From the President

Season's Greetings Everyone,

I hope everyone has had a wonderful fall season and Thanksgiving holiday. It certainly has flown by! Speaking of things flying by, here in Florida we are continuing to assess the damage and impact that hurricane Irma has had on the state's agricultural industries. Citrus, ornamental, and vegetable crops were affected throughout the entire state, due to the path of the storm, which went from Key West to Jacksonville. Thankfully, hurricane season is over for now, and hopefully next year we will have a less active storm season.

We will soon have a transition to a new Editor-in-Chief of the Journal of Nematology. David Shapiro-Ilan will take over duties as the new Editor-in-Chief beginning in January 2018. The journal has been doing very well under the leadership of the current Editor, Andrea Skantar, and I want to thank Andrea for all her effort and dedication to improving JON. I’m sure David will continue to build on Andrea’s success and increase the quality and impact of JON under his leadership. Please continue to submit your research papers and encourage your students to submit their papers to JON. Also please encourage your students to become involved in their Society by serving on committees and presenting research results at the Annual Meeting.

I would like to remind everyone to pay your SON dues on time. Memberships are set to renew at the beginning of the calendar year so please go on-line and renew your membership. Also, remind your students and colleagues of all of the opportunities to make an impact by joining and being an active member of SON. We welcome input from everyone on how we can become more productive and have greater scientific impact in these important times. Also remember that retired members can request emeritus status free for life. We value all of the experience and wisdom of our retired members and want to strongly encourage them to remain active in our society.

As we look forward to the New Year, please plan ahead to attend the 2018 SON meeting in Albuquerque, NM.
The meeting will be held on July 22-25, 2018 at the Hyatt Regency – Downtown, adjacent to the Albuquerque Convention Center in the heart of downtown Albuquerque. This is a great location just two blocks from Central Avenue with its many restaurants, shops, art galleries, tap rooms, and microbreweries. The venue is less than a mile from the Old Town historic district and two blocks from the rapid transit rail station to Santa Fe, which is about 70 miles (1.5 hrs) away. Our President-Elect Billy Crow is very excited to be in charge of the technical program this year, and is planning great things. Please let Billy know if you have any ideas regarding the technical program, or if you want to be involved in organizing or assisting with a session. I look forward to seeing everyone again in Albuquerque and I hope everyone has a wonderful and safe holiday season!

All the Best,

Nancy Burelle

Announcing the 57th Annual Meeting of the Society of Nematologists in Albuquerque, New Mexico, July 22-25th, 2018

Planning for the 56th Annual Meeting of the Society of Nematologists are currently underway. Steve Thomas is the Chair of the Local Arrangements Committee and Billy Crow is the Chair of the Program Committee. If you have any ideas or suggestions that you would like to be considered, please feel free to ask.

Please take a look at the following resources to get the most out of your visit to Albuquerque, New Mexico. We are looking forward to seeing you there and renewing old friendships and establishing new acquaintances. We can’t wait to hear about your current research, as well. Keep your eyes open for the call for abstract submission coming in the next Nematology Newsletter.

https://www.visitalbuquerque.org
https://www.visitalbuquerque.org/about-abq/history/
https://www.tripadvisor.com/Attractions-g60933-Activities-Albuquerque_New_Mexico.html
Announcing the 7th International Congress of Nematology 2020: Continuing a Tradition We Can All Support

The nematology congresses have always been universal in scope, gathering scientists from countries spanning the tropics, subtropics, and temperate regions on both sides of the equator. The diverse venues of the past - Canada, Netherlands, Guadeloupe, Canary Islands, Australia, South Africa – reflect a tradition of making these congresses a reunion of the entire nematology family. This kind of special ‘family’ tradition is reason enough to look forward to the next congress in 2020. But the terrific opportunities afforded by the next venue and program are also why all of us should be sure not only to attend, but to help in our various ways to support ICN 2020.

During 3-8 May 2020 we will gather in Juan les Pins - Antibes, a Riviera community long famous for its hospitality, charm and affordability. The local organizers and the ESN host society have gone all out and are working hard to ensure that the congress will provide the best science in a wonderful place at a cost that is affordable to everyone who wishes to attend. Early May is the perfect time to be on the French Rivera, for the weather and to beat the summertime crowds.

The convention center is just 17 km from the Nice airport – 20 minutes by bus. Juan-Les-Pins has an exceptionally large number of hotels at every price range including a hostel with 100 beds that will be dedicated to the congress. The convention hall is in the city center, with numerous cafes, restaurants and hotels within just a few blocks and the conference hotel next door. Cars are unnecessary. There are many cultural and leisure activities in walking distance for accompanying persons/families – major art and history museums, medieval neighborhoods, beaches, parks, casinos, and shopping. Moreover, Antibes is central to other holiday destinations throughout Europe for those who want to extend their trip.

The International Federation of Nematology Societies works closely with the host society and the local organizers to develop the scientific program and to ensure that support is available to aid participation by as many speakers, students and scientists as possible. This work is done by the IFNS Vice President (scientific program) and by a fundraising committee comprised of IFNS councilors and interested colleagues. But regardless of how many individuals help with the formal operations, each of us can contribute substantially to these key activities.

The critical bits of a scientific program are the topics and the session chairs who will invite the speakers in each subject area to best cover the current states of the art. Ernesto San Blas has prepared a comprehensive list of topics and organizers based partly on topics from the last congress and on suggestions provided by some of the IFNS councilors. The list is circulating among all councilors who will work to narrow it down to a preliminary program. Next spring this draft program will be presented to all societies for comment and further refinement with the goal of having a final program in place by early 2019. There can’t be too much input or too many ideas during the early stage of program formation. What topics are most important or exciting to you? What novel or non-traditional areas might inform nematologists in important ways? Who do you think would best organize a given topic and do you know scientists outside of nematology that we should hear from (or who should learn what we do)? Is there a workshop that would be especially helpful? Your ideas are most welcome so please send your suggestions to your councilor(s) (http://www.ifns.org/home; click ‘membership’) or Ernesto (esanblas@yahoo.com) and thanks in advance for your help.

Another important ICN tradition is an emphasis on fundraising to support travel awards. Much of the money has come from commercial supporters, but a significant number of awards are traditionally provided by the foundations associated with some societies. The ONTA Foundation (http://www.ontaweb.org/mission/) and the Cobb Foundation (http://www.crec.ifas.ufl.edu/societies/nacobb/cobb_foundation.shtml) support, among other things, student travel to the annual meetings of ONTA and SON and they are an important source of travel grants at
the congresses. Donating to such foundations represents a permanent gift to nematology, because our contributions grow the endowment funds that support activities such as travel grants from the interest they generate. Some foundations even provide donors a choice between different funds that support specific activities. So if you are wondering how best to contribute financially to the wellbeing of our science, don’t forget the opportunities provided by the nematology foundations.

The ICN 2020 website will be launched immediately following the ESN meeting in September 2018. In the meanwhile, keep abreast of congress plans and many other things ‘nematological’ at the IFNS Twitter site @Nematologists.

Looking forward to seeing all of you in Antibes!

Andreas Westphal  Ernesto San-Blas  Larry Duncan
Secretary   Vice-President  President

Iowa State University

What area(s) of molecular plant-microbe interactions do you feel your research has impacted most?

I think our work and that of our collaborators was instrumental in bringing plant nematology into the next phase of research questions and approaches. We led plant nematology away from pure field work aimed at identifying novel management options and toward using molecular and genomic tools to explore plant-nematode interactions.

What advice do you have for young scientists aspiring to achieve the level of science that has major impact?

You are probably in it for the long haul. Find something you are passionate about because “(professional) life goes on long after the thrill of living (as a researcher) has gone”—John Mellencamp got it right. You need to be able to maintain your curiosity, idealism, and fun. Otherwise, you might run out of steam down the road. You need to be able to reinvent yourself and let go of old ideas to embrace new ones. Otherwise, you just might run out of funding down the road. You need to take care of your people and collaborators and be a trusted team member. Otherwise, you just might run out of friends down the road.

When you were a post-doc, what had the largest influence on your decision to enter your specific research area in your permanent position? Was this a “hot topic” at the time, or did you choose to go in a different direction?

My field of research was not a hot topic when I entered it. I got into it because it was exciting biologically—and it still is. I listened to Dick Hussey, University of Georgia, give a talk when I was a graduate student and that was all I needed. I knew that was what I wanted to do. Sedentary nematodes delivering proteins into their host plants to form a feeding structure is just cool. And over the years, our field developed into one of the hottest areas in plant pathology. As it turned out, we were working on effectors all these years and we never knew it! We thought we were working on nematode “spit”—how naïve.
Multi-State Regional Project S-1066 Meets in Raleigh, North Carolina

The Multi-State Regional Project S-1066 met at the North Carolina Department of Agriculture and Consumer Services in Raleigh, N.C. on Nov. 13-14. After the state reports and presentations by several graduate students were completed, the group was given a tour of the nematode assay facilities by its director, Dr. Weiman Ye. He showed how this lab processes more than 40,000 nematode assays each year, as well as a significant number of pinewood nematode assays.
Call for Applications for the John Webster Outstanding Student Award

The Nathan A. Cobb Nematology Foundation is pleased to call for nominations for The John M. Webster Outstanding Student Award for 2018. This award is to recognize a graduate student who has demonstrated outstanding accomplishments in his/her thesis research in Nematology as well as other skills necessary to be a well-rounded scholar.

Students in their final year of a Master's or Ph.D. degree shall be eligible for this award and shall be nominated by a mentor or peer. The nomination will include a letter from the nominator, and a one-page description of his/her research written by the student. The nomination letter should describe the student's educational background, grade-point average, contributions and merit; a brief CV (e.g., 2 pages) should also be included.

The recipient of the award will receive a plaque and will make a 30-minute oral presentation of their research at the 57th Annual Meeting of the Society of Nematologists, July 22-25th 2018 in Albuquerque, NM. The presentation will be designated in the Program and Abstracts book as the John Webster Outstanding Student Presentation. The recipient may also present a different aspect of their research in the Student Paper or Poster Competition.

The deadline for receiving nominations is midnight (Eastern Standard Time) on February 28, 2018.

Please send nominations via e-mail to:
Nathan Schroeder, Ph.D.
Email: nes@illinois.edu
Department of Crop Sciences
University of Illinois at Urbana-Champaign
Urbana, IL 61801
tel: (217)-244-6128

Meetings of Interest to Nematologists

January 22-26, 2018. Entomopathogenic nematodes - New species description. cbazelet@sun.ac.za


August 12-16, 2018. SIP Annual Conference in Gold Coas Australia http://www.sipweb.org/meetings.html

September 9-13, 2018: Meeting of the European Society of Nematologists in Ghent, Belgium. https://www.esn-online.org/conference

Aug. 4-7, 2019. APS annual meeting in Cleveland, OH
A Plea for Supporting the N.A. Cobb Nematology Foundation

Hello fellow nematologists. Please consider helping build a legacy to benefit the science of nematology by supporting the Nathan A. Cobb Nematology Foundation.

As we enter this holiday shopping season (and throughout the year), here is a simple way to help generate donations to the Nathan A. Cobb Nematology Foundation: For anything you purchase from Amazon, use their AmazonSmile portal and Amazon will make a donation to the Foundation. Support the Nathan A. Cobb Nematology Foundation when you shop. Go to smile.amazon.com/ch/20-1163147 and Amazon donates to the Nathan A Cobb Nematology Foundation.

AmazonSmile is a website operated by Amazon with the same products, prices, and shopping features as Amazon.com. The difference is that when you shop on AmazonSmile, the AmazonSmile Foundation will donate 0.5% of the purchase price of eligible products to the Nathan A. Cobb Nematology Foundation if you designate it as your charitable organization. For the past couple of years, the AmazonSmile Foundation has donated about $50 per year to the Cobb Foundation, but that could be increased greatly if more people used this service when shopping on Amazon.

The Nathan A. Cobb Nematology Foundation was created by the Society of Nematologists as a charitable organization to support the science of nematology. All members of SON are also members of the Cobb Foundation. Donations received by the Cobb Foundation are added to one of eight endowments and the earnings from those endowments are used to support the activities of the Foundation. Since its inception, the Foundation has funded more than 50 student travel awards, but plans are to also fund symposia, workshops, and other activities as earning from the endowments increase. Your donations help build a legacy that will continue to benefit our science throughout our careers and beyond.

The Nathan A. Cobb Nematology Foundation is a 501c3 charitable organization. Donations made directly to the Foundation are tax deductible in the United States. Donations may be made through the SON website at https://nematologists.org/products/donation-na-cobb/.

Thank you for your support of the Foundation.

Sincerely,

Richard F. Davis
Chair, N. A. Cobb Foundation

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Job Announcement

Assistant/ Associate Professor – Belowground Plant Ecology/ Root Microbial Interactions

Haines Family Professorship in Plant Biology

POSITION TITLE AND DESCRIPTION: Assistant or Associate faculty position in the area of Belowground Plant Ecology/ Root Microbial Interactions. This 9-month tenure-track position will be jointly appointed in the Departments of Plant Biology (Franklin College of Arts & Sciences) and Plant Pathology (College of Agricultural & Environmental Sciences) at the University of Georgia (UGA), starting January 2019. The position will have available research funds from a Haines Family Professorship endowment.

MAJOR RESPONSIBILITIES: The incumbent will address fundamental ecological and evolutionary questions in plant ecology with an emphasis on plant roots and their interactions with the soil environment, specific soil organisms, and/or the root microbiome. Field-based research should be integrated with other approaches (e.g. modeling, computational, molecular, genomic). The successful candidate will be expected to maintain a high-impact, externally funded research program in below-ground plant ecology; mentor undergraduate students, graduate students, and/or postdoctoral scholars across relevant disciplines; and teach undergraduate and graduate-level courses.

QUALIFICATIONS: Candidates must have a PhD in Plant Biology, Plant Pathology, Ecology, or related field. Candidates to be considered for Associate Professor must have an established extramurally-funded research program. The successful candidate will be expected to maintain a high-impact, externally funded research program in below-ground plant ecology; mentor undergraduate students, graduate students, and/or postdoctoral scholars across relevant disciplines; and teach undergraduate and graduate-level courses.

SALARY: Salary commensurate with qualifications and experience.

APPLICATION PROCEDURE: Inquiries about the position should be directed to Dr. Jim Leebens-Mack, Chair of the Search Committee (jleebensmack@uga.edu). All application materials must be submitted via the university's faculty job portal at https://facultyjobs.uga.edu/postings/3265. Materials to be uploaded include: a) cover letter, b) resume/vitae, c) statement of research accomplishments and goals, d) statement of teaching accomplishments and philosophy that relate to NSF-AAAS Vision and Change, e) 3 highest impact publications combined into 1 PDF, and f) names and e-mail addresses of four referees who will receive an online link for submitting letters of reference. Review of applications will begin on February 28, 2018, and continue until the position is filled.

INSTITUTIONAL INFORMATION: UGA, a Land/Sea Grant institution located 90 miles northeast of Atlanta, is ranked 16th among public universities in the U.S. News & World Report’s 2018 edition of America’s Best Colleges. The Departments of Plant Biology and Plant Pathology encompass a broad range of disciplines and have historical strengths in plant ecology, evolutionary biology and plant-associated microbiology. UGA offers a vibrant research environment with potential collaborations with faculty across the plant sciences (https://plantcenter.uga.edu/), the Odum School of Ecology, and the Complex Carbohydrate Research Center, among others. Opportunities for off-campus interactions include the Savannah River Ecology Lab, the Coweeta Hydrologic Lab, the Sapelo Island Microbial Observatory, and several research farms and Research and Education Centers in the College of Agricultural & Environmental Sciences. Athens, GA, is consistently ranked highly for its quality of life and vibrant culture (https://www.visitathensga.com).

UGA is an EEO/AA/Vet/Disability Institution. As such, we are especially interested in candidates who can contribute to the diversity and excellence of the academic community. We not only strongly encourage women, minorities and other diverse candidates to consider applying for this position, but we also maintain that all candidates should share our commitment to diversity and inclusion. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, disability, gender identity, sexual orientation or protected veteran status. Persons needing accommodations or assistance with the accessibility of materials related to this search are encouraged to contact Central HR (facultyjobs@uga.edu). Please do not contact the department or search committee with such requests.
Call for Nematode Trading Card Submissions

Please consider making your submission(s) to the first Nematode Trading Card Competition by the Society of Nematologists. The resources for making the cards in Adobe®Photoshop or Photoshop Elements can be downloaded from the Nematology Newsletter dropbox. Six different templates are available for the following categories: 1. People (red background), 2. Nematodes (green background), 3. Habitats (yellow background), 4. Morphology (orange background) 5. Symptoms (purple background) and 6. Control (blue background). The back of the cards will be provided to unify the cards into common packs. The brown, black and white card back shown below was taken from a cover that N.A. Cobb proposed for a journal of nematology. Each template is made up of 5 layers for images and 6 layers for text.

Our plan is to print Nematode Trading Cards Pack number two and give it to the attendees of the 57th Annual Meeting of the Society of Nematologists in Albuquerque, New Mexico in 2018. You can submit as many cards to the competition that you want. The best 52 cards will be selected for the second deck. The card for Wilfrida Decraemer was presented to her on the occasion of her retirement from the University of Ghent. Hopefully it will be accepted for printing in the second deck. The first deck was distributed to the attendees of the 56th Annual Meeting of the Society of Nematologists in Colonial Williamsburg, VA.

Please download the templates and start making your cards for submission for the second pack. The deadline for submitting cards is May 30, 2018. If your card is selected, you will receive a free pack of cards. If you have any questions on how to use the templates, please feel free to contact Jon Eisenback (jon@vt.edu).

Society of Nematologists New Mexico in 2018. You many cards to the compe-want. The best 52 cards will be selected for the second deck.

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Dear Nematology Newsletter Readers and SON members:

Two items are listed for your consideration. Since we know that students are the future of our discipline, please consider supporting the Nathan A. Cobb Nematology Foundation: [http://www.crec.ifas.ufl.edu/societies/nacobb/projects.shtml](http://www.crec.ifas.ufl.edu/societies/nacobb/projects.shtml). This foundation's primary purpose is to raise money to provide travel for students to scientific meetings.

You will soon receive a reminder to pay your 2018 dues for the Society of Nematologists. To continue to be a member in good standing, please pay your dues before January 1, 2018. Also, please make a generous contribution to the Nathan A. Cobb Nematology Foundation with your tax-deductible support to the Foundation when you renew your SON membership at [http://nematologists.org/products/](http://nematologists.org/products/).

Jon Eisenback and Paulo Vieira, Editors

*Nematology Newsletter*

Please submit your contributions to the *Nematology Newsletter* at the following email address: nematology.newsletter@gmail.com

Most of the photographs contained in this newsletter are available for download as high resolution images at the following URL: [https://www.dropbox.com/sh/u0uye3m34va8yuf/AAA-o9FKj3SoK9mvZuyu7ea?dl=0](https://www.dropbox.com/sh/u0uye3m34va8yuf/AAA-o9FKj3SoK9mvZuyu7ea?dl=0).

(RKN on left and bottom, SCN on right and top)

This high resolution mosaic photomicrograph of adult males and second-stage juveniles of root-knot and cyst nematodes is a free resource from the Nematology Newsletter and the Society of Nematologists. You are welcome to download a full high resolution version of this photograph from the NNL Dropbox website.

Please credit J. D. Eisenback if you want to use it on a website or in a publication.

https://www.dropbox.com/s/p8wiqxs11fxd03lj/Root-knot%20vs%20Cyst.tif?dl=0
THE EELWORM DISEASE of wheat, long known in Europe, has been found during the past year causing considerable damage in Virginia and in isolated localities in West Virginia, Maryland, Georgia, and California.

Every effort should be made to control the trouble in these infested regions, to prevent its further spread, and to find other localities where the disease may exist.

The disease may be recognized on young and old plants and in the thrashed wheat by the descriptions given in this bulletin.

The trouble may be controlled by the use of clean seed, by crop rotation, and by sanitation.

If clean seed can not be procured from uninfested localities, diseased seed can be made safe for planting by the salt-brine treatment here described.
A SERIOUS DISEASE of wheat, long known in Europe and caused by a nematode, or eelworm, has been found during the past year causing a great deal of damage in certain parts of the United States, particularly in Virginia. Fortunately, the trouble can be controlled by measures which are described in this bulletin.

DESCRIPTION OF THE DISEASE.

The disease is usually brought to notice by its effects on wheat heads in the field, although it may occur on all parts of the plant above ground. Young plants a few inches high affected with the trouble can usually be readily recognized by a decided wrinkling, rolling, and distortion of the upper leaves. Such plants may die or may remain alive and produce dwarfed, diseased heads. These heads ordinarily stay green longer—that is, ripen later—and are smaller than those not affected, and the chaff is likely to open out at a wider angle than that of the good heads. In place of the expected good grains of wheat the head bears dark, hard galls, shorter and somewhat thicker than wheat grains, and, since the chaff spreads open, these can often be plainly seen in the affected spikelets before threshing. A badly diseased head in which the spread-out chaff exposes the galls is shown in figure 1. As these galls bear a resemblance to cockle, the seed of a common grainfield weed, farmers have mistakenly applied the name "cockle" to these galls, and "cockle wheat" is a common term for this disease in the threshed grain. Sometimes it has been mistaken for bunt, or stinking smut, a disease caused by a fungus related to the common loose smuts of corn and small grains. It has also been confused with bin-burnt wheat, caused by overheating in storage. A careful examination of these different troubles, as illustrated in figures 2, 3, 4, 5, and 6, will show that this nematode disease is entirely distinct from them.

CAUSE OF THE DISEASE.

Within these wheat galls are thousands of living but motionless young nematodes, as brought out in figure 7, which shows a section through a gall. These young nematodes are called larvae and can be barely seen as short, threadlike fibers when placed in water. In the winter the larvae soon begin active movement. These larvae are shown, greatly enlarged, in figure 8. In the winter or spring these young eelworms escape into the soil from galls which have fallen to the ground or which were planted along with the wheat seed. With an eel-like movement they reach the young seedling, finally become located between the leaf sheaths near the bud, and as the plant grows are gradually carried up to the heads. There they enter the young flowers and produce the galls. Within these they grow to maturity and lay eggs, which give rise to larvae. In this way their life cycle is completed. At the maturity of the plant the larvae become dried out and motionless, in which condition they can remain alive for many years.

DISTRIBUTION AND IMPORTANCE.

In the United States the disease was first reported to occur to a slight extent in 1909 in California, New York, West Virginia, and Georgia. After that time nothing is known about the occurrence of the trouble until 1917, when it was located at one place in Virginia, and since then it has been found at many points in the same State; also in West Virginia, Maryland, and Georgia, and in one locality in California. Samples of wheat mixed with the nematode galls collected at Virginia mills last winter indicate that the disease caused a damage of more than 25 per cent in some fields last season. In
certain fields in Virginia recent examination of the 1918 crop showed as much as a 40 per cent loss by actual count.

Although the present known distribution of the trouble is comparatively limited, it seems highly probable that it has been spread to other wheat-growing regions in the interchange of seed and along with importations of seed from foreign countries, in many of which the disease is widespread. Very likely the trouble occurs even to a considerable extent in many States and has been either overlooked or mistaken for bunt, cockle seed, or bin-burnt wheat. An examination of wheat before or after threshing should yield valuable information on this point. Samples of wheat or grain thought to be affected with this disease should be sent for positive identification to the agricultural experiment station of the State in which the disease is found or to the Office of Cereal Investigations, United States Department of Agriculture, Washington, D.C.

**CONTROL OF THE DISEASE.**

As the disease is not native to the United States, every effort should be made to prevent its further spread within this country, to stamp it out in localities already infested, and to stop its further introduction from foreign countries. It may be controlled by the measures suggested later.
THE EELWORM DISEASE OF WHEAT AND ITS CONTROL.

Fig. 7.—Reproduction from a photograph, taken through a microscope, of a thin cross section of an eelworm gall. The section is magnified about 35 times and shows a thick wall of cells surrounding the almost colorless mass of threadlike eelworm larvae in the center. Under favorable moisture and temperature conditions in the field these larvae escape from the gall into the soil and attack the young wheat plants. In figure 8 some of the active larvae are shown greatly enlarged.

Fig. 8.—Reproduction from a photograph, taken through a microscope, showing a number of the minute eelworm larvae barely one twenty-fifth of an inch long which have been taken from a gall and placed in a drop of water. They are here shown enlarged about 50 times. The worms move actively with an edd-like motion, and for this reason are called eelworms.

CLEAN SEED.

Secure, when possible, clean, sound seed from fields in which the disease does not occur and which therefore is free from the nematode galls.

HOW TO CLEAN DISEASED SEED.

If disease-free seed cannot be obtained from uninfested localities, the galls may be separated from the wheat kernels by the so-called salt-brine method devised by Dr. A. G. Johnson, of Wisconsin, for removing ergot from rye. Essentially it is as follows:

First, make up a 20 per cent salt solution by dissolving 40 pounds of common salt in 25 gallons of water. Then pour the diseased
seed slowly into this solution, stirring vigorously at the same time. The sound wheat kernels will sink, while the nematode galls, light kernels, and trash will float. The galls and other floating material may be skinned off and put aside and used as mentioned later. The result of cleaning a badly diseased sample of wheat by the above method is shown in figures 9 and 10.

After all the galls have been carefully skinned off, drain away the salt solution, which may be used repeatedly, and rinse the grain in water at once. Then spread out on the floor or a canvas to dry. Hasten the drying by stirring occasionally. The wheat is then ready for planting.

PRECAUTIONS.

Always rinse the sound seed promptly after treatment. This makes it dry better and prevents injury to germination.

Fig. 10.—Wheat before and after treatment. In the large jar (A) is shown a 2-ounce sample of wheat from Virginia before treatment by the salt-brine method. Jars B, C, and D contain similar samples after being treated by the salt-brine method and separated into (B) sound, plump grains, (C) nematode galls, and (D) light shelled kernels, swelled grains, etc. The sample contains nearly as many nematode galls (93) as plump grains (1,362), but the former occupy only about one-third the space of the sound grains.

Care should be taken to avoid the freezing of the wet grain; likewise, special care should be taken to prevent stock and poultry from drinking the salt brine.

DISPOSAL OF EELWORM GALLS.

The skinned-off galls should never be thrown on the ground or scattered in any way so that they can get back on the land. These light kernels and other skinned-off material can safely be fed to poultry if first rinsed in water to remove the salt and then plunged into boiling water to kill the eelworms. When this is done there is no danger of the eelworms remaining alive or the poultry being injured. Whether or not the galls are fed to poultry, they should be plunged in hot water before being thrown out anywhere.

CROP ROTATION.

Land on which nematode-infected wheat has been grown should be planted to other crops for two or, better still, three years. During this time the nematode will be so starved out that a subsequent wheat crop grown from clean seed will be free from the trouble or practically so. Any crop may be used in the rotation, since only wheat is known to be seriously attacked by the disease.

SANITATION.

Care should be taken to prevent the spread of the nematode from one field to another by means of infested soil which may cling to the feet of men or animals, or to various kinds of farm implements. Surface waters, which may carry galls or the free nematodes, should not be permitted to pass from infested soils to uninfested areas. A deep plowing under of the stubble just after harvest lessens the spread of the disease either to near-by fields or within the same field.