Pathological studies on powdery mildew of flax in a.r.e

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The results of the present study could be sununarized in the followingpoints:1. Powdery mildew of flax was surveyed in three flax-growinggovernorates in middle Delta (El-Gharbiya), north Delta (Kafr El-Sheikh), and east Delta (Sharqiya). Disease incidence and diseaseseverity were used as criteria for evaluating disease intensity in thesurveyed fields. The three governorates did not significantly differ indisease incidence and disease severity. Prevalence of the disease wasevaluated within each governorate. Six locations were surveyed in El-Gharbiya and 3 locations in each of Kafr El-Sheikh and Sharqiya). Theonly significant differences in disease incidence and disease severitywere observed within El-Gharbiya and Sharqiya, respectively. Thehighest disease incidence level of EI-Garbiya Governorate observed inSanta, while the lowest disease was observed in EI-Gemmeiza. Thelowest levels of disease severity in EI-Sharqiya were observed in MernaEl-Kamh and Ibrahimia, while the highest levels were observed inDiyarb Nigm and EI-Qanayat.2. Oidium lint has three distinct morpho types differ in shape of conidia:cylindrical conidia (morphotype 1), bullet-shaped conidia (morphotype2), and barrel-shaped (morpho type 3). Morphotype 3 was neverobserved on the field-grown plant during the growing season. It wasobserved only on greenhouse-grown plants in September and October.The occurrence of this morphotype was restricted to cotyledons andnever spread to true leaves. It caused sever stunting followed by quickdeath of the infected plants.3. The teleomorph of 0. lini was identified by evaluating the relatednessbetween 0. lini and some anamorphs of powdery mildew fungi whoseteleomorphic taxonomy is well established. Three methods were used inthe evaluation. They were: (1) biostatistical analysis of somequantitative morphological traits. (2) Serological interactions. (3)Sodium dodecyl sulfate-polyaclylamide gel electrophoresis (SDSPAGE)of proteins. The obtained results of the three methods revealedthat morpho type I and 2 belong to Erysiphe polygoni while morphotype3 belongs to E. cichoracearum.4. The influence of temperature and relative humidity (RH) onconidiospore germination and germ tube elongation of 0. lini wereevaluated on glass slides incubated at different combinations oftemperatures and relative humidities. Germination of conidia as well aselongation of germ tubes occurred over a wide temperature range from5-30°C; however, maximum spore germination and germ tubeelongation occurred at 25°C. Spore germination and germ tubeelongation occurred from 5.2 to 100% RH with an optimum of 100%RH for the two variables.5. A diverse group of compounds were evaluated for control of flaxpowdery mildew on Giza 7 and Giza 8 flax cvs. under field conditionsin 1995 and 1996, respectively in Salcha and El-Gemmeiza. Diseaseintensity variables (01 and DS) and agronomic traits were used ast26criteria for evaluating the tested compounds. These compounds includefungicides (TFS, Bayfidan, Bayleton, and Rubigan), Filrn-Formingpolymers (Nu-Film 17 and Super Film), and bicarbonate salts (Sodium,potassium and anunonium bicarbonates). Bayfidan and Rubigan werethe best performing compounds in controlling flax powdery mildew. Ofthe eight sprays applied over the two years in the two locations,Bayfidan significantly reduced disease incidence seven times (87.5%),and disease severity five times (62.5). Rubigan significantly reduceddisease incidence SIX times (76.0%), and disease severity five times(62.5). Bayfidan and Rubigan showed high level of efficiency inreducing disease incidence and disease severity after the second sprayover years and locations.6. Thirteen sowing dates were evaluated as to their effect on powderymildew intensity variables and yield of flax cultivar Giza 5 in

anoutdoor pot experiment. It was evident that powdery mildew intensityvariables reached maximum levels on young plants (late sowing dates)and decline considerable on adult plants (early sowing dates). Theintensity of the disease on young plants was significantly reflect ondeterioration of seed and straw production. According to the findings ofthis study, flax should be sown during November to minimize the lossesin seed and straw production but not disease intensity.7. Ten flax genotypes were evaluated under field and greenhouseconditions for powdery mildew resistance. genotypes 8 (110/3) and 9(282/37/14/8) showed the highest level of susceptibility to the disease.In the second year. However, they maintained high level ofproductivity, thus, sh-aw yield and seed yield of these two genotypesdid not significantly differ from Giza 7. Under greenhouse conditions,these two genotypes were more susceptible to the disease than Giza 7.However, their straw yield was higher than that of Giza 7, Takentogether, it seems reasonable to conclude that these two genotypes aremore tolerant to the disease compared to Giza 7.8. Nine clay soil samples were obtained from different flax-growing areas.The relationships of flax powdery mildew to 22 physical and chemicaledaphic factors of these soils were studied by simple correlation. It wasfound that EC, Ca++, Na+. Cl, and N were positively with correlatedwith disease incidence, Iron and coarse sand were positively correlatedwhile K+ and Mg++ were negatively correlated with disease severity.He03 was positively correlated with straw weight/plant. These resultssuggest that intensity of flax powdery mildew could be reduced byavoiding excess nitrogen fertilization and by addition of potassium ormagnesium to the soil or foliar sprays.9, Effects of seed rate, nitrogen fertilization and phosphorus fertilizationon intensity of flax powdery mildew were studied under fieldconditions in 1995 and 1996. Effect of phosphorus fertilization ondisease incidence in] 995 was variable depending on seed rate. Ingeneral, the overall means of all levels of phosphorus fertilizationcaused significant reductions in disease incidence. The overall means ofnitrogen levels revealed that significant reduction were obtained by allnitrogen rates except the rate of 70 kg/feddan, which was ineffective inreducing disease severity significantly. In 1996, seed rate, nitrogen rate,phosphorus rate, and their interactions were all nonsignificant sourcesof variation in disease incidence and disease severity. Evidently,nitrogen fertilization was important sources of variation in most of thetested agronomic traits each year. Non of the tested agronomic traitswas affected by seed rate each year. Phosphorus was significant sourceof variation in straw yield/feddan only in 1995. Economically, the besttreatment in 1995 was SIN1PO because this treatment consisted of thelowest seed and nitrogen rates and did not require the application of anyphosphorus. At the same time, this treatment did not significantly differfrom the highest seed yield of S4N3P1. That is, the application of thistreatment would save 45 kg of seeds, 30 kg of nitrogen and 15 kg ofphosphorus without any significant loss in seed yield.