CASE STUDY:
CAB Abstracts on CAB Direct
Panama disease of bananas

CAB Abstracts is the most complete applied life sciences literature database in the world. Its coverage includes agriculture, environment, veterinary sciences, applied economics, food science and nutrition.

CABI's online database platform, **CAB Direct**, has been built specifically for researchers working in the applied life sciences to help them use CAB Abstracts to research complex problems quickly and with precision.

KNOWLEDGE FOR LIFE

Panama disease of bananas

In the 1950s, Panama disease virtually destroyed the banana crop worldwide. Plantations were replanted with Cavendish bananas which were resistant to the disease. A new strain of Panama disease, Tropical Race 4 or TR4, has emerged which Cavendish bananas are susceptible to. TR4 is destroying banana plantations in Southeast Asia and has spread to Northern Australia, the Middle East and Africa.

No single method of controlling TR4 has been identified and the global supply of bananas is once again under threat.

CAB Abstracts is the most comprehensive database of applied life sciences literature in the world. CAB Direct is the only online platform built specifically to help researchers maximise the potential of CAB Abstracts.

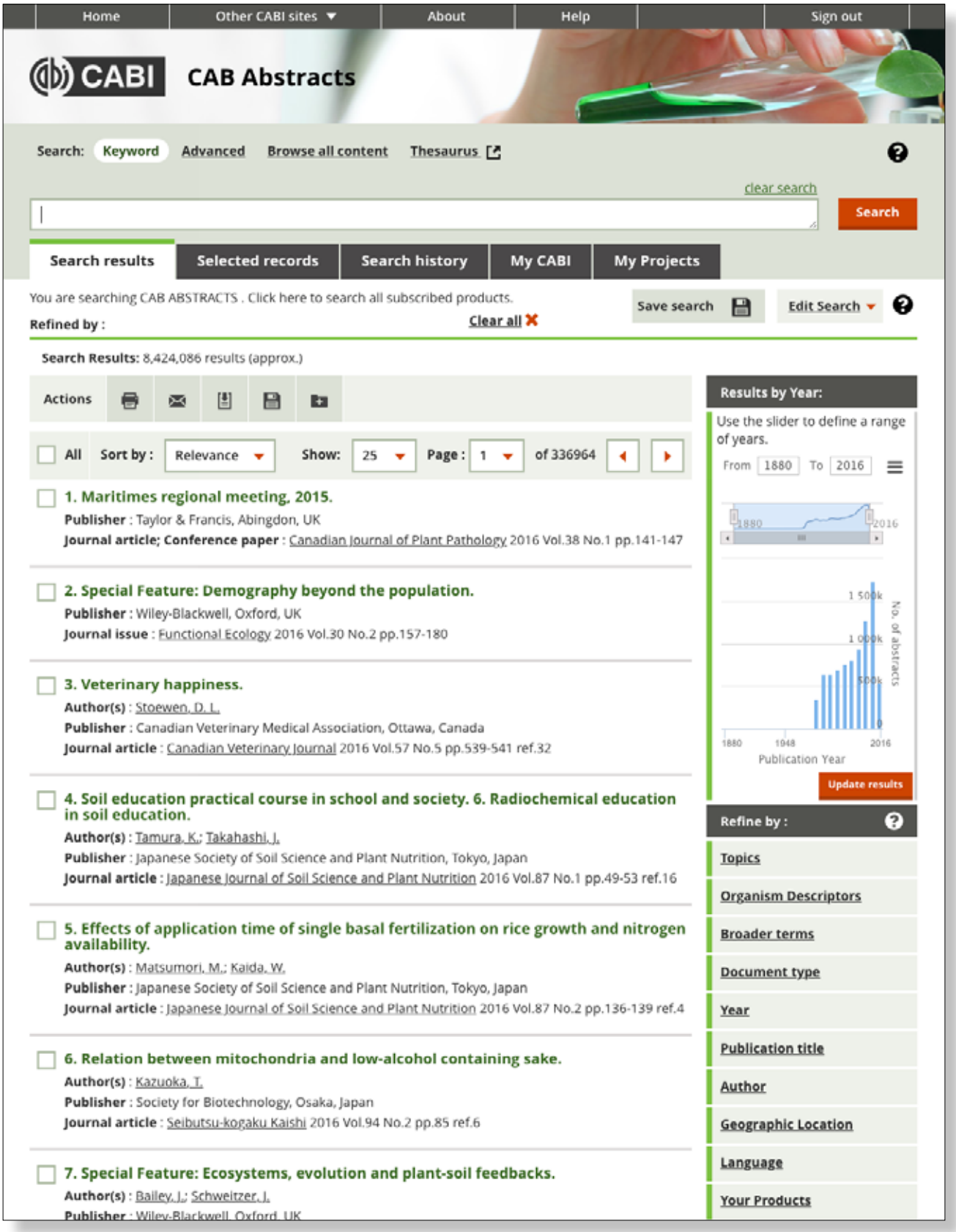
On **CAB Direct**, CAB Abstracts can help researchers understand the scale of the problem and identify potential methods or combinations of methods for managing Panama disease, particularly strain TR4.

The screenshots in this case study show CAB Abstracts in use on the CAB Direct platform.

Panama disease of bananas, leaf symptoms

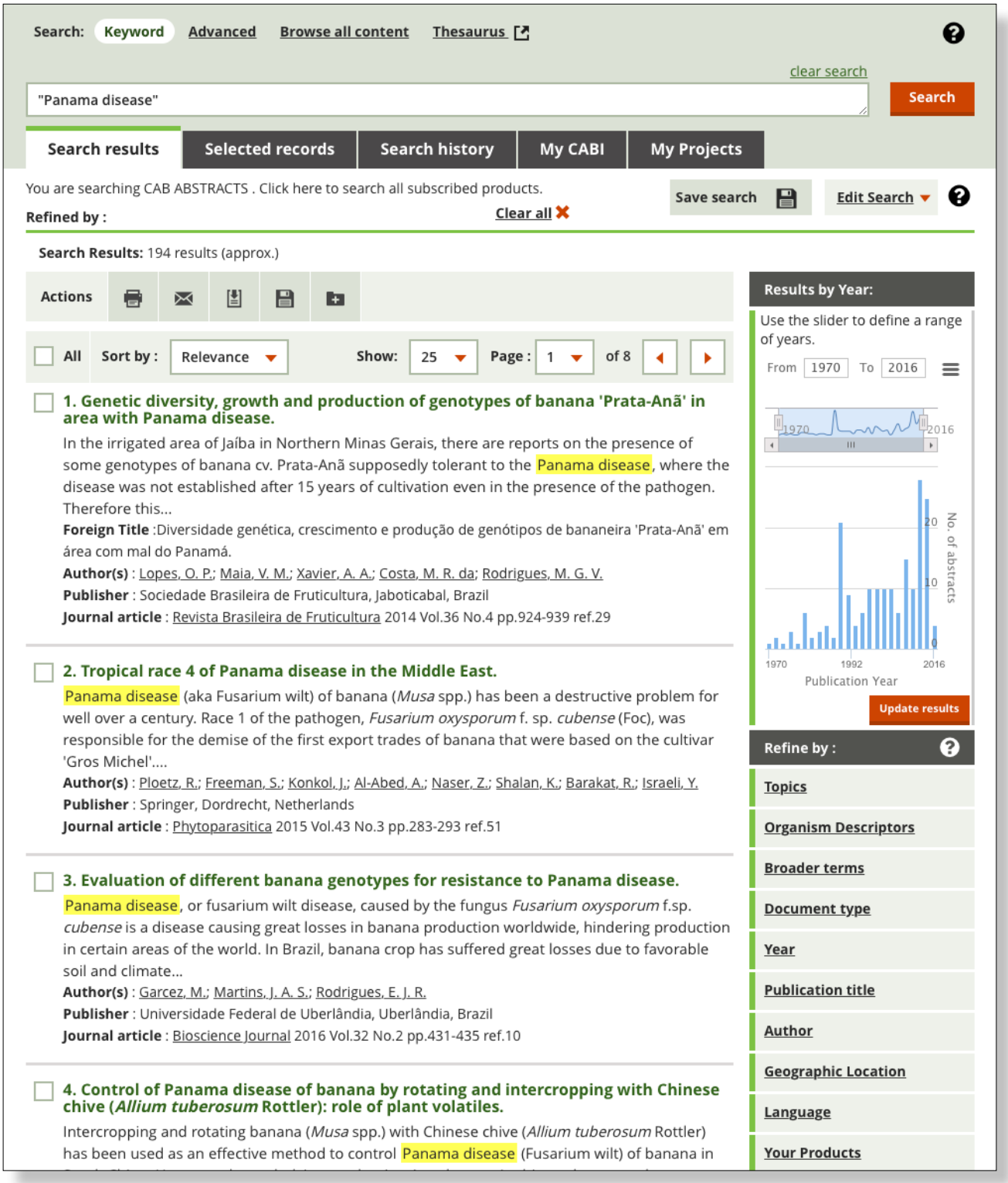
Panama disease of bananas, internal stem close-up

CAB Abstracts contains over 8.4 million records providing access to the world's applied life sciences literature.



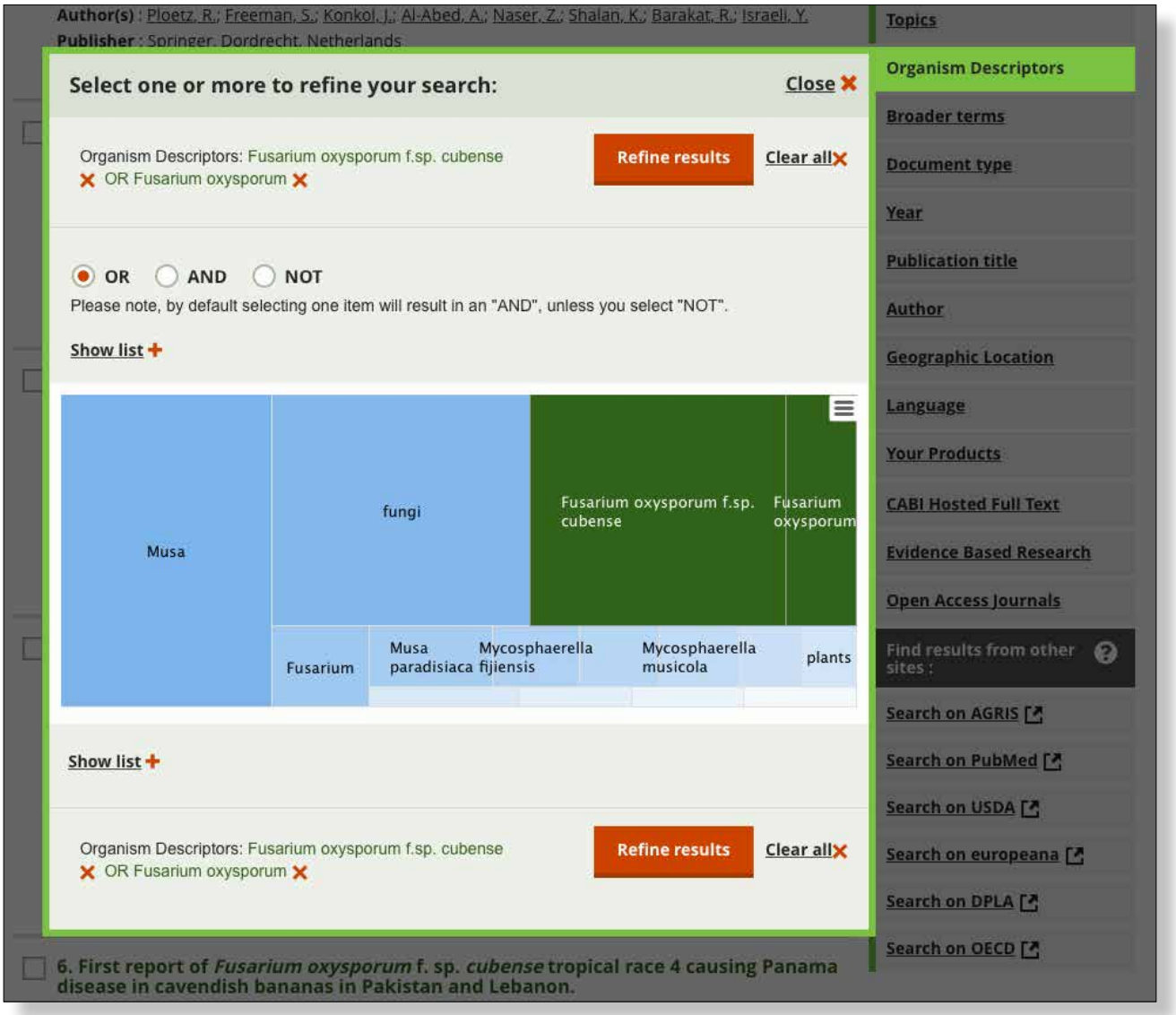
Searching CAB Abstracts for the phrase “Panama disease” gives us some results, and the information you require to develop the search.

On CAB Direct, the results page has been designed to make searching for relevance fast and simple.



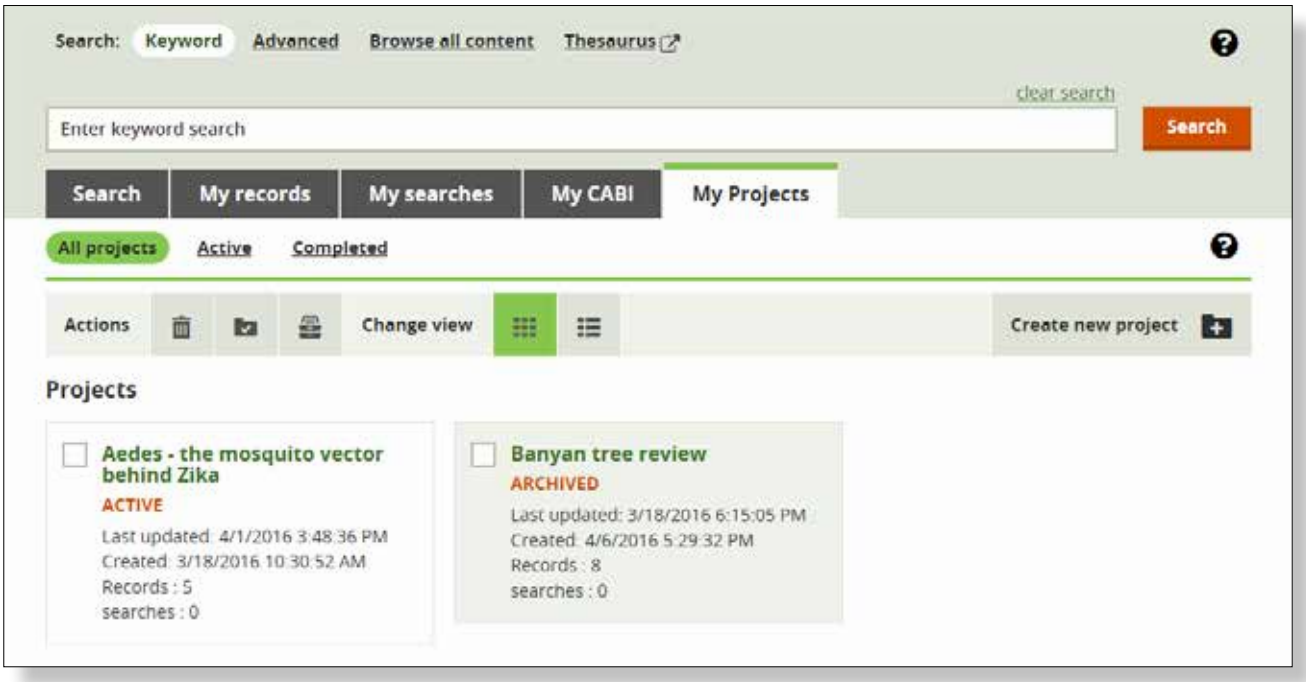
To make searching really powerful, CAB Abstracts is indexed using the CAB Thesaurus, the largest and most comprehensive controlled vocabulary in the applied life sciences.

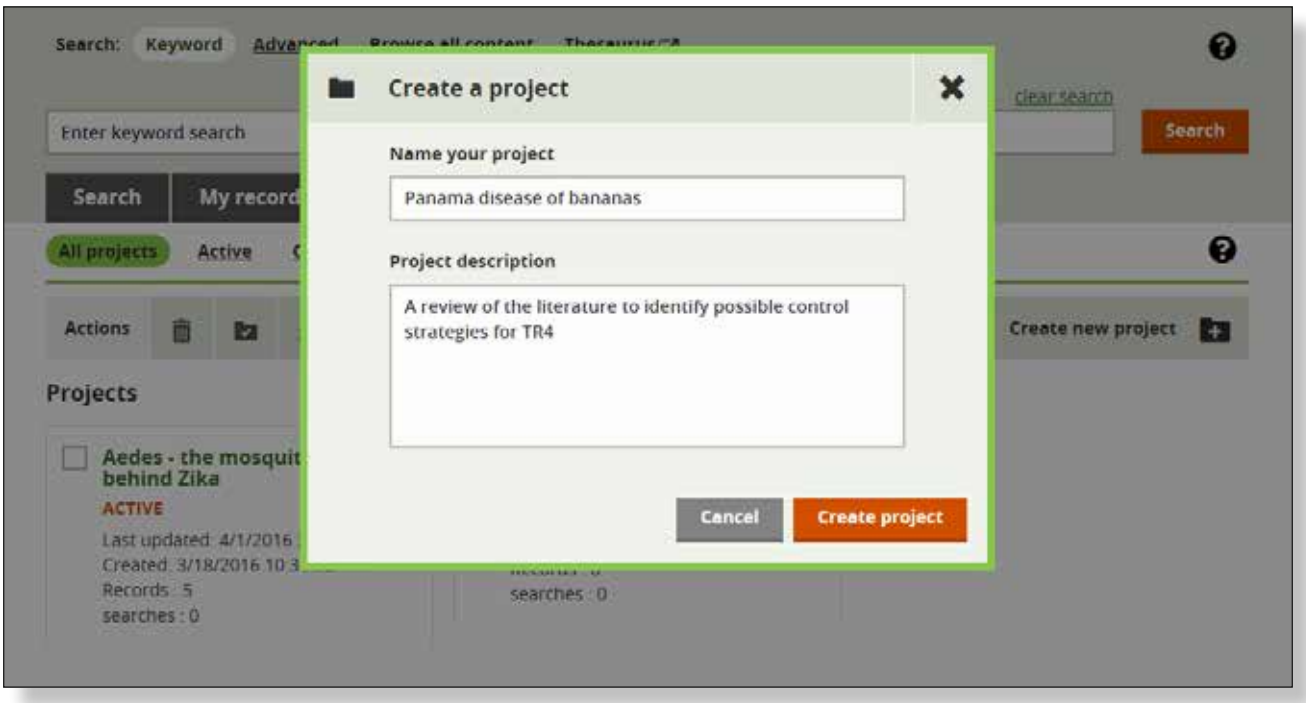
CAB Direct uses a new visual interface so we can quickly see which terms are most commonly used, and easily identify and refine by the correct organism descriptions for Panama disease.



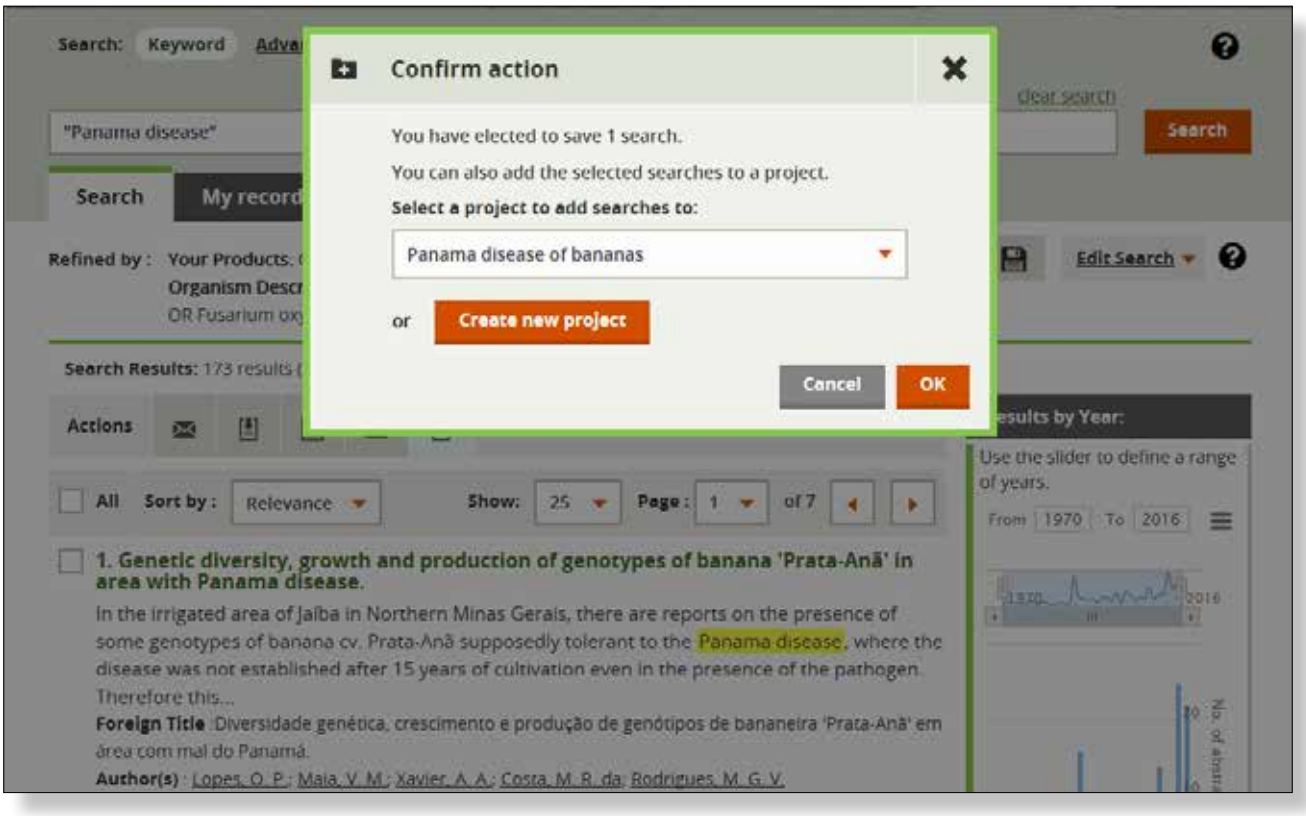
Now that we have a search strategy developing and a set of results to work with, we can use the 'My Projects' feature on CAB Direct to save and organise our searches and results.

It's quick and simple to sign-up for a 'My CABI' account and with this we can save searches and records, create and work on projects, highlight records and add annotations as well.



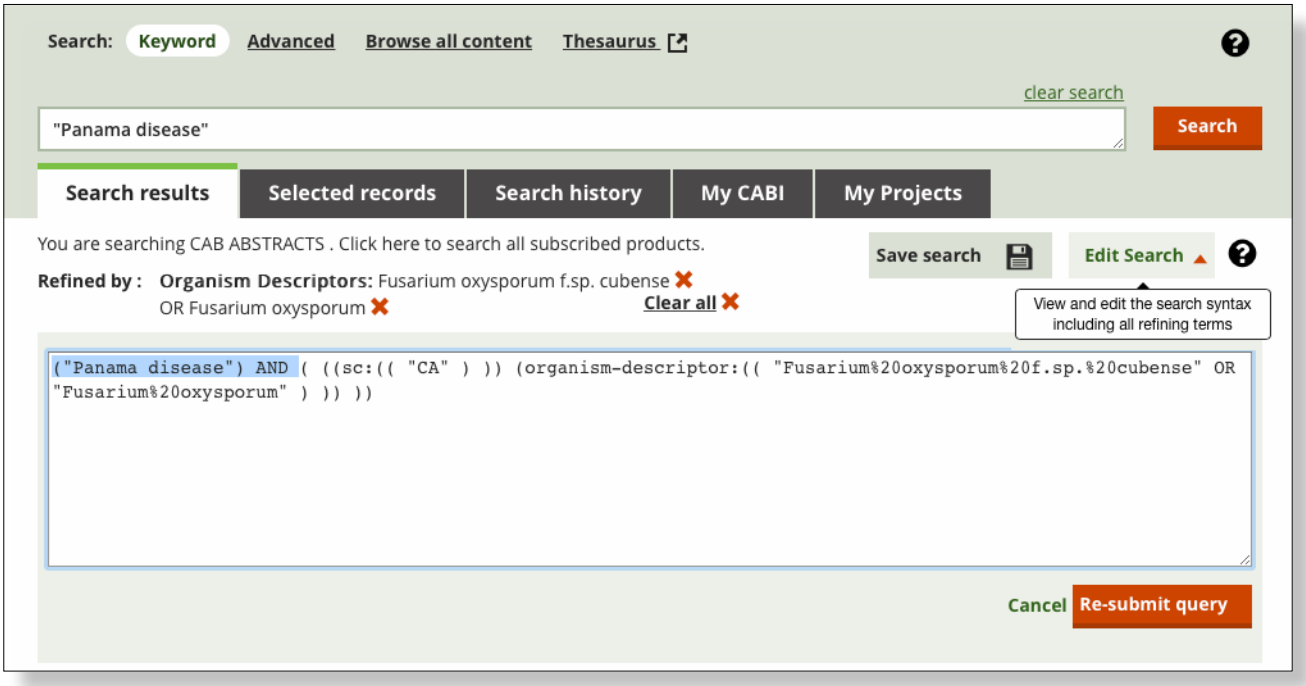


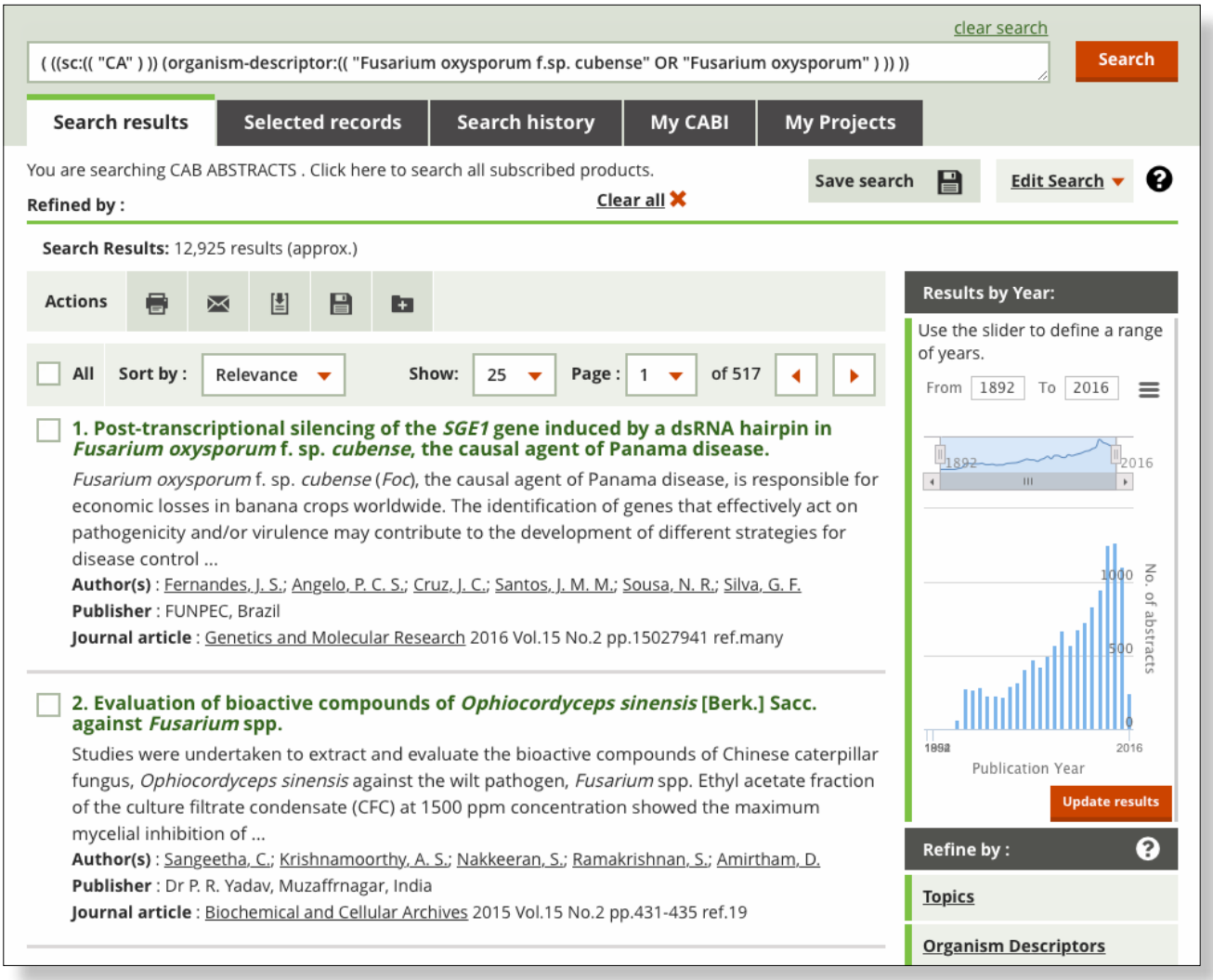
We can now go back to the search results, develop the search strategy and save searches to the project.



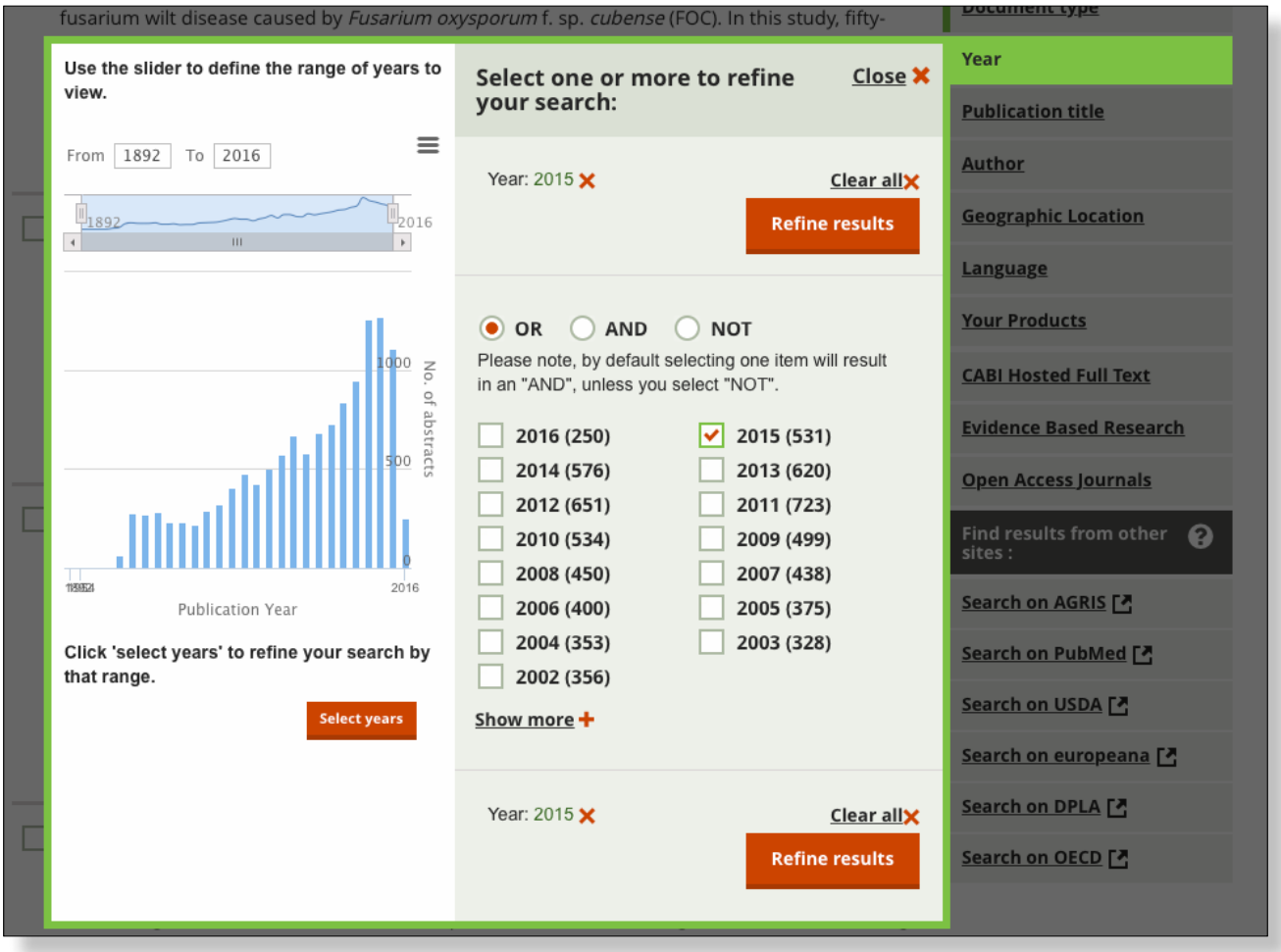
The Edit Search function is an easy way to remove the informal search phrase "Panama disease", so that we use only the correct organism names.

This gives us many more results to work with.

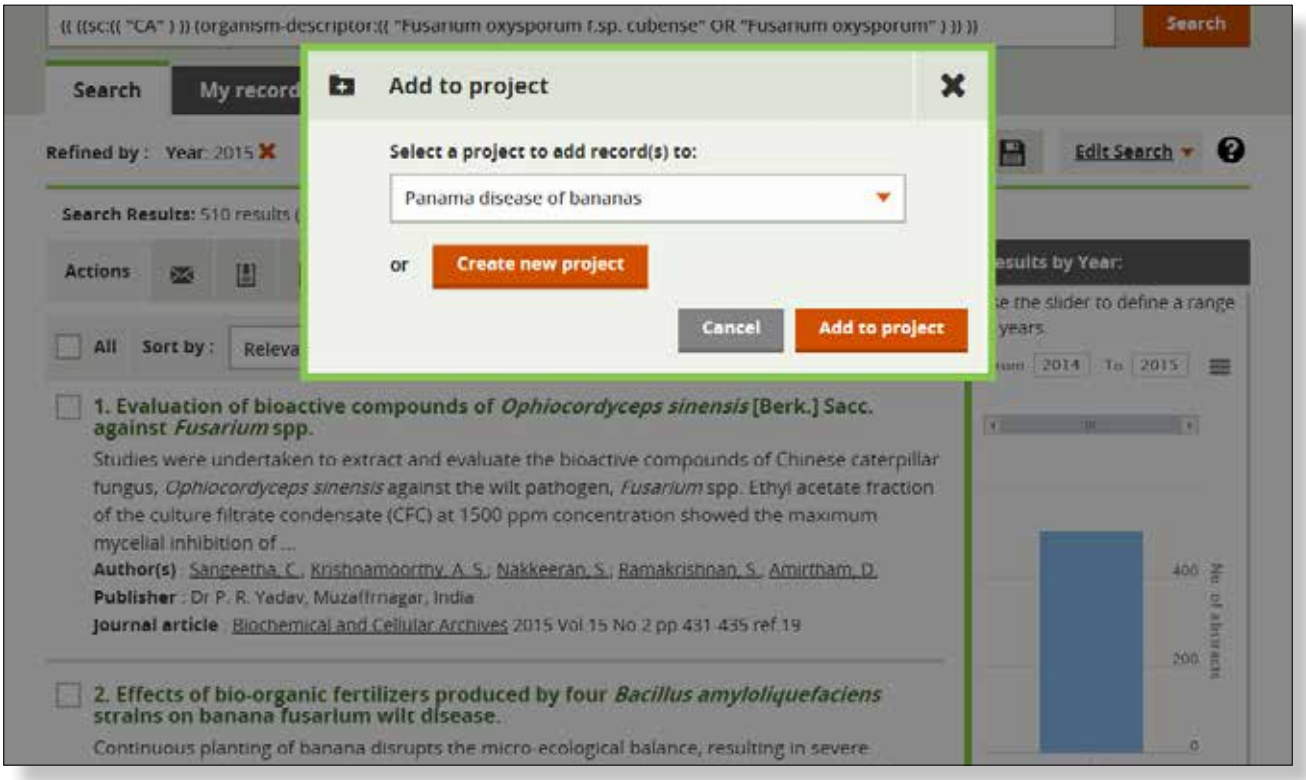




We can use the interactive date chart to restrict the results to recently published articles, in this case articles published in 2015.

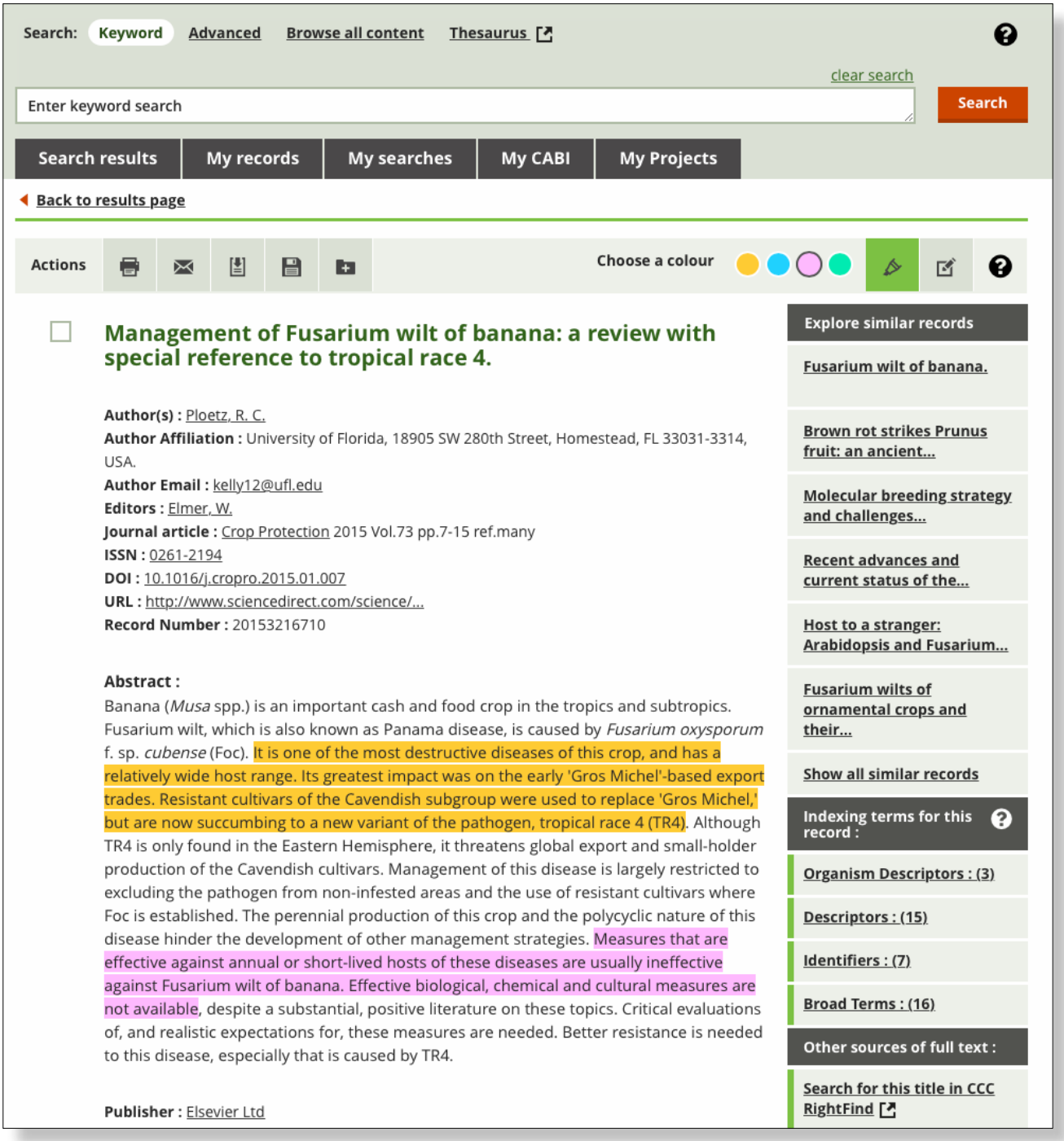


And we can select interesting records and save them to the project too.

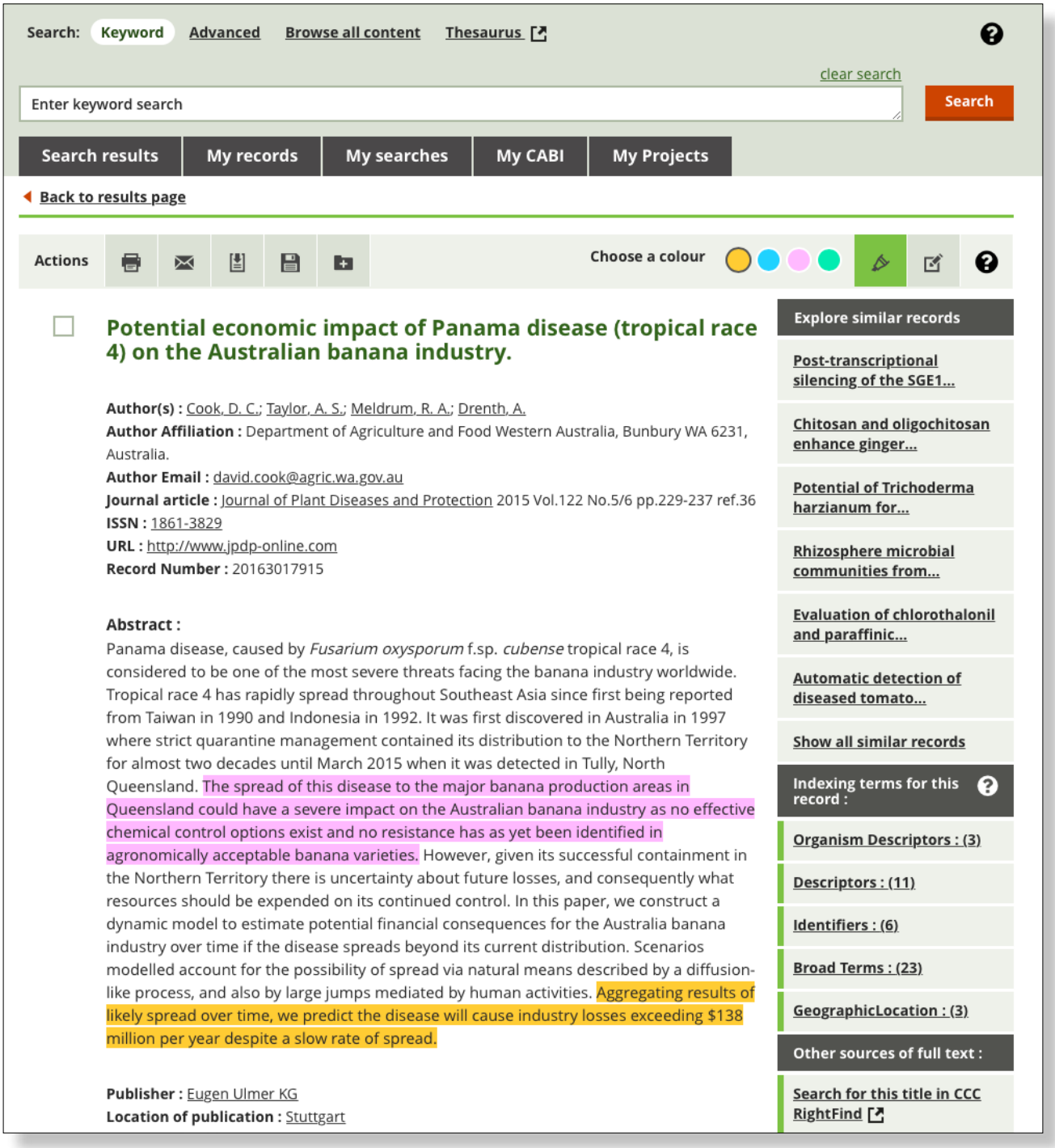


In CAB Abstracts on CAB Direct, we can highlight significant passages of text.

Here we see that CAB Abstracts covers research that examines the scale of the problem, its potential economic impact and methods for detecting it.

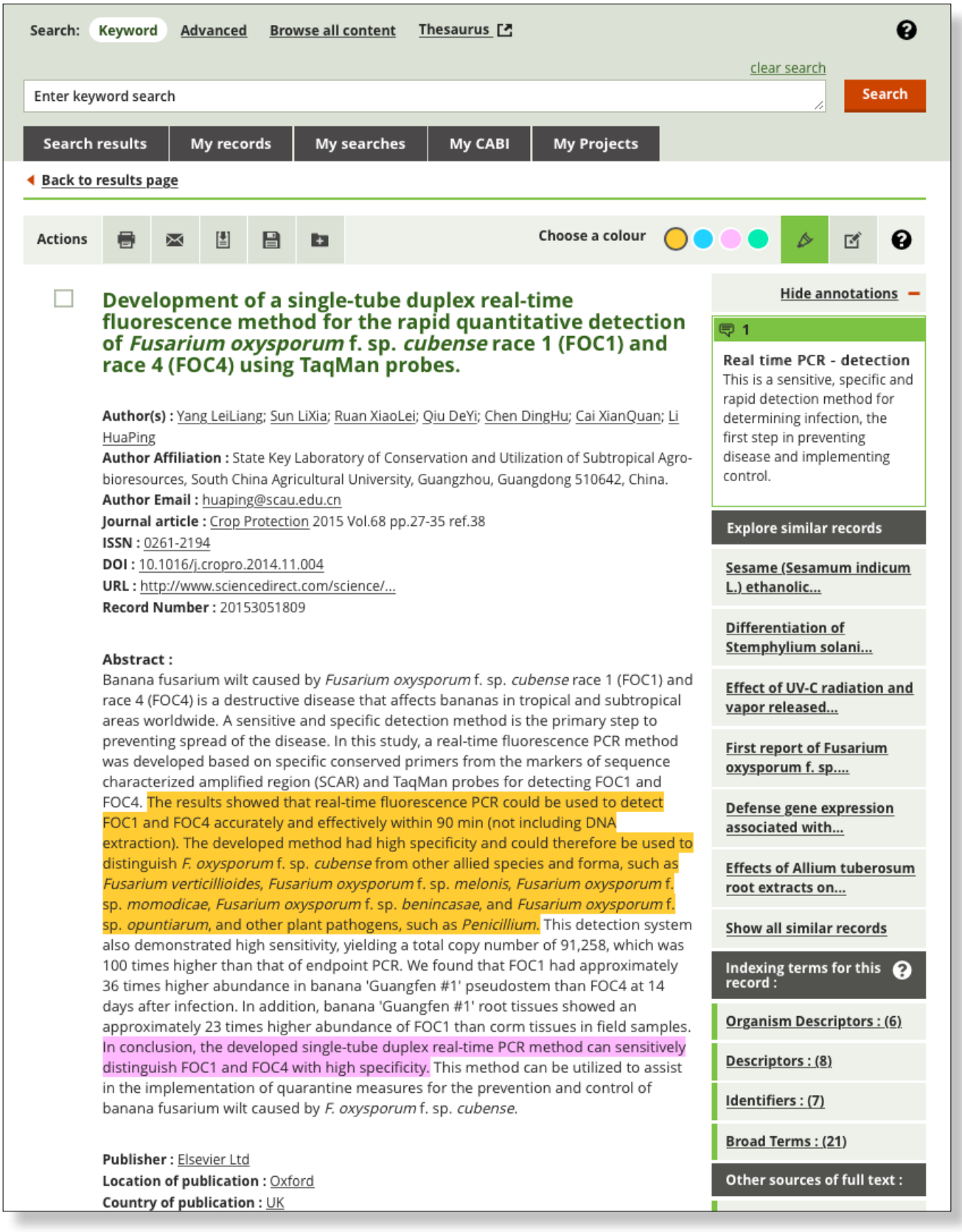


In CAB Direct we can organise our data by using different colours to highlight different parts of the abstract, for example the research objective and the results.



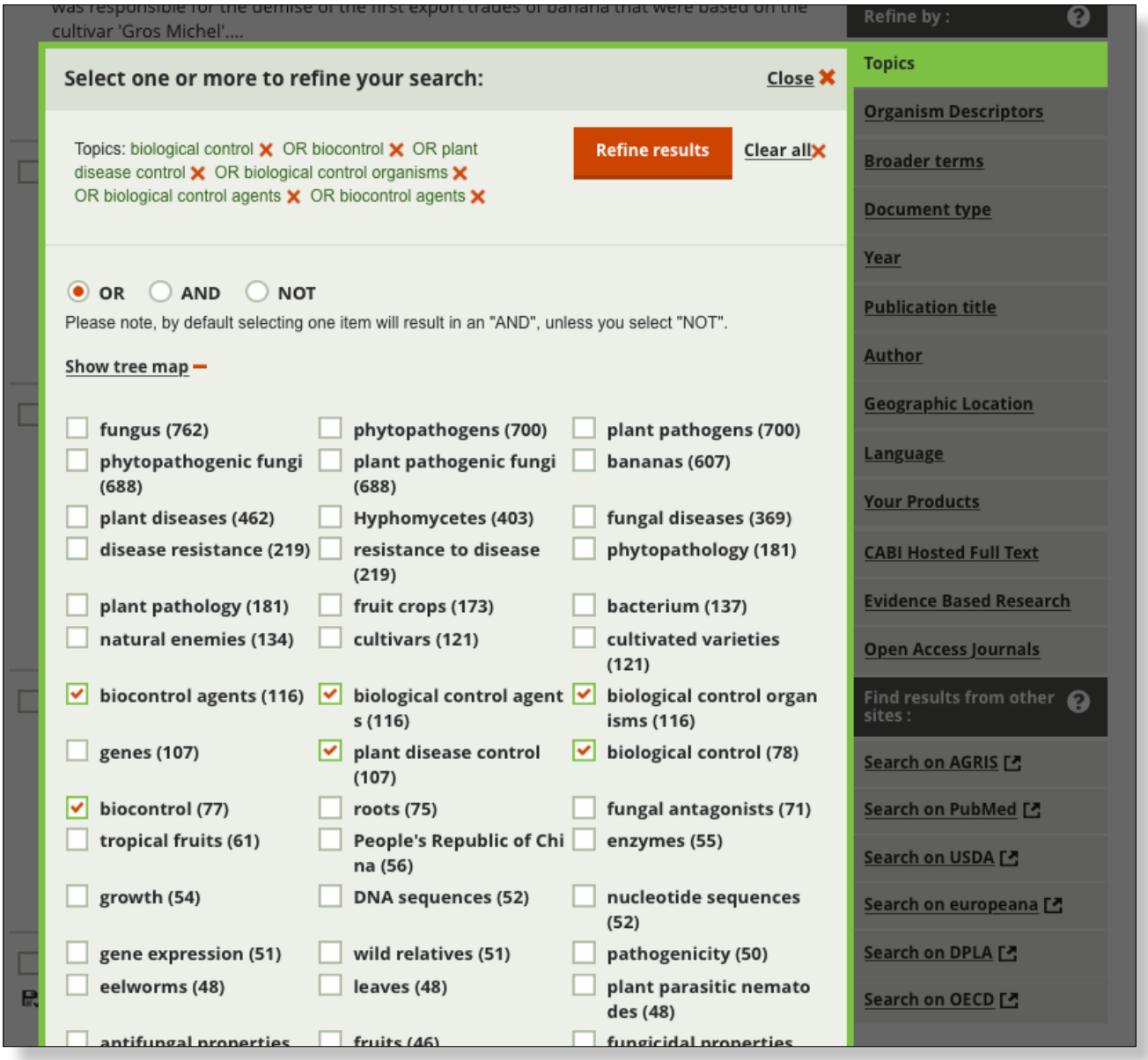
The abstract below describes a sensitive, specific and rapid detection method (real time PCR) for determining infection – the first step for preventing disease spread and implementing control measures.

With CAB Direct we can create our own notes, by annotating records, to add context and meaning.

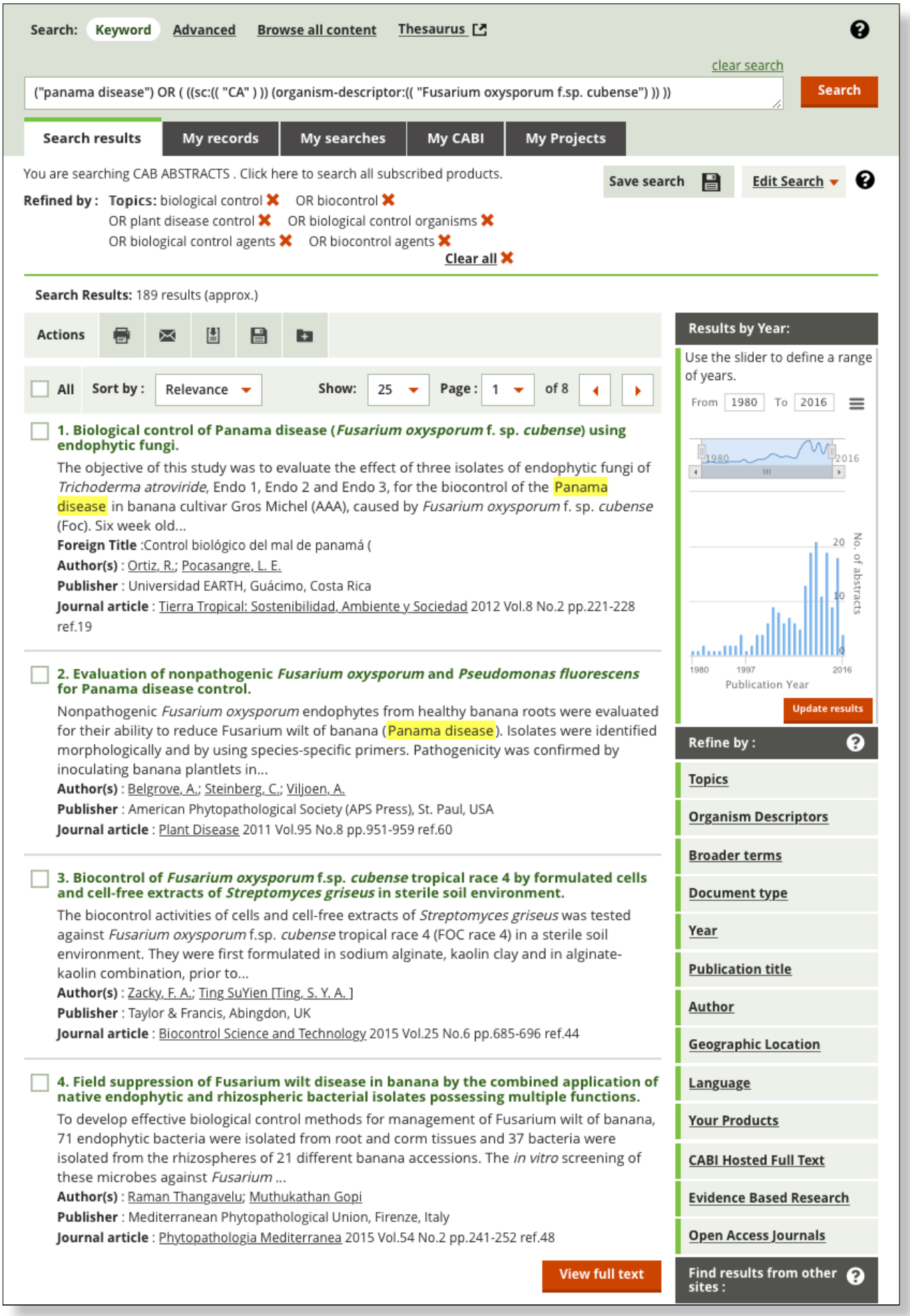


With CAB Abstracts on CAB Direct, you can easily extend your query.

Using the Topics function, research into control methods can be found in CAB Abstracts.



The results show that an endophyte is one of the methods of control in the research literature.



Results include an article suggesting that the endophytes have shown positive results.

Search: Keyword | Advanced | Browse all content | Thesaurus

clear search

Enter keyword search

Search

Search results | My records | My searches | My CABI | My Projects

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Actions | Choose a colour

In planta biocontrol of soilborne Fusarium wilt of banana through a plant endophytic bacterium, *Burkholderia cenocepacia* 869T2.

Author(s) : Ho YingNing; Chiang HsingMei; Chao ChihPing; Su ChingChung; Hsu HuiFang; Guo ChenTong; Hsieh JuLiang; Huang ChiehChen
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Journal article : Plant and Soil 2015 Vol.387 No.1/2 pp.295-306 ref.42
ISSN : 0032-079X
URL : http://rd.springer.com/journal/11104
Record Number : 20153068874

Abstract :
Aim: Fusarium wilt (Panama disease) caused by *Fusarium oxysporum* f. sp. *cubense* tropical race 4 (Foc TR4) is a soilborne disease that severely devastates the banana industry worldwide. We aimed to isolate beneficial endophytic bacterial strains against Panama disease. Methods: From different plant species, including reeds (*Phragmites australis*), vetiver grass (*Chrysopogon zizanioides*), and banana plants (Cavendish cv. Pei-Chiao, Cavendish cv. Formosana, and Musa sapientum cv. Rose), endophytes were screened and characterized. The diversity and community of endophytes within banana plants were analyzed by PCR-denaturing gradient gel electrophoresis (DGGE). The banana tissue culture plantlets were inoculated with the candidate endophyte, *Burkholderia cenocepacia* 869T2, and effects of *in planta* biocontrol were observed. Results: Endophytic *B. cenocepacia* 869T2 decreased the disease incidence of Fusarium wilt on treated banana plants to 3.4%, comparing to 24.5% of non-inoculated plants infected in the field test within a 7-month period. Furthermore, significant growth promoting of 869T2 inoculated banana plants was observed in field experiments. Conclusions: In addition to 869T2 genomic sequence data, our results suggest that the pyrrolnitrin and pyrroloquinoline quinone potential producer, *B. cenocepacia* 869T2, is a good biological control agent (BCA) for use in the biocontrol of Fusarium wilt and plant promotion.

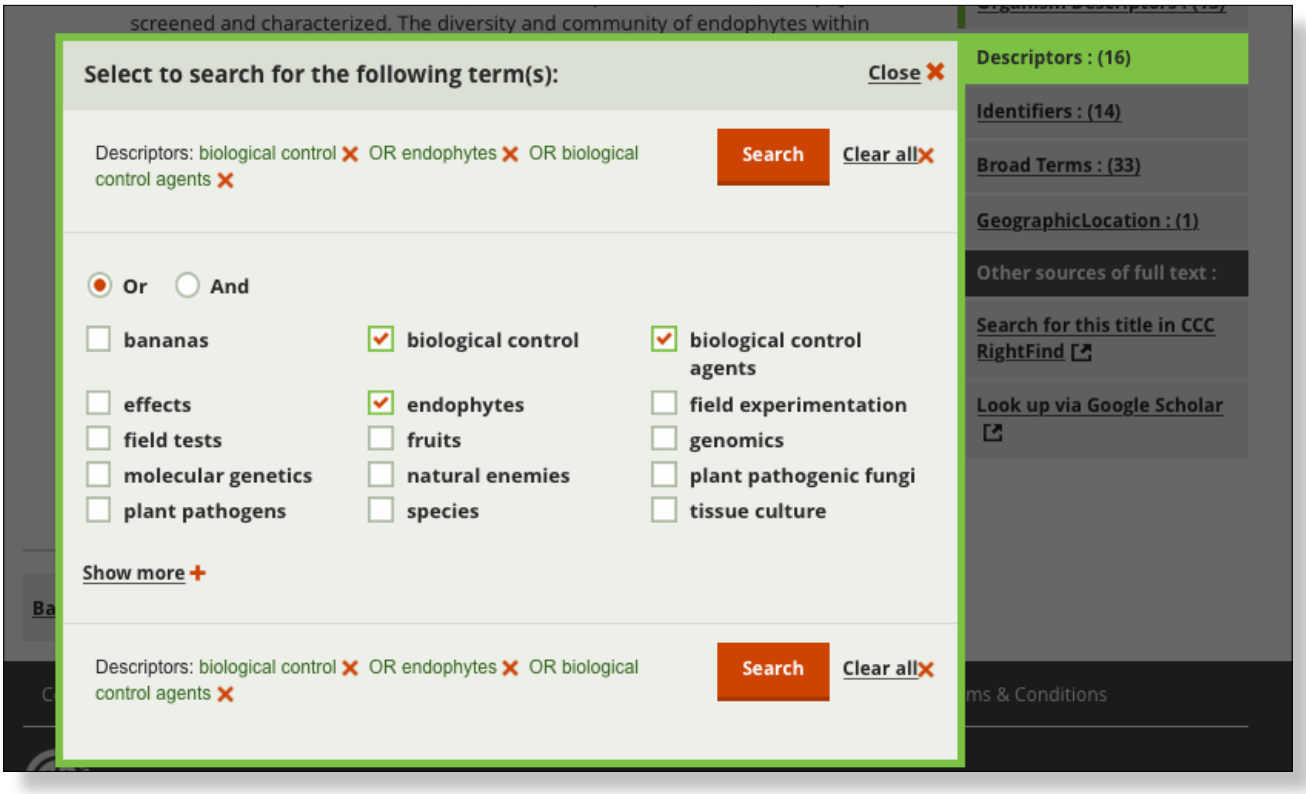
Publisher : Springer
Location of publication : Dordrecht
Country of publication : Netherlands
Language of text : English
Language of summary : English

Explore similar records
- Phillyrin produced by Colletotrichum...
- Screening antimicrobial activity of...
- Studies on endophytic fungi associated with...
- Isolation of endophytic bacteria from...
- Control efficiency of endophytic...
- Isolation, biochemical and PGP...
- Show all similar records

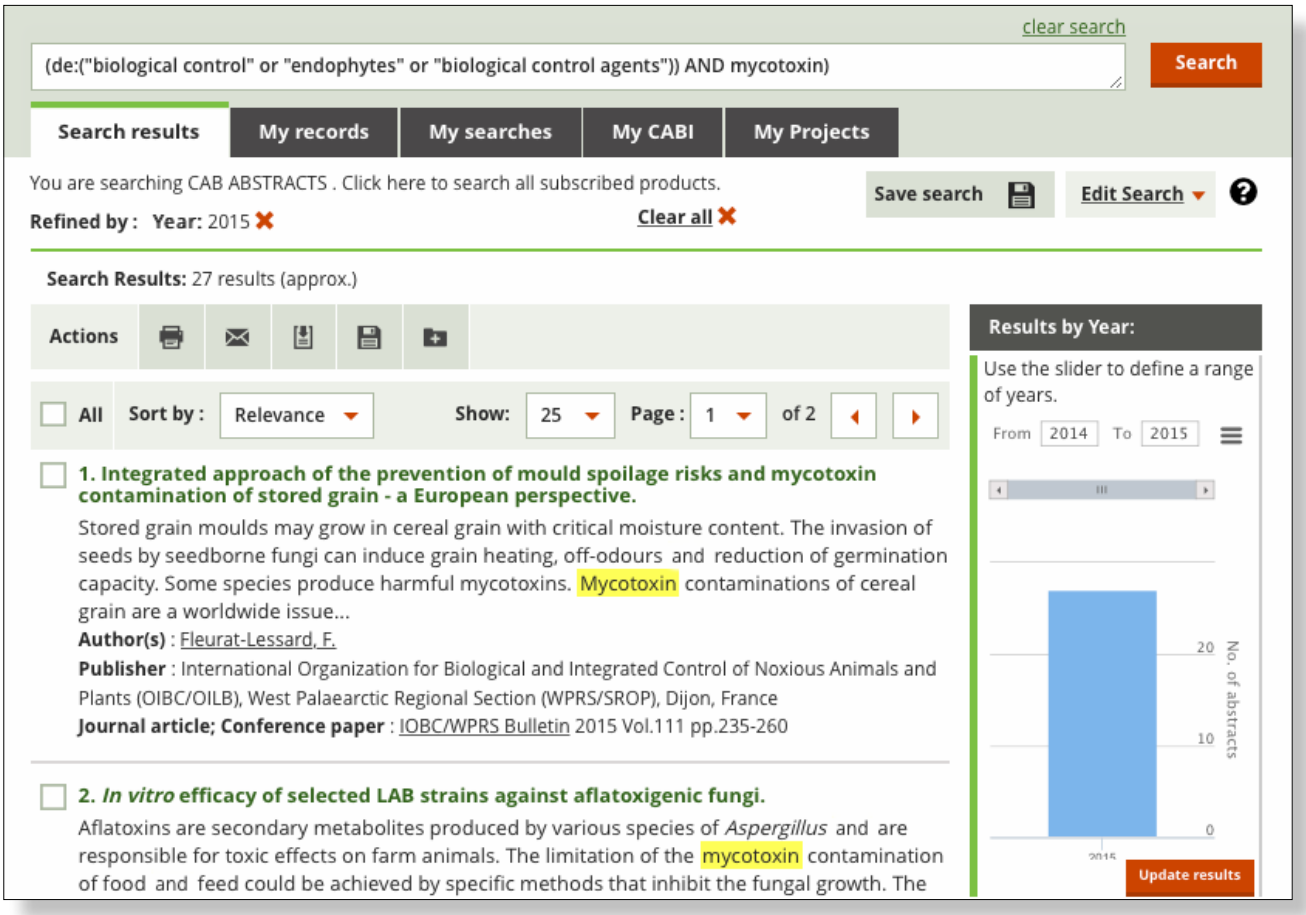
Indexing terms for this record :
- Organism Descriptors : (13)
- Descriptors : (16)
- Identifiers : (14)
- Broad Terms : (33)
- GeographicLocation : (1)

Other sources of full text :
- Search for this title in CCC RightFind
- Look up via Google Scholar

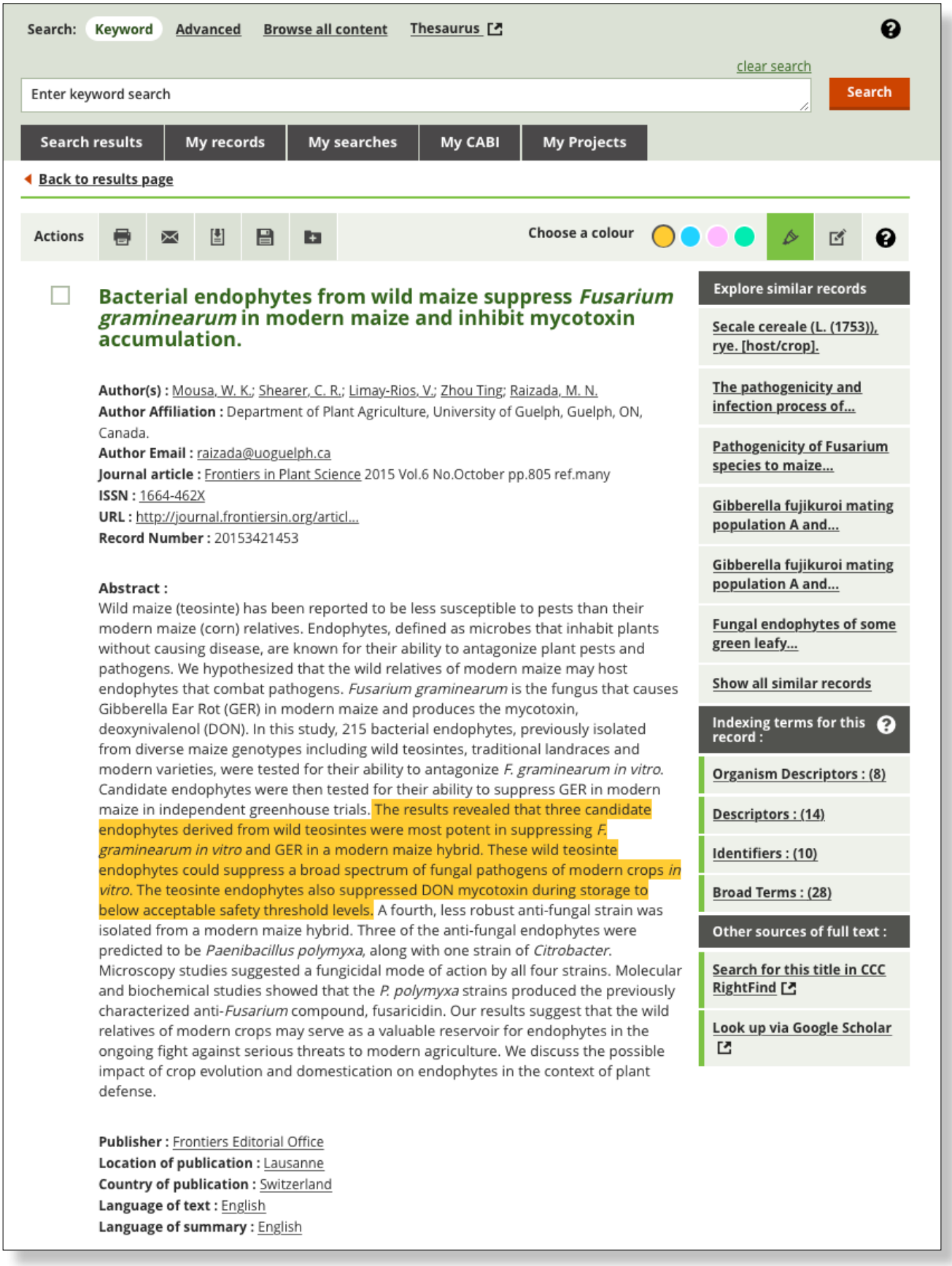
We can use CAB Direct to create a new search based on the index terms from the previous record.



By simply adding an additional keyword (via Edit Search), CAB Abstracts can be used to look for other relevant research into endophytes that could provide additional insights, in this case, mycotoxins.



We find evidence that mycotoxin accumulation can be inhibited when used against a different Fusarium species.



Search: Keyword Advanced Browse all content Thesaurus

clear search

Enter keyword search

Search

Search results | My records | My searches | My CABI | My Projects

Back to results page

Actions

Choose a colour

Bacterial endophytes from wild maize suppress *Fusarium graminearum* in modern maize and inhibit mycotoxin accumulation.

Author(s) : Mousa, W. K.; Shearer, C. R.; Limay-Rios, V.; Zhou Ting; Raizada, M. N.
Author Affiliation : Department of Plant Agriculture, University of Guelph, Guelph, ON, Canada.
Author Email : raizada@uoguelph.ca
Journal article : Frontiers in Plant Science 2015 Vol.6 No.October pp.805 ref.many
ISSN : 1664-462X
URL : http://journal.frontiersin.org/articl...
Record Number : 20153421453

Abstract :
Wild maize (teosinte) has been reported to be less susceptible to pests than their modern maize (corn) relatives. Endophytes, defined as microbes that inhabit plants without causing disease, are known for their ability to antagonize plant pests and pathogens. We hypothesized that the wild relatives of modern maize may host endophytes that combat pathogens. *Fusarium graminearum* is the fungus that causes Gibberella Ear Rot (GER) in modern maize and produces the mycotoxin, deoxynivalenol (DON). In this study, 215 bacterial endophytes, previously isolated from diverse maize genotypes including wild teosintes, traditional landraces and modern varieties, were tested for their ability to antagonize *F. graminearum in vitro*. Candidate endophytes were then tested for their ability to suppress GER in modern maize in independent greenhouse trials. The results revealed that three candidate endophytes derived from wild teosintes were most potent in suppressing *F. graminearum in vitro* and GER in a modern maize hybrid. These wild teosinte endophytes could suppress a broad spectrum of fungal pathogens of modern crops *in vitro*. The teosinte endophytes also suppressed DON mycotoxin during storage to below acceptable safety threshold levels. A fourth, less robust anti-fungal strain was isolated from a modern maize hybrid. Three of the anti-fungal endophytes were predicted to be *Paenibacillus polymyxa*, along with one strain of *Citrobacter*. Microscopy studies suggested a fungicidal mode of action by all four strains. Molecular and biochemical studies showed that the *P. polymyxa* strains produced the previously characterized anti-*Fusarium* compound, fusaricidin. Our results suggest that the wild relatives of modern crops may serve as a valuable reservoir for endophytes in the ongoing fight against serious threats to modern agriculture. We discuss the possible impact of crop evolution and domestication on endophytes in the context of plant defense.

Publisher : Frontiers Editorial Office
Location of publication : Lausanne
Country of publication : Switzerland
Language of text : English
Language of summary : English

Explore similar records

Secale cereale (L. (1753)), rye. [host/crop].

The pathogenicity and infection process of...

Pathogenicity of Fusarium species to maize...

Gibberella fujikuroi mating population A and...

Gibberella fujikuroi mating population A and...

Fungal endophytes of some green leafy...

Show all similar records

Indexing terms for this record :

Organism Descriptors : (8)

Descriptors : (14)

Identifiers : (10)

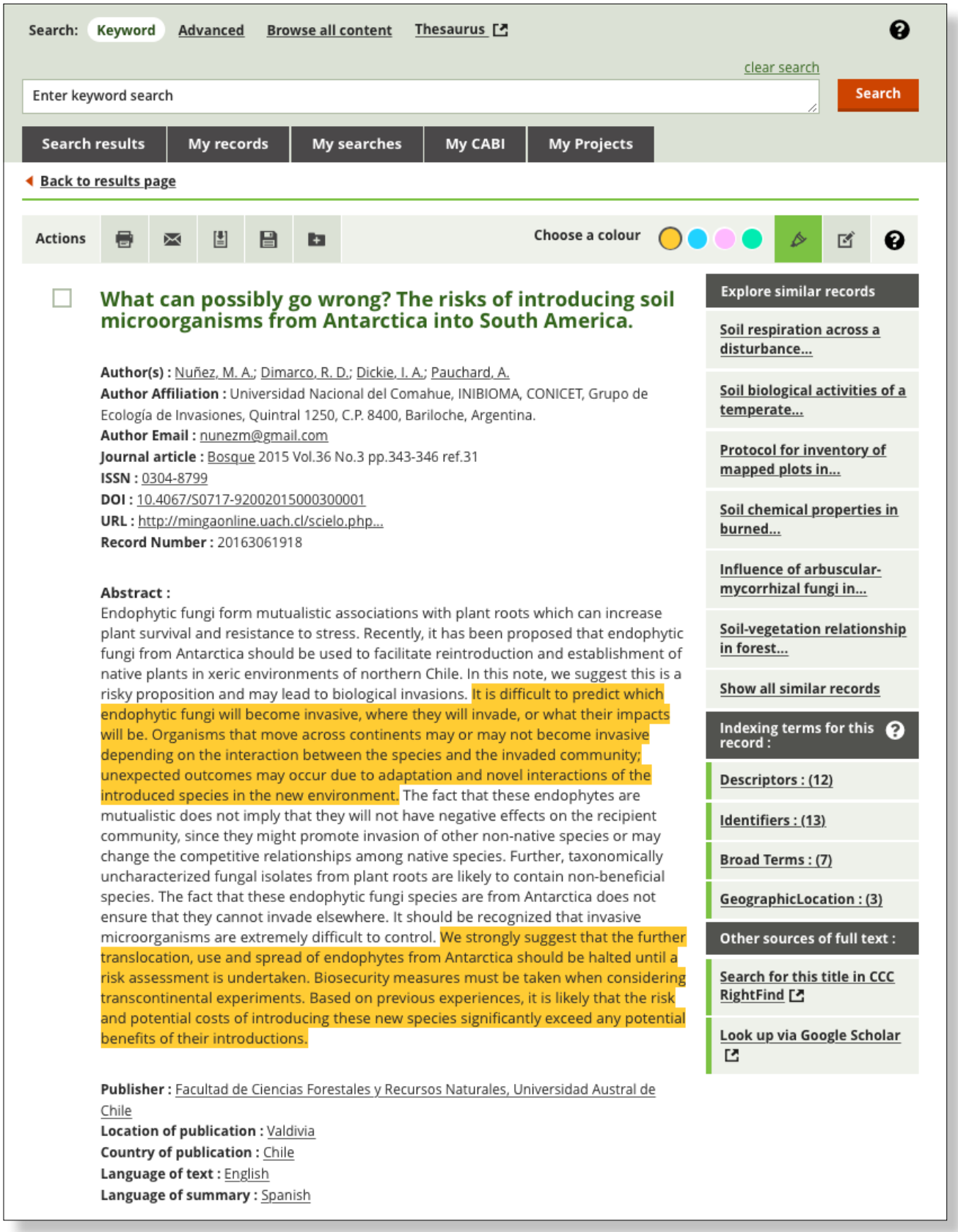
Broad Terms : (28)

Other sources of full text :

Search for this title in CCC RightFind

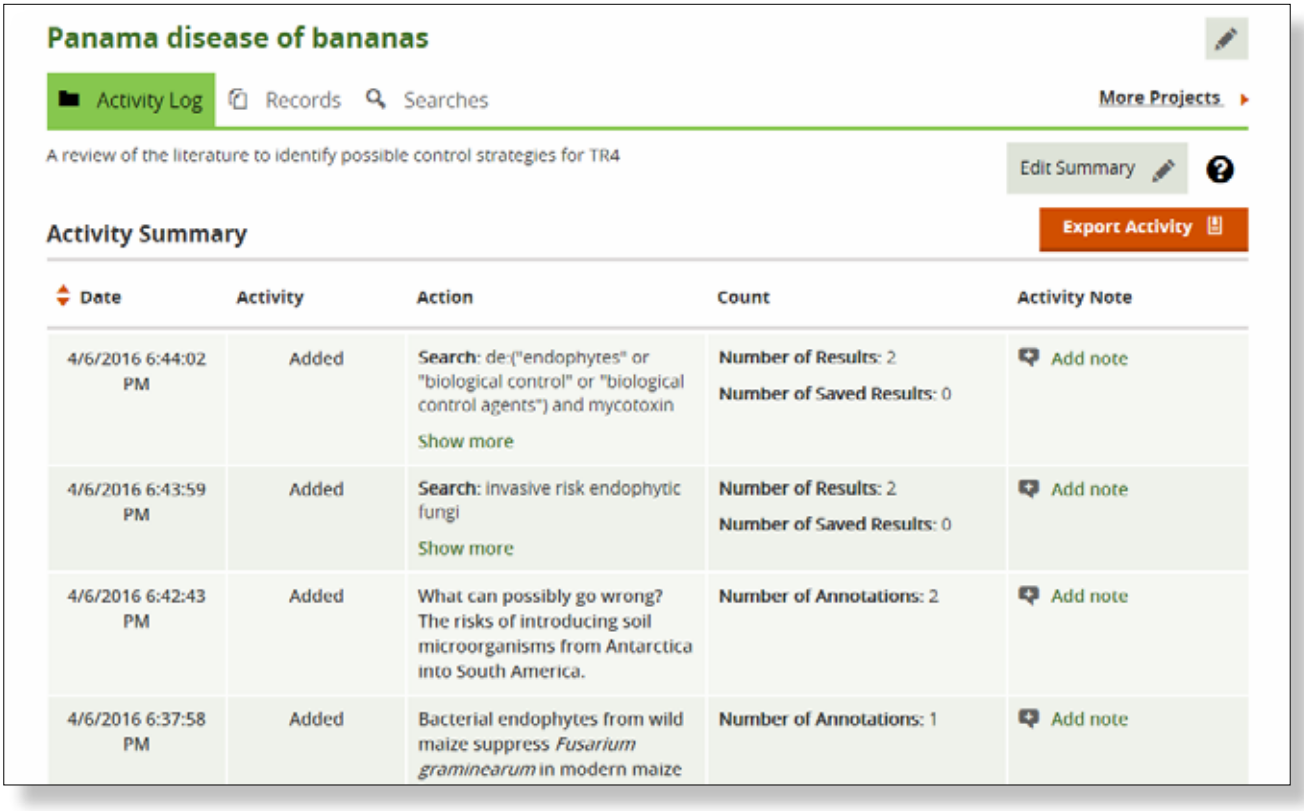
Look up via Google Scholar

However, the research shows that there may be potential risks, and CAB Abstracts covers research that examines the risks of introducing invasive endophytes too.



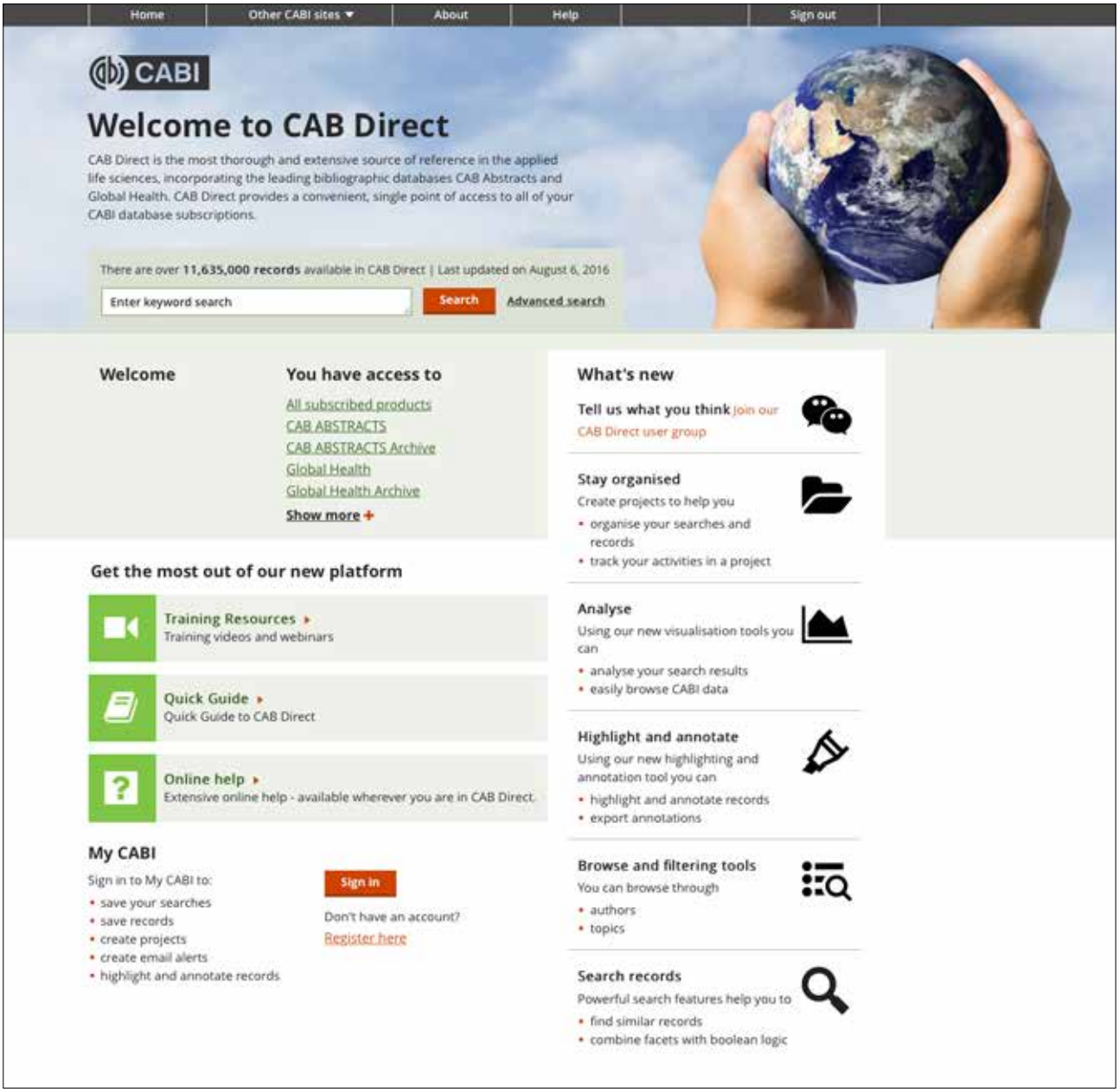
My Projects on CAB Direct not only gives you an efficient way to group and manage your work, it also automatically generates an exportable log of your activities on the project.

This gives you a quick and simple way to track and report on what you have been working on.



available on your chosen platform

CAB Abstracts on **CAB Direct** combines sophisticated search capabilities with useful features like **My Projects**, highlighting and annotating, in a clear and easy to use interface.



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PB-CD4-CSPB-08-16