Studies on pod rots of peanut

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Pod rot disease of peanut is a serious disease worldwide. it occurs onfruits that develop below ground. Diseased plants do not have readilyvisible aboveground symptoms. often the disease problem remainsunnoticed until the peanut is dug. In ARE Peanut areas are widelyincreased with the increase of land reclamation.Surveying studies were carried out on five peanut cultivars namelyGiza 4, Giza 5, local 383, Red race and While race, during season 1994, intwo governorates; Giza and Ismailia for percentage of natural occurrence ofpod rot diseaes and percentage occurrence of fungi associated with• shellsand seeds of different pod rot categories besides the apparently healthy one.Eighteen cvs ,hybrids or lines were evaluated for their reaction to thedisease under field conditions during two successive seasons. Effect ofsome field treatments i.e., fertilization, fungicidal combinations and threegrowth substances on percentage of pod rot incidence and seed germinationof Giza 4 peanut cultivar under field conditions. Isolation frequencies ofvarious fungi on both shells and seeds were recorded with the differentcategories. Seeds moisture and oil content, acid value, aflatoxins and othermycotoxins were detected. Results obtained could be summarized asfollows:I-Pod rot disease was recorded on the five surveyed cvs, in bothGiza and Ismailia governorates.2- The cultivar, Red race was lower than the other cvs. in appearanceof disease categories on pods, in the two governorates surveyed.3- Pods having general breakdown, was the most commonly spreadtype of pod rot on cvs Giza 4 and Giza 5 with significant difference to theother cvs in Giza and Ismailia.1224- The category of pods having dry brown lesions appeared on allcultivated cvs.5- The lowest percentage of the disease was recorded on Red raceand the highest one was on Giza 5. Results also, indicated that thepercentage of pink discoloration was low on all cultivated cvs in bothgovernorates.6-The percentage of pink discoloration was low on all cultivated cvsin both govcrnoratcs.7-Genera of Alternaria, Aspergillus, Cladosporium, Fusarium,Penicillium, Pythium, Rhizopus, Sclerotium, and Trichoderma, besidesRhioctonia solani, the most common fungi associated with pod rot ofpeanut, were isolated from peanut pods and kernels, of peanut plantscultivated in the two governorates surveyed.8-The characteristic fungi of the three disease categories wererecorded on the related category. R. solani caused brown rot, F.nunuliformc caused pink discoloration and various other pathogens causedbreak-down, in the two governorates.9-hlsariul/I spp. were forms characteristic of discolored shellswhereas S. rolfsii was constantly isolated from brown rot and generalbreakdown, (’lado.j)oriul/I spp. was constantly isolated from pinkdiscoloration, and Alternaria spp. was constantly isolated from generalbreakdown, in the two governorates.10- Genera of Aspergillus, Cladosporium, Penicillium, Pythium,Rhizopus, Sclerotium, and Trichoderma, besides F. moniliforme, F.oxysporum, F. solani; were isolated from both apparently healthy anddiseased categories, in the two governorates, Giza and Ismailia.123II-Alternaria spp., Fusarium semitectum and Rhizoctonia solani;were isolated only from diseased categories in the two governorates.12- A. niger, F oxysporum, F. solani, Penicillium spp., S. bataticolaand S. rolfsii, were recorded on shell samples of the four categories, in thetwo governorates.13- A. flavus. was dominant in all seed samples, especially theapparently healthy one, and was isolated from both shells and seedssamples; of the four categories, in the two governorates.14- Penicillium spp. followed by A. niger, and Penicillium spp.followed by A. flavus, were the most frequent species isolated from shellsand seeds respectively in the two governorates.15- S. bataticola, S. rolfsii, Penicillium spp. and Trichoderma spp.were isolated from seeds of healthy pods (intact pods), and were dominantin endocarpic community of sound mature

peanut fruits.16- S. rolfsii exhibited the highest percentage of pod rot infectionfollowed by F. oxysporum, on Giza 4 peanut cv in pathogenicity testwhereas, F OXYS[JO/'l"" followed by R. solani were more aggressive onGiza 5 peanut cv. but F moniliforme was the lowest one, in this respect.17- Varietal reaction revealed that pod rot diseases were spread onall cultivars and the eighteen tested cultivars differed greatly ill theirreaction to the diseases, in both quality and quantity of pod rot incidence.18- Under field conditions, addition of K alone, tended to increasepercentage of pods having dry brown lesions, and slightly affectedincidence of pink discolorations. At contrast, using P gradually reducedpods with dry brown lesions and pink discoloration. Combinations of both;clearly reduced the two categories.19- The use of N only at the normal level; increased percentage ofpods having general breakdown.12420- The highest percentage or apparently healthy pods, was recordedwith I'K combination or 45-48.21- Combination of PK at levels 30-48 and 45-48 was the besttreatment on seed germination percentage of different pods categories,except for pods having general breakdown.22- PK fertilization increased Pacelomyces spp. and Penicillium spp.111 both shells and seeds of all categories, whereas F. semitectum hadincreased only in seeds of pods having dry brown lesions and Pythium spp.in shells of pods having general breakdown. Besides, A. ochraceus, A.terreus and Trichoderma spp. in both seeds and shells of pods having drybrown lesions, A. flavus in seeds and Rhizopus spp., S. rolfsii andTrichoderma spp. in shells of the same category.23- Combinations of P and K; decreased A.flavus, A. niger in seedsof apparently healthy pods and shells of pods having dry brown lesions, A.flavus in seeds and shells of pods having pink discoloration, A. niger inseeds of pods having dry brown lesions and pods having generalbreakdown.24- Addition of K increased R. solani in only seeds of pods havingdry brown lesions.25- In shells of pods having general breakdown; PK nutnnonincreased A. nigel', whereas A. tennis, A. flavus, Rhizopus spp., ,<{ rolfsiiwere increased in both seeds and shells of this category.26- In shells of apparently healthy pods; combinations of PKincreased A .flavus, A. niger, S. batatico!a and S. rolfsii.27- Increasing P level increased average incidence of S. rolf vii inshells and seeds of the four categories except for seeds of dry brown lesionsand of apparently healthy pods.12528- Increasing K levels increased Pythium spp. but decreased S.hataticola.29- Moisture content of peanut seeds fluctuated within a wide rangeas a result of fertilization with the normal level ofN and different levels ofP and K.30- Oil content was greatly high in pods having dry brown lesions atPK level 30-48 and the normal level of N, while the lowest one wasrecorded on pods having general breakdown at PK level 30-0 andfertilization with N at the normal level.32-AII tested seed dressing fungicides effectively reduced the incidenceof pod rot and consequently increasing percentage of apparently healthypods.33-lllatoxin H. was detected in seeds of pods having pinkdiscoloration and pods with general breakdown which collected frompeanut plants treated with Nat normal level and PK at level 30-24.34-Clear reduction was noticed on the acid value of seeds ofapparently healthy pods followed by pods with dry brown lesions as aresult of fertilization with the normal level ofN and different levels of Pand K.35- Soil treatment with fungicides had also a good effect in reducingthe disease with highly significant differences compared with control.36- Sumisclex was found to be the most effective one, as both seeddressing and soil treatment, in reducing the disease and recording thehighest percentage of healthy pods.37- Fungicidal application improved germination and generallyincreased percentage of seed germination38- All fungicides applied; greatly reduced the percentage o,f fungiisolated li'OI11 both shells and seeds of the lour categories, compared withcontrol, with few exceptions,39- All fungicidal treatments clearly increased seed moisture contentthan control treatment.40- Fungicides treatments moderately affected oil content ofapparently healthy pods but greatly affected oil content in seeds of podshaving general breakdown and pods having dry brown lesions.41- Fungicidal treatments increased the acid value of peanut oil,compared with control. The lowest acid values were recorded on apparentlyhealthy pods, in most cases with Benlate followed by Sumisclex as seeddressing.42- All fungicidal treatments inhibited aflatoxins production, withfew exceptions on pods having dry brown lesions and pods having generalbreakdown43- 111 growth substances tested, great ly reduced pod rot of peanut.IBI followed by ITP, at 100 PPM were the best treatments iii increasingpercent of apparently healthy pods.44- In all growth substances treatments, apparently healthy pod wasincreased, parallel and proportional with increasing concentration.45- ATP at 50 PPM was the best treatment in reducing pods havingdry

brown lesions while, 100 PPM had better effect on pods having pinkdiscoloration.46- IBA followed by ATP, at 100 PPM; were the best treatments inreducing pods having general breakdown.47- All growth substances treatments clearly increased percentage ofseed germination compared with control. ATP and IAA were better thanlBA. The highest percentage of seed germination on the four categorieswas recorded with the concentration of 100 PPM.48- Growth substances greatly affected occurrence percentage ofvarious fungi associated with both shells and seeds of the differentcategories compared with control. .In all treatments, fungi decreased withincrcasing couccntrat ion.49- Growth substances at concentration of 100 PPM exactly,controlled all fungi associated with both shells and seeds of all categorieswith few exceptions.50- Growth substances at concentration of 25 PPM slightly affectedpercentage occurrence of various fungi on shells and seeds of the fourcategories.51- Growth substances at different concentrations, had no consistenttrend on peanut seed moisture content of the different categories. Thehighest percentage of moisture content was recorded on seeds of podshaving dry brown lesions whereas the least one was obtained on seeds ofpods having pink discoloration.52- Generally ATP, lAA and lBA at concentration of 25 PPM,reduced oil content, of all categories, with few exceptions. ATP atconcentration of 100 PPM raised oil content, of all categories except forseeds from pods having general breakdown.53- Growth substances at all treatments clearly increased the oil acidvalue of seeds from both pods having dry brown lesions and healthy podscompared with control.54- Aflatoxin Bl was detected on seeds of pods having dry brownlesions which collected from peanut plants treated with IAA at 50 PPM.Aflatoxin B1 was detected on seeds of pods having general breakdownpreviously treated with ATP at 100 ppm and lAA at 50 ppm. The allatoxintype Gl was detected only in seeds of pods having general breakdownpreviously treated with IAA at 50 ppm.55- Ochratoxin A was detected III seeds of pods having generalbreakdown previously treated with ATP at 25 PPM. Ochratoxin A was alsodetected in seeds of pods having general breakdown where seeds weretreated with Topsin-M and cultivated in soil treated with Sumisclex. Maybe this is the firs! report on the natural occurtancc of ochratoxin A onpeanut.