RESEARCH ON RELATIVE RESISTANCE OF DIFFERENT VARIETIES OF SUNFLOWER TO DOWNY MILDEW " PLASMOPARA HELIANTHI NOVOT " IN GREEN HOUSE AND IN THE EXPERIMENTAL FIELD TESTS.

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Abstract.
For evaluation of relative resistance of different varieties of sunflower to Plasmopara Helianthi many research worcks were done in Iran according to the combined methods of A.Y.Panchenko, and P.P.Ilatovskii, and also by personal experience of author in green house tests and field experiments.In field experiments at 1983, different varieties were examined on the soils which were naturaly infected by the oospors of the fungus,to see and control resistance or susceptibility of tested varieties, after these examinations the tested varieties were grouped by Duncan's method.

Introduction.

Downy mildew of sunflower had been found in local varieties first at west - Azerbaidjan, and there was no information about disease from northern parts Iran untile 1971 ,for the first time it was observed at April 1971,in north of Iran on the seeds which was brought from Romania, and within the next year the disease increased in most parts of country,as because the best method to control the disease is to cultivate resistant varieties, for this purpose different experiments were carried out in green house and fields.

Materials and methods.

1) in green house experiments: Materials used were as wooden boxes(10x45x65)- sterile and infected soil samples- green house with controlled temperature an light and humidity - seeds- laboratory instruments to prepare zoospore of disease for inoculation , and so on, at this experiment for inoculating by zoospore in hypocotile stage , the combined methods of Panchenko.,Ilatovskii and author was used.After obtaining the results to secure that ,the resistance of selected resistant plants are not depending to the climate condition or any otherfactor,these selected resistant plants were tested again by some laboratory controls:

a) observating morphology of fungus and estimated changes by fungus on plant tissues under microscop.

b) direct observation of fungus on leaves by chemicalizing and colouring the leaf tissue.

c)direct observation of leaves tissues to see if there are any changes.

2)field experiment : at 1983-84 , field experiments to test the resistance of varieties were carried out by complet randomized block design,and the treatments of experiment were ,11 inbred lines and varieties:
R-1=C , R-28=D , R-43=E , R-45=F , R-46=G , Cus26xR-28=H , Cms60xR-1= K
Cms60/32xR-46=M , Cms64xR-43=L,var, Chernianka66=B, Record =A .
Each treatment was one plot 2x3m, with 3 replications , in each plot 4 rows were planted with 25c/m distance, the experiment was conducted at10/3/1983 in naturaly infected field in Gorgan(north Iran),climate conditions as temperature, humidity, and precipitation rate during experiment year in Gorgan are indicated on attached Figs(1),(2).

Results and discution.

The results of experiment after statistical calculations are indicated on attached tables(3),(4),(5),(6).

Description of tables:

Table(3): Percentage of infected plants, and germination power of seeds.
Table(4): Mean percentage of infestation of11treatments in 3 replications.
Table(5): Analysis of variance.
Table(6):Duncan's Multiple range test.

According tables(4),(5) there are significant differences between treatments and by Duncan's table(6) and grouping the treatments, it is observed that the treatment F is in first stage with 100% resistance, and after that,treatments D,M,G,E, are stable and tolerant inbreds and lines against downy mildew of sunflower,and as long as the new resistant varieties are not developed,these varieties(D.M.G.H.) can be cultivated in infested areas.

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Table3 . Percentage of infected sunflower varieties in the experimental field of Gorgan in 1983

Column ردیف	Variety واریتـــــــــــه	Total Plants کل بوته سبز شده	% of germination درصد قوه نامیه	% of infection درصد آلودگی	Remarks ملاحظات
1	R-1	257	80.76	21.92	planting date:
2	R-28	293	93.91	0.37	1361.12.21 =
3	R-43	301	96.47	0.61	11.03.1983
4	R-15	222	71.15	0.00	temperature:
5	R-46	170	54.48	0.45	8 - 34°C
6	CMS-26 x R-28	240	76.92	12.24	R.H. :
7	CMS-60/61 x R-1	200	64.10	36.69	25 - 91 %
8	CMS-60/32 x R-46	279	89.42	0.39	total-
9	CMS-64 x R-43	256	82.05	38.46	precipitation:
10	Chernianka-66	284	91.02	55.65	152.40 mm
11	Rekord	286	91.66	60.81	

Fig.(1).Average temperature & relative humidity-1983

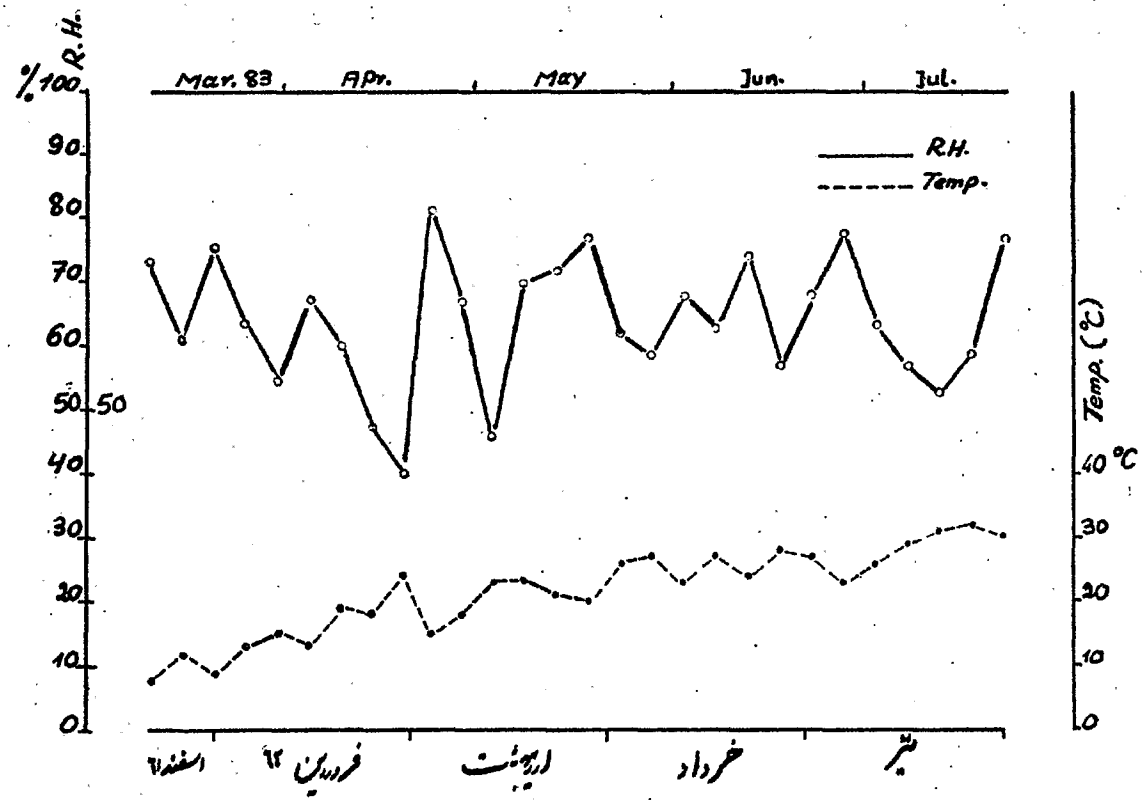
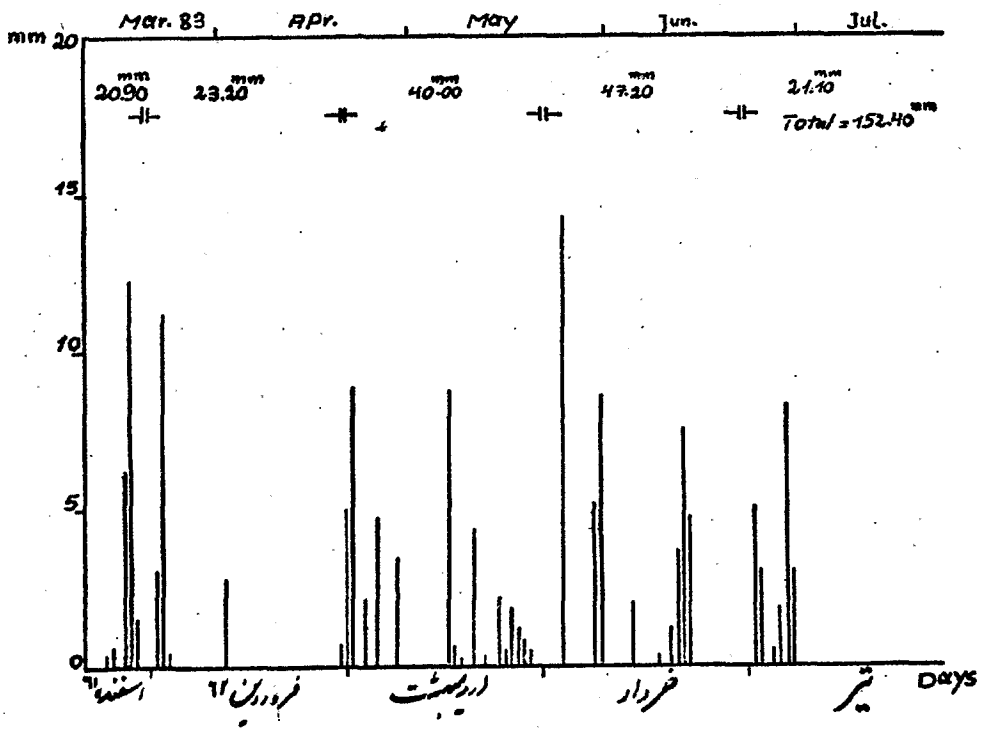


Fig.(2).Precipitation rate in Gorgan - 1983



جدول شماره ۵ — تجزیه وتحلیل آماری واریانس جدول شماره

Table 5. Analysis of variance

منبع تغییرات S.V.		درجه آزادی D.F.	مجموع مجذورات S.S.	واریانس M.S.	محاسبه شده F	F جدول %5	F جدول %1
کل	Total	32	19370.043				
تیمار	T	10	16630.065	1663.006	** 12.29	2.35	3.37
بلوک	R	2	17.155				
اشتباه	E	20	135.28				

** = 0.01 > P > 0.001

موسسه بررسی آفات و بیماریهای گیاهی

جدول ۴ — میانگین درصدآلودگی ۱۱ تیمار باسه تکرار

Table 4. Mean percentage of infestation 11 treatments and 3 reps

تکرار Reps / تیمار Treatments		I	II	III	معدل $\bar{X}$
R-1	= C	22.61	12.69	30.47	21.92
R-28	= D	00.00	00.00	1.12	0.37
R-43	= E	00.00	00.00	1.83	0.61
R-45	= F	00.00	00.00	00.00	00.00
R-46	= G	00.00	00.00	1.36	0.45
CMS-26 x R-28	= H	00.00	33.02	3.70	12.24
CMS-60/61 x R-1	= K	40.24	22.38	47.47	36.69
CMS-60/32 x R-46	= M	1.19	00.00	00.00	0.39
CMS-64 x R-43	= L	32.35	23.25	59.80	38.46
Chernianka 66	= B	70.32	60.18	36.17	55.65
Rekord	= A	72.22	60.82	49.41	60.81

جدول شماره ٦ — گروه بندی تیمارهای مورد آزمایش بر حسب

Duncan's Multiple range test

Table 6

تیمـــار های مـــورد آزمایش Treatments		میانگین % infestation	اختلافات آماری طبق روش Duncan's Multiple range test
Rekord	= A	60.81	
Chernianka 66	= B	55.65	
CMS-64 x R-43	= L	38.46	
CMS-60/61 x R-1	= K	36.69	
R-1	= C	21.92	
CMS-26 x R-28	= H	12.24	
R-43	= E	0.61	
R-46	= G	0.45	
CMS-60/32 x R-46	= M	0.39	
R-28	= D	0.37	
R-45	= F	00.00	