4	3	1,5
53	F5-EU	35092/001		**281111	E606	P	N	S4	4	1,5
55	F5-EU	35094/001		**241111	E606	P	N	S4	4	1
59	F5-EU	35106/001		**361111	E606	P	N	S4	3	1
61	F5-EU	35110/001		**411111	E606	P	N	S4	3	1
65	F5-EU	35114/001		**461111	E606	P	N	S4	4	1
67	F5-EU	35116/001		**431211	E606	P	N	S4	3	1
69	F5-EU	35124/001		**511111	E606	P	N	S4	4	1,5
71	F5-EU	35128/001		**531111	E606	P	N	S4	4	1,5
75	F5-EU	35136/001		**631111	E606	P	N	S4	3,5	1,5
79	F5-EU	35146/001		**691111	E606	P	N	S4	4	1
85	F5-EU	35174/001		**331211	E611	P	N	S4	2,5	1
87	F5-EU	35178/001		**351111	E611	P	N	S4	2	1,5
111	F5-EU	35224/001		**191211	E613	P	N	S4	4	1,5
137	F5-EU	35272/001		**111211	E614	P	N	S4	5	1
141	F5-EU	35282/001		**191111	E614	P	N	S4	3,5	1,5
145	F5-EU	35292/001		**231211	E614	P	N	S4	4	1
149	F5-EU	35296/001		**271111	E614	P	N	S4	3,5	1
151	F5-EU	35298/001		**281111	E614	P	N	S4	4	1,5
157	F5-EU	35302/001		**321111	E614	P	N	S4	3,5	1
159	F5-EU	35304/001		**341111	E614	P	N	S4	3	1
163	F5-EU	35310/001		**371111	E614	P	N	S4	3,5	1
165	F5-EU	35314/001		**411111	E614	P	N	S4	3	1,5
169	F5-EU	35322/001		**491111	E614	P	N	S4	3	1
171	F5-EU	35324/001		**501111	E614	P	N	S4	2	1
175	F5-EU	35332/001		**601111	E614	P	N	S4	3	1

EV= early vigor (1= fast development ; 9= slow development); GIMP=general impression of line (1=very good, 9=very bad)

## Restorer Pool Development (R-Lines)

In total 12 populations with 198 sublines were tested on different agronomic traits. 58 Lines could be selected based on the information from Germany (cold tolerance) and Italy (WUE). Produced seed inside these lines were sent to the winter breeding station in Porvenir/Chile. For the selection of the best material inside the Restorer-pool all selected lines were planted for evaluation in Germany (ZM12-S3M-EU), France (Z12-S3MFr) and Italy (ZM12-S3M-EU). The best performing R-Lines are listed in table 2.

**Table 2: Best performing Restorer-Lines in comparison to the check rows (Check 1-10)**

ID	PROG	IDT	INB_CODE	GENOTYPE	DER	PLASMA	GENEF	EV Germ.	EV Italy	GIMP 03.08
1	ZM12-S3M-EU	ZS0-458501	Check 1	1Z2134		N	S10	1,5	1	1,5
2	ZM12-S3M-EU	ZS1-458101	Check 2	3Z60044-11131311		N	S6	2,5	3	2,5
3	ZM12-S3M-EU	ZS1-458201	Check 3	7Z1697		N	S10	1,5	2	1,5
4	ZM12-S3M-EU	ZS1-458301	Check 4	7Z1699		N	S10	2	2	2
5	ZM12-S3M-EU	ZS0-458901	Check 5	7Z1764		N	S10	2	2	1,5
6	ZM12-S3M-EU	ZS0-458101	Check 6	7Z1785		N	S10	1,5	1	4
7	ZM12-S3M-EU	ZBP-1603	Check 7	7Z1858		N	S10	2	2	2
8	ZM12-S3M-EU	Z2P-6504	Check 8	7Z60092-152*		N	S4	2	2	1,5
9	ZM12-S3M-EU	Z2P-6505	Check 9	7Z60094-186*		N	S4	2	2	1,5
10	ZM12-S3M-EU	ZS1-458401	Check 10	9Z1226		N	S10	2	2	4
11	ZM12-S3M-EU	ZS0-459001	Check 11	9Z2002		N	S10	2	2,5	4
43	ZM12-S3M-EU	ZC2-36042/001		3Z60171-11211	IS 30441B x KELLER	N	S3	3	2	1
59	ZM12-S3M-EU	ZC2-36067/001		3Z60172-112211	IS 30441B x IS 30435	N	S3	1,5	1	1,5
72	ZM12-S3M-EU	ZC2-36084/001		3Z60173-11311	IS 30441B x IS 30308	N	S3	1,5	1	1
103	ZM12-S3M-EU	ZC2-36134/001		3Z60179-11211	IS 30435 x IS 30451	N	S3	1,5	1	1
108	ZM12-S3M-EU	ZC2-36145/001		3Z60179-113211	IS 30435 x IS 30451	N	S3	1,5	1	1
129	ZM12-S3M-EU	ZC2-36176/001		3Z60181-112311	IS 30435 x IS 30308	N	S3	2	1	1,5
130	ZM12-S3M-EU	ZC2-36177/001		3Z60181-112411	IS 30435 x IS 30308	N	S3	1,5	1	1
132	ZM12-S3M-EU	ZC2-36182/001		3Z60181-113511	IS 30435 x IS 30308	N	S3	1,5	1	1,5
135	ZM12-S3M-EU	ZC2-36188/001		3Z60181-114711	IS 30435 x IS 30308	N	S3	1,5	2	1,5
136	ZM12-S3M-EU	ZC2-36189/001		3Z60181-114811	IS 30435 x IS 30308	N	S3	1,5	1	1
138	ZM12-S3M-EU	ZC2-36194/001		3Z60181-115911	IS 30435 x IS 30308	N	S3	1,5	1	1,5
139	ZM12-S3M-EU	ZC2-36195/001		3Z60181-116011	IS 30435 x IS 30308	N	S3	1,5	1	1
150	ZM12-S3M-EU	ZC2-36219/001		3Z60182-114711	IS 30435 x IS 30441B	N	S3	1,5	1	1,5
159	ZM12-S3M-EU	ZC2-36235/001		3Z60184-112111	IS 30351 x IS 30308	N	S3	1,5	1	1
161	ZM12-S3M-EU	ZC2-36239/001		3Z60184-113111	IS 30351 x IS 30308	N	S3	1,5	1	1
162	ZM12-S3M-EU	ZC2-36240/001		3Z60184-113211	IS 30351 x IS 30308	N	S3	1	1	1
165	ZM12-S3M-EU	ZC2-36245/001		3Z60184-114611	IS 30351 x IS 30308	N	S3	1,5	1	1
168	ZM12-S3M-EU	ZC2-36249/001		3Z60184-115611	IS 30351 x IS 30308	N	S3	1,5	1	1
169	ZM12-S3M-EU	ZC2-36252/001		3Z60185-11111	IS 30308 x IS 30351	N	S3	1,5	1	1
170	ZM12-S3M-EU	ZC2-36253/001		3Z60185-11211	IS 30308 x IS 30351	N	S3	1,5	1	1
187	ZM12-S3M-EU	ZC2-36276/001		3Z60188-11911	IS 30308 x IS 30435	N	S3	1,5	1	1
193	ZM12-S3M-EU	ZC2-36284/001		3Z60188-113511	IS 30308 x IS 30435	N	S3	1,5	1,5	1
195	ZM12-S3M-EU	ZC2-36286/001		3Z60188-113911	IS 30308 x IS 30435	N	S3	1,5	1,5	1,5

EV= early vigor (1= fast development ; 9= slow development); GIMP=general impression of line (1=very good, 9=very bad)