Physiological and biochemical effects of cotton plant as aresult of spraying with some insecticides fungiciddes and herbicides

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For this study three The main objective in this investigation wastc study the physioloeical and biochemical effects ofVitavax Captan as fu~icide~ Fluometuron and Trifluralinas herbicides, ane Drospan and Lanit as insecticidES,on Giza 69 cottar variety.lines of experiments, in the laboratory, the greenhcuseand the field WEre conducted.1. Laboratory eXferiments :Seeds of cottcn were soaked in fungicide andhErbicides solutions in water at the rate of 1/10 oftte field recommended rate. These soaked seeds wereplanted, half in Petrj dishes and the other half in10 em diameter pots. The germination percentage, radiele+ hypocotyle, reot and stem lengths, aeedLf.nglengths, and dry weigbts were all meausred.2. Greenhouse ex!eriment:The seeds werE planted in }O em diameter claypats and treated with the pesticides at the rate of2/3 the field recommended rateo The pesticides wereafplied individually ar in combinations. The data ofgermination percentagE, root length, stem length (planthieght), dry weight/plant, and the chemical analysis oft.le cotton leaves at the age of 45 days were all recor-Ie d ,Field ex~rim~nts : Field exp.was carried out in the experimentalesa t Lon farm 0 f the A?;ric. Research Centre 0 f Gizadllring 1978 and 1979 3eaSOns. The pesticides werea)plied in different ~ombinations as the recommendedrates and time. The effect of combined pesticideson growth and yield 0 f cotton plant were studied. Leafa.id seed analysis for all chepri ca.l contents were dete-.rrni.ned ,The results ob tad ned can be summerized in thefollowing: -(1) The laboratory experiment~:The germiaation percentages and the radi-C:.8 + .bypocotyle Lengjhs in petry dishes were reducedb~' soaking seeds in p€~sticide solutions, except VitavaxCe.pt an which gave an :.ncrease.The root and ~,temlengths and dry weight/plant,of plants grown in poi s, were increased by soaking seedsill Vitavax and }!~luomehl..ron and their combinations,whileTl'ifluralin and its ccmbination with Vitavax caused arE duction.(2) Green house experiment:Germination percentages were significantly reducedby the application of combine d fungicide with ner»bi cides.Plant hiehgt was significantly increased onlyby the application of :Eluometuron alone Dry weight/plart was increased by fungicide andherbicide applications. The insecticides caused a reduction.The herbicides and Lanit treatments increasedthe total chlorophyll in the cotton leaves, while thefurgicide and Drospan ehowed a reduction All pesticide treatments increased the totalcarotenoids, as comparEd to control.The pesticide applications had no clear effect on the mineral content of the cotton leaves.The total carbchydrates content was increasedby the pesticide applications, except Trifluralin whichcacse d a reduction.Generally, the pesticide treatments tended toThe fungicide and herbicides tended to increasethe reducing sugars content, while the insecticidescaused a reduction.reduce the phenol com~ounds in the cotton plant comparedto control.The total aminJ nitrogen was generally, reducedby the pesticide treatnents as compared to control.(3) Field eXEeriments:Germination percentages were decreased signifi~antly by the applic~tion of Trifluralin and Fluometur)n in 1978 season, and Vitavax Captan + Trifluralinin 1979 season as compared to the contro1.The plant hight, generally, was increased bythe pesticides treatments as compared with the controles~ecially at the plant age of 90 days. The increame~t was significant o~ly at plant age of 45 days in1979 season.The application of pesticides showed an increaasin dry weight/pl.an~ at the plant age of 45 days in19'r9 season, as compar-ed to control, the

differencesweJ’e significant. At the plant age of 90 days theef:~ect bad the opposi tl!trend with insignificantdi:~ferences•The pesticides treatments had no clear effecton stand count as compar-ed to control. The differen~es between treatments and control were not signifi~ant. The application of herbicides and insecticidestended to increase thE yield of seed cotton in kentar/feddan as compared with the control, while vitavax captentended to decreasE the yield but the differencesWEre not significant.The pesticidef treatments had no deffiniteffect on the average of boll weight in both seasonsau compared with corrt roL, The differences betweenthe treatments were not significant.The pesticide,3 applications, generally, causeda reduction in lint p~rcentage values as compared witht .ie control. The re Iuctd.o n was more pronounced in1’379 season.The pesticides treatments had no diffeniteffect on seed index a~[compared with control, the diffeJ’enceswere not sign.:i.ficant.The applieatioJLS with pesticides, generally,showed a reduction in the earliness percentage, asconpared with the corrt ro L, the differences were significantonly in 1979 lleason.Fineness (Micremire values) and strength(PJ~essely index) were lIot affected by insecticidesapplications The chlorophyl:. a content of the cotton leaventended to increase by fungicide and herbicidesapplications at the ages of 45 and 90 days in 1978aeuaon, while their ef:’ect was the reverse in 1979seuson, The insecticicles caused a reduction in chlorophylla content in 1~178season but the effect was thl~ opposite in 1979 spason.Vitavax Captan and Trifluralin reduced chloroprll b content in the cotton leaves at the ages of45 and 90 days in both seasons as compared to the control. The insecticides increased chlorophyll bcontent at the age of :-10 days while at 125 days oldthu results were the opposite.Fungicide and terbicides applications individue,lly or in combinaticns, increased the total chloro~hyll content of the cotton leaves at the ages of45 and 90 days in 1978 season, while their effect tendec.to be the opposite in 1979 season. The insecti’"cicies t generally, tende d to increase the total chlorophyllin both seasons.Vitavax Captan, Trifluralin and Flurometuront er.ded , in general, to increase the total carotenoidscontent of the cotton leaves at the ea.rly stages in191’8 season, while the effect was the reverse in 1979aes.so n, The insecti cj des, generally, caused a reducti(ln in total carotenoids in 1978 season,while showedan increase in 1979 aeaaon;The fungicide and herbicide treatments tended to increase the total llitrogen content in the cottonleHves at the early sthges in both seasons as comparedwi trh the contro 1. ThE insecticides however, had nocLua.r trend.Vitavax capten Trifluralin and Fluometuroncaused an increase of -;he total P content of theCO”itonleaves at the e~,rly stages in 1979 season, as- compared with the contr)l. Drospan treatments showeda reduction of P content at the ages of 110 and 125days in both seasons.Generally, pota3sium content of cotton leaveswas increased at th? age of 45 days in bothseasons, by using the fungicide and herbicides. Theinsecticides however, h~d no clear effect on potassiumcontent.The fungicide and herbicides tended to increasethe total carbohyirates in the cotton leavesat the age of 45 days in 1978 season, while at 90days the carbohydrates content was decreased, as comparedto control. The insecticides tended to decreasecarbohydrates in 1978 season. All pesticideshowever, had no clear effect in 1979 season.The total phenols content in the cotton leaveswas increased at the ag~ of 45 days in 1978 by applyingfungicide and herbiiides, while at the age of 90days the same mentioned pesticides caused a reduction.In 1979 season, the resllts were the opposite. The insecticidesshowed in ge~eral, a reduction of total phenoLsas compared with t 1.e control.Genera.lly, the polyphenals content of the cet uon leaves, at the e~rly stages, was increasee byusing the fungicide Me, herbicides in both seasonsas compared with the cOlltrol, while the insecticidesshowed the opposite effE~ct.Vitavax captan, Trifluralin and Fluometuron, genl~rally, increased thE! reducing sugars in thecotton leaves at the ea:~ly stages in both seasonsas ’~omparedvv:i th the contra 1. Moreover, the insectic:Ldes caused a reduct:.on in reducing sugars in bothsea:Jons The fungicide ahd herbicides and the Lns ect Lecf.d as applications t ended to decrease the total aminonitrogen content of cotlicn leaves at the age of 45day 3 as compared with the control in both seasons.Seed oil conterr~ and quality was not affected by the pesticide app.l.i.catd ona.