Pesticide residues in Cereal grains and their productS

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EHperimenh urere condurted in the faculty of Rgriculture, Moshtohor to study the side effect of four chlorinated hydrocarbonmsecnctdes (endrtn, nOT, dieldrin and lindane) at differentconcentrations (5,10, 20 and 40 ppm) on germination and growth of both wheat and corn. R sandy loam soil nearly free from pesticides residues collectedfrom a newly reclaimed area in Salhia was used in tbis studg.The soil treated by different concentrations of the testedpesticides was planted with corn and wheat seeds and was irrigatedwith water to 75’1’0 of its field capacity. Moisture content of .tne treatments were adjusted to be75% of the field capacity by weighing the pots elJery two daysand compensating the water loss.The percentages of germination were recorded after 10 days. TIle rents and green parts of tbe tested plants weremeasured after 30 dnys of cuttiuetlen.ure the roots of the plants mere etso determined after 30 daysof cuttioetion. tnsec:tiride residues leuels through bread professing werealso determined in grains, bran, flour and also on the final bread. The chemical analysis of pesticide residues were conducted following the Universal method. GlC uies used for the determination of these residues in both plants, soil, grains, bran, flourand also in bread. 232 samples from cereal grains dnd their product were collected from 11 qouernoretes (RleHandri6, Behera, Gharbia, DakanHa,Snarkia, Kafre-EI-Sheikh, Kolubi8, Monofia, Cairo, 61z11 and [I-Fayum).These samples were Wheat, wheat flour, wheat bran, maize, maize flour, millet, rice, paddy rice, rice bran, barley andbread. AU tllese samples were analyzed for pesticide r-esidues in190Institut tat, Berlin.The same methods whic-h are used as a routine for nestierne residues analysis in this institute were used for the eHtraction,clean up and determination of pesticide residues. Results indicated that the tested insecticides at all concentrations did not attect the percentage of corn and wheatgermination.nil the tested insecticides decreased root growth of cornplants when cultiuated in soil treated llJith pesticides at ratesmore than 20 ppm.The manlmum decrease in corn root growth (-30.8%) wasrecorded from sou treated with lindane at the rate of 40 ppm.Endrie, nOT and dieldrin at the same rate enhanced slightlythe root growth of com plants. The some concentrations of thesame insecticides tested hardly decreased the wheat rootgrowth ’(-33.3%, -75.2~ and 28.9% respectiuely).Concentration OJ the tasteu mser.ticide s at rates more tnan10 ppm decreased the length of green parts of corn plants.Wheat plants llJere moresenstttue to dieldrin and lindane thanto DDT and endrin. nu concentrations tested decreased thelength of the green nerts.The phytotOltiC effects of the tested insecticides appearedeJearly in the case of wheat and corn plants as it limited wiltand chlorosis in the tip and edges of the reaues~ specially athigh rates trnore than 20 ppm) in most treatments. Undane and endrin enhanced th~-drgweight of corn plantswhen cuttlueted at concentrations more than 20 ppm. The dry weights of the wheat plants urere decreased et allconcentrations tested of dieldrin, while the other tested insecticidesslightly enhanced the dry weight at cuncentretlens more than 5 ppm.Corn and wheat plants absorbed and translocated endnn,dieldrin, DDTand lindane residues from soil contaminated by thetested insecticides at cODcentration of 40 ppm. higher than in green parts. lindane headed aU the tested insecticides in its absorption and translocation in both roots andgreen parts.The concentrations in routs mere higher 0.9 and 2.93 ppm)than in green parts (0.12 and 1.42 ppm) tR the case of wheat and corn respectiuetg. The mean pesticide residues in umeat grain samplesshowed that grains contained 0.086, 0.138, 0.032 and 0.358 ppmof endrin, IDOT,dieldrin, and lindane respectiuely. The

wheat flour produced from these grains contained0.0’03,0.016, 0.020, and .0.030 ppm of endrin, IDDT, dieldrin, andlindane respectiuelg.Bran contained higher concentrations of endrin (0.012 ppm}, lOOT(0.252 ppm), dieldrin (0.120 ppm) and lindane (0.536ppm).Pesticide residues1ellels in fresh bread were O.n02, 0.007,0.0 t 0 and 0.016 ppm of the abolJe insecticides respectiuely.from 2’)2 samples iorm cereal gram ana If.l?lr prouucrs,19~122, 20 and 3 semmes contained residues of lindane, IHCH~~DDTand malathion niqherthen the o(:[eptoble residues limitsin FRG.More than 50% of the tested wheat samples containedmore than the acceptable limits of IH(H~ while from 54 maize, ”samples only 10 samples contained high Ieuels of the samecompound.High Ieuels of IHCH and lindane were detected in 53.9% and15.4% of the samples tested respectiuely unaccentebte reslcue Ieuels of pes tlctdes were detected in100 <:’? 85 7 OJ st S’’Y! 80 O’”.!J 666-”-’1 63· OO~ 60 O¢~ 1:0 007 tC;, • ic, I. {:)” • l-C;. :I Ie:.. •. 101• 1(.” ..J • /’0,50.0’%, 36.3% and 24.6~~ of the samples from Cairo! Behera,Gharbio, Kafre EI-Sheikh, D6~6hlia, Shartia, Giza, EI-Fayoum,AleHandri8~ Monofia and Kalubia resperti1.1ely.