Response of egyptian cotton to some managment practices under different levels of irrigation

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Three field expriments were carried out at the Researchand Experimental Station of the Faculty of Agriculture atMoshtohoT, Zagazig University, Kalubia, Egypt, during 1981,1982 and 1983 seasons. The intention was to study the effectof delaying sowing dates and the absence of some irrigationsduring the different stages of plant growth on yield, earlinessand fiber and yarn properties .A split-plot design with four replications was used.Th e t h ree sow i n g d ate 5 i _e ., Mar chI!!..!..,ApT'ill st. and "1ay 1s t.were applied in the main plots . The sub-plots were devoted to8 irrigation treatments as followsB L- Control: It is worth mentioning that the control treatmentswere 10,9 and 8 irrigations, for the first, thesecond and .the third' planting dates, respectively-B2- Without the first irrigation .B3- Without an irrigation at the beginning of flowering stage.B4- Without an irrigation at the beginning of fruiting stage.B5- Without the first irrigation and an irrigation at thebeginning of flowering stage.B6- Without the first irrigation and an irrigation at thebeginning .d fruiting stage.B7- Without an irrigation at the beginning of flowering stageand an irrigation at the beginning of fruiting stageB8- Without the first irrigation~ an irrigation at the beginningof flowering stage and an irrigation at the beginningof fruiting stage .It is rather interesting to note that the first irrigationwas given after 30 days from sowing date. The other irrigationswere applied at IS-day intervals. Other cultural practiceswere done according to the system usually followed inKalubia district. The sub-plot area waS 10.5 m2.(1/400 fed.)with 5 rows; each row was 3.5 m. long~ 60 em. apart and hillswere spaced at ZO em. apart. The plants were thinned to twoplants per hill after 45 days from sowing time . ~alcium superphosphate (16% PZOS) at a rate of 24 kg. P205 per feddan wasapplied immediatly before the first irrigation . The nitrogenfertilizer (ammonium nitrat~ 33.5 X) was applied at a rate of50 kg. N/fed. just"before the second irrigation. The Egyptian" .long staple variety Giza 75 (£.barbadense) was used as amaterial in the present study . This variety was derived froma cr0&S between the two Egyptian varieties Giza 67 and Giza 69.Giza 75 is a high yielding variety baving higher yarn strengthas compared withit8"parent~ . It is also characterized byhigh lint percentage which is slightly lower than Giza 69variety. The plots were picked twice. the first picking wasdone 40 days after the first boll opening and the second onewas done 20 days. after the first picking .Studied Characters :The growth attribu~es~ earliness, yield~ yield componentsand fiber and yarn properties, were studied in the presentinvestigation. The results, obtained could be summarized asfollows :(A) Growth Characters1. There was a tendency of increase in germination i.as a result of delayi~g sowing date. This trend wasthe same in all the three seasons involved in thes t u dy •2. The plant height tended to decrease significantlywhen the sowing date was delayed in all the threeseasons under study. It was also found that therewas a tendency of decrease in plant height as aresult of reducing the numbe~ of irrigations, givento the plants •3. The delayed date of sowing resulted in decreasingthe number of fruiting branches per plant. Thistrend could be seen during the three seasons. Theirrigation treatments showed an insignificant effecton the number of fruiting branches per plant4. ~he number of vegetat~ve branches per plant tendedto decrease significan~ly when the planting datewas delayed in two seasons out of three . The effectof irrigation treatments on the number of vegetativebranches per plant was not significant in all seasons.(B) Earliness:.1. The delaying in planting date caused a marked reductionin the number of days to the first flower appearanceand th~ first boll opening . There was a generaltrend of decrease in the days

to the first flowerand the first boll opening whenever the number ofirrigations decreased .2. The height of first fruiting branch tended to increasesignificantly as the planting date was delayed . Thedecrease in the number of irrigations did not affectsignificantly the height of first fruiting branch.(C) Yield and Yield Components :1. The number of open bolls per plant tended to decreasematerially when the plants were grown late in April orin May. The absence of the first irrigation did notsignificantly affect the number of open bolls perplant • However, the absence of an irrigation eitherbefore the flowering stage or the fruiting stageres~lted in decreasing the number of open bolls perplant . whereas ~he absence o£ two irrigation$obviously reduced this character . In fact thelowest number of open bolls per plant. was obtainedwhen three irrigations were absent .2. The earlier sowings resulted in a higher bollweight • It was clear that the absence of the firstirrigation did not result in a significant differencesamong the averages of boll weight as comparedwith the control. However. whe~ an irrigation wasnot given eithet before flowering stage or fruitingstage, .the boll weight si gnifieant 1y dec rea sed . Theabsence of two irrigations, distinctly reduced theboll weight. However, the lowest boll weight wasobserved when th~ee irrigations, were not given.3. The plant stand evidently increased when the seedswere sown late. Irrigstion treatments did not revealany significan~ effect on plant stand4. SeeJ cotton yield per plant was substant~ally reducedas a result of late planting. Irrigation treatmentsproved to have a pronounced effect on seed cottonyield per plant a8 indicated by the fact that theabsence of anyone irrigation tended to significantlydecrease seed catton iield per plant compared withthe control . This tendency was more evident as thenumber of absent irrigations was increased .The latesow~ng dates tended to decrease the seedinde~. It is clear, however that the plants grownin April and May did not differ significantly regardingtheir seed index, but they w~re generally oflower seed index values than those grown earlier inMarch. When the first irrigation was not given theseed index was not significantly affected .On .th. other hand, the absence of an irrigationeither before the flowering stage Of th~ fruitingstage slightly reduced the seed index. This patternwas true when two or three irrigations were notgiven. ’However. the differences between the irri~gation treatments were generally small .6. ’The lint percentage was found to be significantlyreduced wh~n the sowin~ date was delayed . Irrigationtreatments had no significant influence uponthe lint percentage7. There was no sign~ficant difference between theaverages of seed cotton yield/feddan when the plantswere grown· in March or AprilOn the co~trary. a ~arked reduction Ln yield wasregistered when the plants were grown late in May.The same pattern was true regarding lint yield perfeddan. The absence of anyone irrigation resultedin a significant decrease in both seed cotton yieldand lint yield per feddan . However. when two irrigationswere absent this tendency of dec~ease wasmore pron6unced • In fact. the lowest seed cottonyield and lint y~eld per feddan were obtained whenthree irTigations were not given .8. There was no significant differences between theaverages of seed yield per feddan when the plantswere grown in March or April. However. the plantingdate did not appear to have any significant effecton oil percentage • whereas the oil yield per feddansignificantly increased when the plants were grownin April as compared with those grown in March.On the other hand when the planting date wasdelayed till Maya quite size.able reduction in seedyield and oil yield per feddan was found . Irrigationtreatments, had no evident. effect on oil percentage.When an irrigation was not given, a significant decreasein seed yield per feddan was found. However.the magnitude of reduction in seed yield was dependenton the time at which that irrigation was notgiven. It is obvious that the tendency of decrease inseed yield was clearer as the number of absent irrigationsincreased .In regard to the effect of irrigation treatmentson oil yield per feddan, it was found that when thefirst irrigation was not given, no significantdifference 1n oil yield was observed, while theabsence of an irrigation either before floweringstage or fruiting stage caused a significant reductionin oil yield. ltis clear, however that theoil yield tended to decrease progressively as thenumber o~ absent irrigations increased. This. wasindicated by the lowest oil yield obtai~ed whenthree irrigations were not given .(D) Fiber and Yarn Properties :1. Fiber 2.5% S.L., 50% S.L. and length uniformityratio, were not found to be significantly affectedby planting date. Irrigation treatments did not revealany dlstincteffect upon fiber length characteristics.2. Fiber tensile properties i.e. tenacity, elongation ,toughness and stiffness did not .appear tQ be significantlyinfluenced by planting date. Also irrigationtreatments proved to have an insignificant effect onfiber tensile properties .3. Planting date

exhibited insignificant effects on bothpercent reflectance (Rd %) and degree of yellowness(+ b) in 1981 and 1982 seasons.. Howev~r, in 1983season, it was found that percent reflectance tendedto decrea~e significantly when planting date was,.’ := ~-. ”-’;- 86 -delayed. The reversed pattern was true regarding. -’;”’, the degree of yellowness (+b). ~here i~ wasobserved that (+b) values significantly increasedwith delaying planting date in 1982 season • Irrigationtreatments had no significant effect oncotton colour measurements .4. There waB a general tendency of decrease in Micronairereading in the two seasons 1981 and 1982 asplanting date was delayed. However, planting dateshowed an insignificant effect on Micronaire’readingin the third season 1983. Irrigation treatments didnot show any significant influence upon Micronaireread ing .5. Lint cotton grade was not found to be significantlyaffected by planting date during two seasons .Howeverin 1982’ season, cotton grade declined gradually whenthe sowing date was delayed . Irrigation treatmentsdid not exhibit any significant effect on lint cottongrade .6. Planting date had no significant effect on yarnstrength expressed in terms of lea product in twoseasons. However, during 1982 season, yarn strength..... ’tended to diminish progressively when the plantingdate was delayed. Irrig~tion treatments. did·not show”,:’. any significant effect on yarn strength except in1982 season.7. Yarn appearance grade was not significantly affectedby planting date during 1981 and 1983 seasons . Thereversed pattern was true in 1982 season. but therewas no definite trend related to planting date . Infact the highest yarn appearance grade was obtainedwhen the plants were grown in April during thatseason .”~’,.Irrigation treatments did not show any significanteffect on yarn appearance grade .