# Mississippi State University Notice of Proposed Sole Source Purchase

# 189-07

Mississippi State University anticipates purchasing the item(s) listed below as a sole source purchase. Anyone objecting to this purchase shall follow the procedures outlined below.

1. Commodity or commodities to be purchased (make, model, description):

LI-COR Biosciences LI-6800F Portable Photosynthesis System with Fluorometer: a Gas Exchange instrument for measuring photosynthesis, and respiration. The equipment has various customizable attributes and is able to get measurements from a variety of commodities and objects ranging from plants to cut flowers to oysters to insects.

1. Explanation of the need to be fulfilled by this item(s), how is it unique from all other options, and why it is the only one that can meet the specific needs of the department:

The Mississippi State University Coastal Research and Extension Center is in need of a user-friendly, portable, up-to-date system to collect, evaluate, and manage data on biological processes such as photosynthesis and respiration.

A photosynthesis measurement that is a combination of gas exchange and fluorescence analyses together provides unique information about plant growth and crop productivity under biotic and abiotic stresses. Considering recent climate changes, chlorophyll fluorescence measurement is a very powerful tool in agricultural, environmental, and ecological studies. The main advantage of new photosynthesis meter machines like Li-Cor 6800 is that it is a non-destructive tool and allows researcher to get information on the photosynthetic process without destroying the tested sample. The ability to control the chamber conditions when taking these measurements will aid in having precise measurements every time, by eliminating contamination from other independent variables. For example, the chamber pressure will need to be controlled to prevent gas flow leaks, humidity will need to be controlled in order to prevent unwanted effects on the leaf, and the ability to get measurements at both low and high carbon dioxide levels will provide more accurate measurement of photosynthesis metabolism. In plant physiology studies, Li-Cor 6800 is a reliable tool to evaluate the responses of photosynthesis to water, temperature, and light stresses. In agriculture, to conduct the effective evaluation of crop growth and performance on new genetically modified plants, we need a rapid and non-invasive tools like Li-Cor 6800. Increasing popularity of LED lights in horticulture, Li-Cor 6800 is a powerful tool to test performance of LEDs with different wavelengths and light intensities on quality and productivity of specialty crops.

An example of our current research in need of the Li-Cor 6800 is looking at determining root initiation using physiological leaf changes visible with hyperspectral imagery. The addition of the Li-Cor 6800 will provide the ability to calculate photosynthetic data and allow us to correlate these levels with the data collected from the hyperspectral imagery. This will let us see if the photosynthetic trend when root initiation occurs follow the same trend as the physiological leaf changes helping to strengthen our data results.

Another example is research being done on irradiation of cut flowers as a way to extend vase life. The capability of this Li-Cor system to measure respiration would help provide a possible explanation for why the irradiation of cut flowers extends their vase life, adding a great value to the research.

The LI-COR Biosciences group in Lincoln, Nebraska developed the LI-6800 Portable Photosynthesis System based off their popular LI-6400 Portable Photosynthesis System with some new adjustments that improved the usability of it. It can complete a survey measurement in under a minute, with batteries that last all day. A large touchscreen display shows informative, full color plots that help you track the progress of each measurement. On-screen messages alert you to issues so you can collect consistent, high quality data. Training is simple with the LI-6800 whereas with the LI-6400 it took weeks to train and teach new users how to configure, troubleshoot, and use the instrument. The company also offers training courses free of charge so the experts can teach you how to use and get the most out of their machines. This instrument was announced on March 28, 2016 and is the only instrument to my knowledge that provides all the essential functions listed above.

The two most similar instruments are the Walz 3000 (http://www.walz.com/products/gas\_exchange/gfs-3000/introduction.html) and ADC BioScientific iFL(http://www.adc.co.uk/products/ifl-integrated-fluorometer-gas-exchange-system/). Both of these instruments are unable to provide all the capabilities described above and additional equipment would need to be purchased in order to bring them up to spec with the LI-6800.

1. Name of company/individual selling the item and why that source is the only possible source that can provide the required item(s):

LI-COR Biosciences  
4647 Superior Street  
PO Box 4425  
Lincoln, Nebraska 68504

The LI-6800 is the only instrument with superior water vapor control that can humidify or dry the air stream independently of the gas flow rate. This requirement is particularly important for the hot, humid climate as we experience in Mississippi. The LI-6800 also features a larger chamber aperture (9-cm2, 6-cm2 for fluorometer) to maximize signal-to-noise ratio by sampling a larger leaf area. LI-COR Biosciences is the only known source for this type instrument system that has the required speed and stable feedback control of C02 and H20 at the leaf as a result of the unique fast response C02 and H20 Infra-Red Gas Analyzers (IRGA) built into the mixing volume of the leaf cuvette. Our research requires an instrument of this design so measurements can be confounded by gas concentration changes at the leaf. Li-Cor Biosciences is the sole source of this type of photosynthesis system that can satisfy all of the above criteria and that satisfy the requirements of our research.

These two documents also provide more spec details that can be used for justification as to why LI-6800 is the only possible system that can provide what we need

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#2 [https://licor.box.com/s/acnwd8bu4hpjozzci0usdplob8qbk39m](https://licor.box.com/s/acnwd8bu4hpjozzci0usdplob8qbk39m#_blank)

1. Estimated cost of item(s) and an explanation why the amount to be expended is considered reasonable:

The overall cost of the system including discount and shipping and handling is $49,062. There are no additional fees or annual license renewals associated with this system. This also includes training for two operators at LI-COR Biosciences in Lincoln, NE valued at $5,400 for free either upon purchase of system or before purchase of system.

This total amount is within range of the other comparable systems especially since the training provided in the United State is contingent on purchase of the machine first, otherwise international travel is required to attend training sessions. A tariff will also be applied, in addition to shipping costs, to these machines as they are being made and shipped from overseas and not made and shipped within the United States.

1. Explanation of the efforts taken by the department to determine this is the only source and the efforts used to obtain the best possible price:

Based upon the recommendation and use of the LI-6800 systems in different departments within the university, a Research Associate at the Coastal R&E participated in the LI-6800 training in Lincoln, NE. She found the system to be easily operated, with highly responsive, customizable chambers and controls allowing for faster, more accurate measurements. In the past, measurements at the Coastal R&E have been taken on a borrowed USDA LI-6400; by staying with the LI-COR system comparison of data points from one LI-COR system to another can easily be applied, whereas the introduction of a new machine and system could render old data from the LI-6400 unusable and incompatible with the new system. This will also make sharing data with different researchers in the university who also are currently using a LI-6800 easier as well. Also, other researchers, such as Dr. Daryl Chastain, in the university who also have a LI-6800 can assist with troubleshooting and configuration of the machine if needed and have also offered to share their machines when environmental conditions merit additional capacity and volume of data collected would enhance statistical robustness.

Any person or entity that objects and proposes that the commodity listed is not sole source and can be provided by another person or entity shall submit a written notice to:

Don Buffum, CPPO

Director of Procurement & Contracts [dbuffum@procurement.msstate.edu](mailto:dbuffum@procurement.msstate.edu)

**Subject Line must read “Sole Source Objection”**

The notice shall contain a detailed explanation of why the commodity is not a sole source procurement. Appropriate documentation shall also be submitted if applicable.

If after a review of the submitted notice and documents, MSU determines that the commodity in the proposed sole source request can be provided by another person or entity, then MSU will withdraw the sole source request publication from the procurement portal website and submit the procurement of the commodity to an advertised competitive bid or selection process.

If MSU determines after review that there is only one (1) source for the required commodity, then MSU will appeal to the Public Procurement Review Board. MSU will have the burden of proving that the commodity is only provided by one (1) source.

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