Interrelation ships between some field crops and plant-parasitic nematods infection in relation to plant growth response, yield, chemical composition and nutrient uptake

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Five field experiments were carried out at the Experimental Farm, Faculty of Agriculture, Menoufia University, during the two successive seasons of 1980/81 and 1981/82.The aim of this study is to investigate the susceptibility of 39 different cultivars of 12 field crops toMeloidogyne javanica. Meloidogyne incognita. And Pratylenchus zeae nematodes infection under controlled conditions in pot experiments. The aim of this work also is to study the effect of the additive farmyard manure to soil singly and plus pesticies on mixed nematode community in soil and roots, on plant growth response, yield and chemical component of field crops under naturally infection of nematodes community in the field. 2. Results revealed that faba bean (cv. Giza 1); wheat(cvs. Giza 156, Giza 157 and Chenab 70); and Egyptian lupine were susceptible to M. javanica, when compared with the other tested winter field crops. While faba bean (cv. Giza 1) and wheat (cv. Giza 157) were susceptible to M. incognita. On the other hand, faba bean (cv. introduction 155); flax (cv. Raulinus); andfenugreek were susceptible to P. zeae. 3. No infection took place at all with both rootknot nematode species in the roots of sesame (cv. Giza 23) but it was infected with lesion nematode" P. zeae. On the contrary, soybean (cv. Williams) was not infected withP. zeae, but it was infected with the two species of root-knot nematodes. On the other hand cotton (cvs. Giza 70 and Giza 74) were not infected with M. incognita and P. zeae. Maize plants (Pioneer and Balady) sustained the highest population of P. zeae and the lowest population of the two species of root-knot nematodes. 4. Remarkable inhibition on plant growth response of all the tested winter and summer field crops was recorded in dryweight per plant due to root-knot and lesion nematodesinfection. This inhibition caused in turn a greatdeterioration in the obtained yield. 5. The density of dominant nematode genera in soil of wheat cv. Sakha 8 were Tylenchorhynchus, Meloidogyne, Pratylenchusr Tylenchusr and Helicotylenchus. But the associated nematode genera with the roots were Meloidogyne and Pratylenchus. Nematode genera which were found in soil of wheat cv. Giza 157 plots were: Tylenchorhynchusr Meloidogyner Tylenchusr Helicotylenchus and Trichodorus. But Meloidogyne was the associated nematode genus in the roots only. 6. Soil of faba bean cv. Giza 1 were infested with Meloidogyner Tylenchorhynchusr Pratylenchusr and Helicotylenchus. Roots of faba bean cv. Giza 3 were infested with Meloidogyner Helicotylenchusr Pratylenchusr Rotylenchulusr and Tricodorus, The roots of both cultivars were associated with Meloidogyne.and Pratylenchus7. Nematode genera in soil of clover "Meskawy cultivar" were Meloidogyner cotylenchusrRotylenchulusrTylenchorhynchusrTrichodorus and Tylenchus. But Meloidogyne was associatedwith clover roots.8. The occurrence of nematode genera in soil of cotton cv.Giza 75 were Meloidogyner Tylenchorhynchusr TylenchusrPratylenchusr Criconemoides and Tricodorus. In soil ofcotton cv. Giza 69 nematode genera were, MeloidogynerTylenchusr Helicotylenchusr Longidorusr Criconemoidesrand Pratylenchus. But the associated nematode genera withthe roots of both cotton cultivars were Meloidogyne andPratylenchus.9. In soil of maize cv. Balady nematode genera wereProtylenchusr Tylenchusr Tylenchorhynchus Meloidogyneand Trichodorus. But Pratylenchus

was associated with theroots. Maize cv. Pioneer 514 soil were infested withPratylenchusr Meloidogyner Tylenchusr Helicotylenchusr andTylenchorhynchus. The roots were associated withPratylenchus and Meloidogyne.10. Temik treatment had the best potency in reducing nematode comunity in the soil and as well as nematodes associated with the roots of wheat (cvs. Giza 157 and Sakha 8); faba bean (cvs. Giza 1 and Giza 3); Egyptian clover (cv. Meskawy); cotton (cv. Giza 75 and Giza 69); and maize (cvs. Balady and On the contrary farmyard manure application gave a remarkable increase of nematode community in the soil of wheat (cv.Giza 157)faba bean (cvs. Giza 1 and Giza 3); and nematodecommunity associated with the roots of faba bean (cv. Giza 1).12. Application of herbicides under the field conditions viz.,Brominal on wheat; Cobex on faba bean, Egyptian clover, andcotton; and Atrazine on maize gave a satisfactory controlmeasure against nematode community in fields of the testedcrops. 13. The application of the nematicide, Temik plus one of theherbicides (Cobex or Brominal, or Atrazine) or farmyardmanure gave a good result in controlling the mixed nematodecommunity in soil and the nematodes associated with rootsof winter and summer field crops.14. Studies on the effect of agricultural .treatments on plant growth, yield and chemical components revealed that almost the growth characters and yieldcomponent of the tested crops were significantlyaffected by pesticide and manuring treatments in bothseasons.15. With regard to wheat, Temik and Farmyard manure gavethe highest increase in plant height, number of tillers/m and dry weight/plant. Farmyard manure produced thebest result in this respect in comparison with the othertreatments with regard to spike length, spike weight,grain weight per spike, straw yield, and grain yield.16. Sakha 8 cultivar was significantly superior to Giza 157with regard to yield and its components.17. Farmyard manure gave the highest N, P, and K contenteither as percentage or absolute amount in wheat plants.18. As for faba bean, Temik produced the highest values ofplant height, number of branches/plant, and dry weight/plant followed by farmyard manure treatment.19. Farmyard manure and Temik gave the highest seed yield/fad. of faba bean in the first and second seasons,respectively.20. Faba bean cultivar Giza I was superior to Giza 3 in 100-seed weight and seed yield/fad. in the first season.21. Cobex plus farmyard manure gave the highest percentageor absolute amount of N in faba bean plants. Farmyardmanure Temik, and Cobex singly and in combinationsinduced an increase in N, P, and K uptake by faba beanplants. 22. With regard to Egyptian clover, the application of Temik produced the highest values of plant height in the threecuts.23. Farmyard manure gave the highest value of number ofbranches and dry weight/plant in clover plants at eachcut.24. Generally, farmyard manure produced the highest forageyield of Meskawy clover, followed by Temik, and Temik +farmyard manure in the three cuts.25. Farmyard manure gave the highest percentages as well as the absolute amounts per plant N, P, and K in clover 26. As for cotton, results showed that farmyard manure gave the highest plant height and number of fruiting branches.While Temik plus farmyard manure gave the highest value of dry weight/plant at the different sampling dates. 27. Farmyard manure gave the highest value of boll number and number of open bolls per plant. Temik plus farmyardmanure, and Temik + Cobex farmyard manure gave thehighest percentage of open bolls/plant in the first andsecond seasons. 28. The highest values of seed cotton yield/fad. andweight of seed cotton/boll were produced by farmyardmanure and Temik + farmyard manure treatments.29. Cotton cultivar Giza 75 significantly surpassed Giza 69var. in dry weight/plant, number of bolls/plant, percentage of open bolls/plant and seed cotton yield/fad. 30. Farmyard manure gave the highest percentage or absoluteamounts/plant of N, P and K in cotton plants. Giza 69cultivar had higher N, P and K contents compared withGiza 75. 31. With maize, Temik gave the highest values of plantheight and dry weight per plant, Temik + Atrazine +farmyard manure gave the highest value of fourth leaf area.32. Yield and its components of maize were significantly increased by pesticide and manuring treatments. Temik + farmyard manure produced the highest value of 100-kernel weight and yield of grain/fad.33. Pioneer 514 cultivar was superior to Balady cultivarwith regard to plant height t fourth leaf area, dryweight per plant and grain yield/fad. 34. Farmyard manure gave the highest percentage orabsolute amounts/plant of N, P and K in maize plants, 35. Pioneer 514 showed higher contents of N, P and K thanBalady cultivar.