

SHORT COMMUNICATION**Chemical control of leaf blight and inflorescence rot diseases on date palm in large- scale field trials in Basrah/ Iraq.**¹Mohammed H Abass²Mohammed M. Maziel¹Plant Protection Department, College of Agriculture , Basra University.²Plant Protection Department, Basrah Agricultural Directorate, Ministry of Agriculture. Basrah 61001, Iraq.dr.mha24@yahoo.co.uk**Abstract**

Iraq is one of the highest dates producers of the world; the total production of dates was estimated 37.556 tons in Basra province at the season of 2016-2017; however, a significant reduction of dates due to heavily disease incidence of fungal pathogens is expected. Protection of date palm from fungal pathogens including *Serenomyces phoenicis* and *Mauginiella scattae* is a crucial factor in reducing losses. During the season of 2016-2017, an extensive program of chemical control was applied in date palm orchards to protect date palm trees from the diseases by using fungicides Swift[®], Othello Top[™], and Brik[®].

Results showed the efficiency of Swift[®] in disease control of leaf blight pathogen (*S. phoenicis*); the disease incidence was reduced from 23.4 and 6.3% at the North and South of Basra to 6.8 and 1.9%, respectively after 14 days of fungicide treatment; respectively. The disease severity was 18 and 12.7% at the North and South of Basra; respectively and reduced significantly up to 4.7 and 4.3% in Swift[®] treatment and followed by Othello Top[™] and Brik[®] fungicides.

A similar trend of results was observed with inflorescence rot disease; the fungicide Swift[®] showed the best activity to a decrease in both disease incidence and severity at the North and South of Basra date palm orchards.

Keywords: Chemical control; date palm; fungi; Iraq; *Phoenix dactylifera*

Introduction

Date palm (*Phoenix dactylifera* L.) is one of the most important cultivated species of the Arecaceae family, grown mainly for its fruit; date fruit is highly nutritious and very rich in sugar, minerals, and vitamins (Abass, 2016a). Date palm is a susceptible host for different pathogens such as bacteria; fungi and nematodes; The fungal diseases of date palm in particular cause serious problems, including reduced growth and development of the trees; as well as production (Abass and Muhammed, 2014). These diseases include inflorescence rot caused by *Mauginiella scattae* Cav. (Abass, 2005); leaf blight disease caused by *Serenomyces phoenicis* (Rolland) E. Müll. & S. Ahmad (Al-Asadi, 2007); leaf spot pathogens *Nigrospora* spp. (Abass, 2017) Moreover, fruit rot disease caused by different pathogens such as *Aspergillus*, *Alternaria*, *Fusarium*, and *Penicillium* (Abass, 2016b). The use of chemical fungicides is an option for restricting the growth of pathogens; several fungicides having been reported as a potential mean for controlling plant fungal diseases (Saeed et al., 2016, Fayadh et al., 2016). Current work aimed to verify the efficiency of several fungicides in controlling the pathogens of leaf blight and inflorescence rot diseases on date palm in a field trial.

Materials and Methods

The region and experimental design

Large- scale field trials were conducted at different locations in Basra province (North and South regions) during the season of 2016-2017. All trials were conducted in private orchards; the disease incidence and severity for *S. phoenicis* and *M. scattae* (which previously isolated and identified at Date Palm Research Centre laboratories) on date palm was recorded. Each trial consisted of 4 different orchards in eight regions of North of Basra representing Az-Aldeen; Aldeer; Alhartha; Alqaem; Alsadeq; Alnashaw; Alqurna and Almedina; while the South of Basra representing Abu-Alkhaseeb and Alfao. Treatments with selected fungicides and untreated controls were done in a randomized design.

Chemical treatments

Three fungicides have been selected (as shown in Table 1); all chemicals were applied to date palm trees according to recommended doses using compressed air.

Disease scoring

A natural development of each fungal pathogens was allowed at each site of study; disease incidence and severity were calculated according to McKinney index formula (1923) before and 14 days after chemical applications.

Table (1) Fungicides evaluated in large scale application on date palm.

Product	Active Ingredient (g/ litre)	Rate Applied (100 litre)	Manufacture company
Swift [®] 50%	Carbendazim 50%	150 ml/ 100 L.	Agrichem
Othello Top [™]	Azoxystrobin 200 Difenoconazole 125	75 ml/ 100 L.	Sineria
Brik [®] 24 EC	Myclobutanil 24%	75 ml/ 100 L.	Sineria

Results and Discussion

Combined data of the North (8 sites) and South (2 sites) regions of Basra province for chemical control in field trials showed significant effects of fungicides applications in decrease the disease incidence and severity of leaf blight and inflorescence rot diseases. Swift[®] treatment resulted in decreased disease incidence of *S. phoenicis* pathogen from 23.4 and 6.3% at the North and South of Basra in untreated controls; to 6.8 and 1.9% after 14 days of fungicide treatment; respectively. Disease severity was reduced significantly as a consequence of Swift[®] treatment from 18 and 12.7% at the North and South of Basra; respectively, to 4.7 and 4.3% for *S. phoenicis* pathogen. Followed by Othello Top[™] and Brik[®] fungicides (Fig. 1A). The effect of chemical control of *M. scattae* pathogen on date palm was evident in all examined regions (North and South of Basra province) as shown in Fig. (1B). The best results observed in Swift[®] treatment on both disease incidence and severity. The disease incidence was 3 and 6.6% at North and South regions; respectively and reduced to 1.3 and 2.6% in Swift[®] treatment. A similar trend of results observed with disease severity, Othello Top[™], and Brik[®] treatments showed a significant reduction in *M. scattae* activity as disease incidence and severity on a date palm. Our results showed the importance of *S. phoenicis* and *M. scattae* as true pathogens on date palm at different sites in Basra province, the highest disease incidence and severity of *S. phoenicis* were seen at North parts of Basra; opposite was seen at the South parts of Basra where the inflorescence rot disease showed the highest level of disease. Many previous studies showed the pathogenicity of both fungal pathogens (*S. phoenicis* and *M. scattae*) on date palm trees in Basra province (Abass, 2005, Al-Saadoon et al., 2005, Al-Asadi, 2007, Fayadh et al., 2016). Among all chemical tested fungicides, results revealed the effectiveness of Swift[®] fungicide in inhibition of leaf blight and inflorescence rot diseases at all examined orchards, these results were following the results of Al-Yaseri et al. (2011) when they used carbendazim as an active ingredient in controlling *M. scattae*. Additionally, several fungicides have been used to control different fungal pathogens on date palm including Benlate; Score; Bayleton; Tilt, Ortiva; Naturame; Phyton-27; Revus Top and DAZIM (Saeed et al., 2016, Fayadh et al., 2016, Irabi et al., 2018). In conclusion, the chemical fungicide Swift[®] (a.i. carbendazim) at the recommended rate was the most effective among examined fungicides in controlling *S. phoenicis* and *M. scattae* pathogens in field trials which reduced the disease incidence and severity at South and North parts of Basra province.

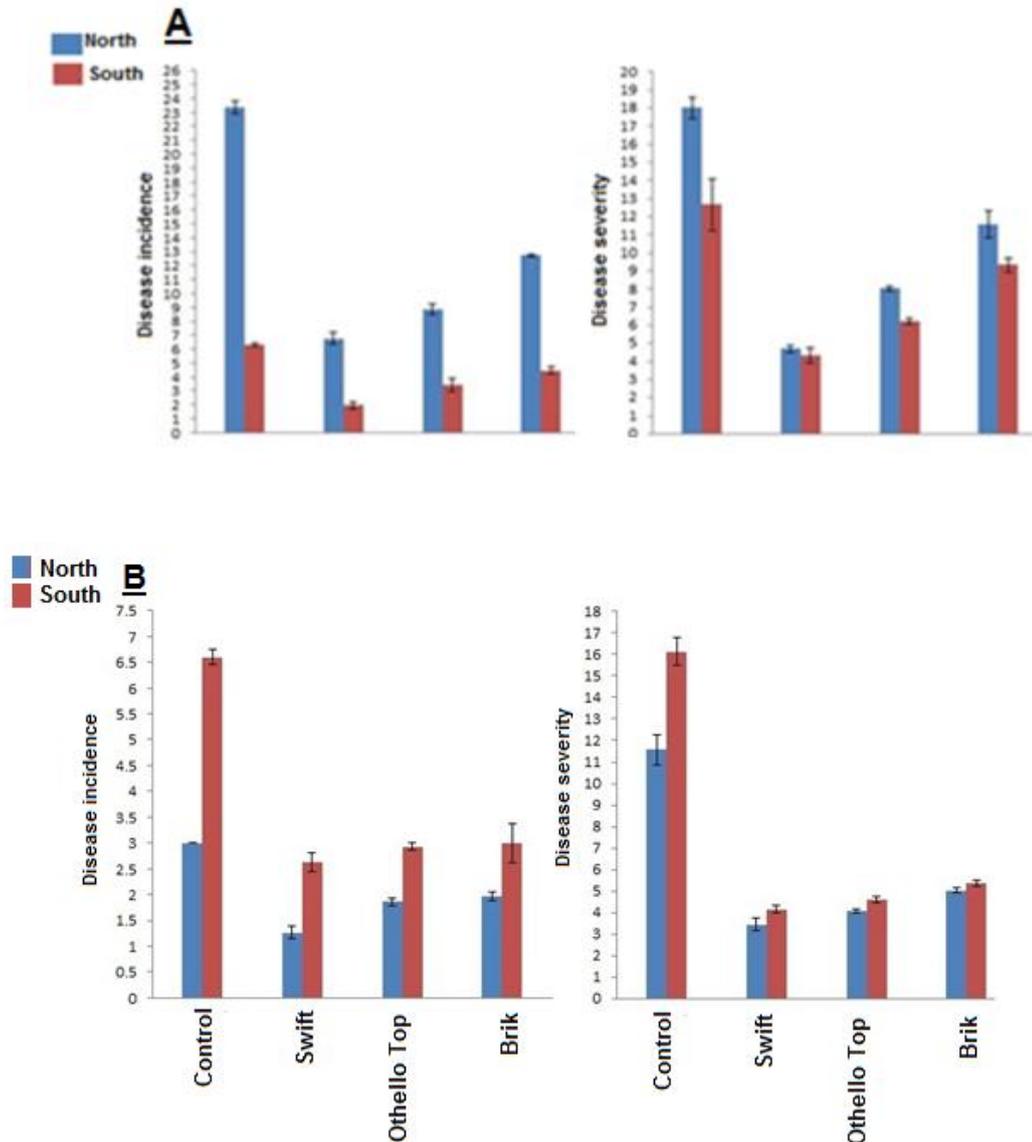


Figure 1. Efficacy of different fungicides on disease incidence and severity of A. S. phoenicis. B. M. scattae. Values represent the average of treatments \pm Standard deviation.

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المكافحة الكيميائية لمرض لفحة الأوراق وتعفن النورات الزهرية في نخيل التمر في

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الخلاصة

يعد العراق من أكبر الدول المنتجة للتمر في العالم، وقدر الإنتاج الكلي للتمور في سنة 2016-2017 ما مقداره 37.556 طناً في محافظة البصرة، وعلى الرغم من ذلك يوجد إنخفاض معنوي في معدل الإنتاجية للنخلة الواحدة بفعل الإصابات المرضية ومنها الممرضات الفطرية. إن حماية نخيل التمر من الإصابات الفطرية ومن بينها الفطر *Serenomyces phoenicis* و *Mauginiella scattae* يعد عاملاً مؤثراً في تقليل الخسائر بفعل الإصابات، ولقد تم تطبيق برنامج مكافحة كيميائية مكثف لحماية النخيل من الفطرين الممرضين بإستخدام المبيدات *Swift*[®] و *Othello Top*[™] و *Brik*[®] رشاً في بساتين مناطق شمال وجنوب محافظة البصرة.

أشارت النتائج إلى كفاءة مبيد الـ *Swift*[®] في مكافحة مرض لفحة جريد النخل المتسبب عن الممرض *S. phoenicis* إذ أدت معاملته إلى تقليل نسبة الإصابة من 23.4 و 6% في شمال وجنوب البصرة، على التوالي إلى 6.8 و 1.9% على التوالي بعد اربع عشرة يوماً من الرش بالمبيد. في حين كانت شدة الإصابة 18 و 12.7% في شمال وجنوب البصرة، لتتخفض بفعل معاملة المبيد *Swift*[®] لتصل إلى 4.7 و 4.3%، على التوالي، لتأتي معالمتي المبيدين *Othello Top*[™] و *Brick*[®] ثانياً من جهة كفاءة الرش.

وجاءت نتائج كفاءة المبيدات قيد الدراسة في حماية النخيل من مرض تعفن النورات الزهرية متشابهة من جهة كفاءة المبيد *Swift*[®] الذي أعطى أعلى حماية لنخيل التمر المعامل من هذا المرض، إذ قللت معاملته كلا من نسبة الإصابة وشدتها في مناطق شمال وجنوب محافظة البصرة.

الكلمات المفتاحية: المكافحة الكيميائية، نخيل التمر، الفطريات، العراق.