

# Bibliometric analysis of a land grant university experiment station's interdisciplinary grant program

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## INTRODUCTION

**agbioscience!** the integration of scientific disciplines to address critical needs of food security, safety and health; environmental sustainability; and biobased energy, fuel and products

As the research arm of The Ohio State University's College of Food, Agricultural, and Environmental Sciences (CFAES), the Ohio Agricultural Research and Development Center (OARDC) is the largest agbioscience research facility in the United States. In addition to CFAES, OARDC scientists work in OSU's Colleges of Education & Human Ecology, Veterinary Medicine, and Arts & Sciences.

The goal of SEEDS: The OARDC Research Enhancement Competitive Grants Program is to address the differing challenges and opportunities of Ohio's agbioscience industry. There are 7 SEEDS grant competition categories five of which are highlighted below:

- Seed** to stimulate new research;
- Interdisciplinary Team** to stimulate collaboration between at least 3 different academic units;
- Matching** to initiate projects with funding support from an external collaborator;
- Industry** to initiate projects with industry and non-profits; and
- Doctoral** to support graduate student research (OARDC, 2015).

**bibliometrics:** the quantitative analysis of research literature based on citations

Bibliometrics is one measure of the impact on the academic community, or scientific productivity, of a publication, individual, group, or institution. This analysis of SEEDS provides the OARDC with information to assist in evaluating commitment to the grant program.

## PURPOSE & OBJECTIVES

The purpose of this study is to investigate the level of scientific productivity of OARDC SEEDS grant program by bibliometric analysis of grant-funded research publications. Objectives include:

1. Calculate the Hirsch index (H-index) of the entire grant and each competition
2. Calculate the average citations per item for the entire grant program and each competition
3. Compare the productivity of the SEEDS Interdisciplinary Team competition to the other competitions

## METHODS

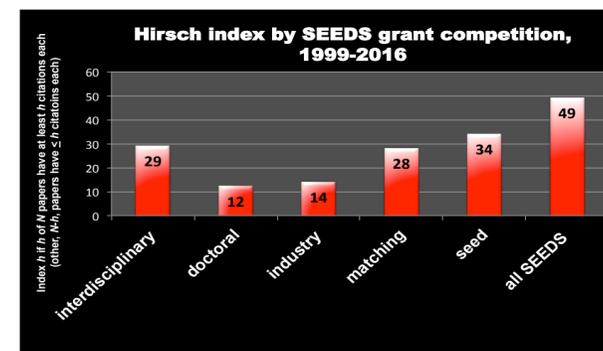
Citation reports were generated using Thomson Reuter's Web of Science (WoS). WoS is recognized as the world's largest collection of research data, books, journals, proceedings, publications, and patents (Thomson Reuters, 2015). An Excel spreadsheet of all publications from 1999-2016 resulting from SEEDS grant funded research was supplied by the OARDC. The spreadsheet consisted of 2,497 items.

Relying on authors to acknowledge affiliation with an institute is a common source of error as there is no standard mechanism for identification (van Raan, 2005). To avoid this error, the publication titles were used as the search term. Another source of error is the different ways a name or title can be spelled or worded (Andrés, 2009). Each entry on the OARDC list was cross checked to accurately identify the title and authors.

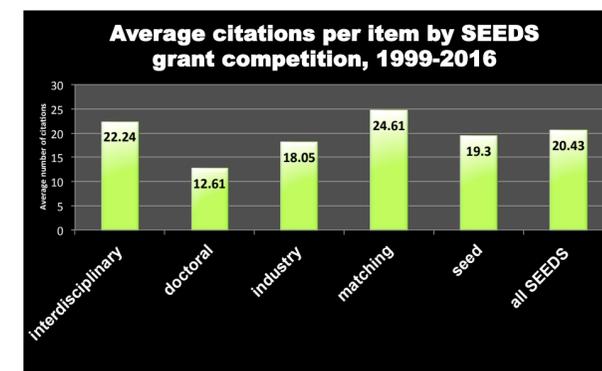
Publications were grouped by grant competition into separate marked lists on WoS. The entire set of SEEDS publications was also entered as a marked list.

## RESULTS

After accurately identifying the title and authors, 579 SEEDS grant publications were found in the WoS databases. Results include papers, conference proceedings, book chapters, patents, and doctoral dissertations. Along with the results for the SEEDS grant program as a whole, five of the competitions are presented here and were selected based on having a minimum of 35 results in WoS.



- H-index of x if x published works have at least x citations each
- H-index combines measures of productivity and impact into one indicator
- Huang (2011) found 32.41 as the mean H-Index of US universities ranked in the top 500 in the world



- Thomson Reuters Essential Science Indicators Database found the citation average in agricultural sciences to be 7.05 citations per item for the period 2000-2010

Table of selected results by competition, 1999-2016

Title of competition	Number of results found in WOS databases	Sum of times cited	Percentage receiving 10 or more citations
interdisciplinary	153	3402	51.00%
doctoral	41	517	31.10%
industry	38	686	39.50%
matching	98	2412	50%
seed	195	3764	47.70%
all SEEDS pubs.	579	11,871	33.30%

## CONCLUSIONS

- Interdisciplinary Team, Seed, & Matching competitions have consistently high levels of productivity across measures
- Interdisciplinary Team has highest percentage of publications with 10 or more citations
- Interdisciplinary Team has the second highest H-index and average citations per item
- Average citations per item of SEEDS grant program as a whole & individual competitions measure above average when compared with agricultural science field
- H-index of the SEEDS program & several competitions is at or above average with research institutions.

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