physiological and chemical study on luisa plants

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The experiments includedExperimental Farm of FacultyZagaziig University and atseal-ch Center (NRC) at Giza .in this study weye carried out at t~~eof Agriculture Science at Moshtohor fthe Experimental Farm of National Re-TI1C :’~~perinlcnt inclL,lded studying the pYcpag~ticln of Lippiacitriodoya using some growth regulators namely IBA and NAA . U~if::~l”-;Tl Cuttj r:gs f rorn t~-!f:.:’ ’t s-rrm n e l and mi d d Le pl’::,.l”,’t pC!i·ti.;:~;r-·, ’”·.’C~l-E ::’:’dC’”.J’~”:~’:”::’;::; t::: ci ffc’rer:t: l_;’·c.c’,:n.c-”-.t:c. of IBt, ’:.0.c: ~ 150 f 25~:~ ,:,’(350 FPt’1 fin -y’Z!,tE·r col ut ior, z,nd C~O , 1500 , 2500 and 3500 F’PMin t,,~,lc pO~·,I--dEY~ and NAA (0.0 ,50 1r-(1 or 200 PPM in watEr solution and 0.0 ,500 , 1000 , 2000 F’F’Min t ,;;,1 c pOI,,·~lder)MClyeOVEr field experiments were performed in the two season to~3tudy the effects cof t~1e location factors and seasonal variation onthe growth, essential oil production and the oil constituentsThe effect of frequent harvesting on the yield of leaves andtwigs , oil production and oil constituents was studied as well asthe effect of foliar nutrition, using ”Foliatrian’l in four concentrationsas 0,2,3 and 4 mIlL was included.Lippia citriodc’Y2 oil was subjected to GLC, GCapillary CGanalysis and G2~ c~lYomatc,;YaphY-~25S spectc,metry GC-MS an51ysisBesides studying the effect of extraction metJ10ds on the percent2gcclf oil and oil cc,nstitL’e~ts ~as done.The most important results wereT __ EFFEI-:T OF 13F.:Ol,.-JTH F-~FC:iUL~T;OF:~; A!!D TYPES OF CUTT I rJ(3S ON THE PonT Tt-·,~(;PESPONSE •cr e a s e dT~,e application of lEAthe rooting pE’j-CentO::::ige of150 and 250 PPM significantlyLippia citriodora .i n--TIle middle pOl-tion cuttings treated with lBA at 250 PPM gavethe best rEsults of rooting and significantly irlcreased t}lS rootlength .IDA was more EffectivE on rooting of Lippia citriodora cuttings2S compared to NAA Especially when middle portion cuttirlg WGYE usedas when the growth regulators was used in aq~ous solution •2 In all cases, the middle ~~~-tiorl cuttings of Lippia cj,triodora rooted mort than terminal cuttings3- Generally application of growth regulators (lBA and NAA) intalc powder had slightly increased the percentage of rooted cuttings::.,I I ~ 1--EFFE’C’:T OF LDCATION FAC:TOF:~S :”1N THE C:.iPDWTJ-,1 fND OIL. F’F:DDL1CTTDr>JO~ LIPPIA CITRIODORA .Ttl0 cC’nditions of ~1osflt0hc~r lOC2tlO~j were favorable in compari-5 (-:’;’-i te, C:i:~2. ~’:;cz:.tic:’~·; sir’,::€-: ·I..t ;:~gh vc.I. ..:::’:’”~’:.<:...:;~ , pl,;:
t l”ic::i£,:ht ,nUfi~teY ~f branche~ plant leaf &rE2/~lant and frc anci C!lP/yield of leaves 2nd twigs ~JEYC recorded for MOS.ltohor plants cc,mparedwith Gi~a plants ~ On t~~e ether hand t ~h~plants growth atGiza gave hig~ler values of number of leaves per ’plar,t •r ; At full blooming stage (on S~ptember) , the higher percentageof Luisa oil was obtained fr-om thE’ j:.,li:.”1nt.,s. g~~own undf?,(the corrd i rtionsof l:ilZ2t location whETeasi the highest oil yield ””’1as:. obtainedfrom Giza location when the plants werE harvEsted in SeptembEr ~11.2. EFFECT OF SEASONAL VARIATION AND LOCATION ON THE YIELD OFLEAVES AND TWIGS , OIL PRODUCTION AND OIL CONSTITUENTS1- The maximum fresh and dry weights of leaves and twigs wasr-ecCtl”-ded during Oc tobe r at. Moshtoho’(i r: (Septeinb2’r-) 2t 13izl3.-, Plants at Moshtohorand twigs compared withproduced the hEaviestl3izi::1. location ~ofIrl both fresh and dr)! weigh~year old plants ttlenof 1eaves aridtwigs were maximum wit!1 the one declinEd withthe two year old plants ~4- There was gradual marked decrease in the oil percentage witht.le increased growt~l rate of leaves and twigs. The percentage ofoil reached its peak at the early stage of growth in the two locationsIn all cases plants at Giza location .1ad high oil percentagethan those in MoshtohorComparing the rEsults at the top oil yield production i~ twolocations , t~le plants of Moshtohor in both seasons gave t~E hig.lestyield of oil compared with Giza locationon6- ConCErningthe main of, t~le effect of seasonal

variation and locationoi I cc,nstituents UndeF the env.ir::!nmentalcorid i t ioneent=:- weYE’1oc,,:- t i c,n •elf MoshtohoY , tf1e highest valuesobtained on October, while itof tc,tal main constitllwason November at GizaIII EFFECT OF FREQUENT HARVESTING ON THE YIELD OF LEAVES ANDT~·!l CS 0 I L PPODUCT I ON AND elL CO!’-~ETI TI !ENTStE.inedThe’.•>henhigher frEsh and dry yield ofthe plants were harvested onceand.-, The highest ,:”,il yi eld .l-l’ K£:; ,·-.’as ob’tC’tinc:-:·d whE,n thE’ j:::lant~:;.were h2~vcsted 3 t12~ve~tscompaYE’,rj ””lithmer”lt •13.3 2.nd 10.0per f e dd enfi ’(st dndt<g/ fed danrecQrded 18.1 Vg/feddarl andsecond season respectivelyf~,y the c:rlE ~laYVest trea”l-:J... 1T:E’ t~j::)tEJ. cil yield15.6 ~:g!feddar1 d~l-ing the4- In senera} , frequent harvesting declined the total mainconstituen,:fs. of vol eti Le oil (Limonc;:e ~ l,E: C:in’:::,”’:ll and Citral)I~}- EFFECT OF FOLIAR NUTRITION ON THE GROWTH? OIL YIELD ANn OI~CC1l.1ST I TUE!TS1- Foliar spray with Foliatrin at the low level treatment 2mIll resulted in significant increase in the plant t,eight and frest”and dry weig~lts of leaves and twigs compared with other treatments’-:’-” T~le application of high level ofon increasinq t~le pCYCent2ge of theFoliatrian was very effecti ”·,n2 total cf main constituentsof vLat i Le- oiIV-ANALYSIS OF VOLATILE OILThe essential oil , obtained after steam distillation of theleaves and twigs of Lippia citriodor3 after; separation on a Silicagel column , was investigated by means of GLC/MS .1- The oil consisted of about 15.81%-Pinene , B-pinene , D-Limonenct~epresented thE monotet~penes ..hyd~ocaybon monotrepene3-Terpinene and Decan2 Longipinene -Cubeben, -Cedrene,and trans , Far2nsene were identified as.’.ydroc2rbons in Lippia citriodorB oilHumulene , Curcumenea new sesequiterpene3- 1,8 Cineol and Citral (a+b) were major oxygenated-compoundsThe oil of Lippia citriodor2 contained also Linallol , Ter~ineol 1Bornecil B-citronellal GeY2niol Decane 2 one Benzcnc--l-(1,5dimethyle -4-hexnyl -4--mct~lyl), CaYyop~·illcne oxide &nd6-Met!1yle-5-hepterl 2 one as a new components in Lippia citriodc1raoil’v’I EFFECT OF EXTPl’<:T I ON l”’1ETHQDS nl”~ THE=’” PEF::CEf.!Tt:J:iE p-.ND O! LcONSTITUENTS OF LIPPIA C:TRIonQR~1- Maximum of oil percentage was obtained when the fresh leavesand twigs was subjected to steam distillation compared witt, solventextraction metl10d .”2 Citral (a~’b) is the ”lajor constitLlents in oils obtained bysteam distillation followed by D-Limonene and 1,8 Ciniol , while in-Eibs.;olute oil e:.<tr”acted fyom ::or!cr-ete f (:it:YEll (cl+b) i~· thE m.r::,.jor-,:onstituents followed by B-CitFonellol and C21~yophyllene oxi~c .