

**SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION:
QUESTIONS FOR THE RECORD**

**HEARING ON
UNMANNED AIRCRAFT SYSTEMS: KEY CONSIDERATIONS REGARDING SAFETY, INNOVATION,
ECONOMIC IMPACT, AND PRIVACY
TUESDAY, MARCH 24, 2015**

**Questions for Mr. Jeff VanderWerff, VWO, LLC., representing the American Farm
Bureau Federation**

From Chairman Thune

- 1. Even with all of the challenges associated with safe integration of unmanned aircraft, as highlighted by some of the other witnesses at the table, do the potential economic impacts outweigh the drawbacks in the agriculture community? How do the potential benefits of UAS reach beyond the borders of your farm land and impact the overall economy?**

Answer. There is no denying the economic boon that UAS will bring once their potential can be fully realized. A study conducted by the Association for Unmanned Vehicle Systems International (AUVSI) found that the UAS industry will create more than 70,000 new jobs in the first three years after they are allowed to fly in U.S. airspace, and over 100,000 new jobs by 2025. The resultant economic impact will total over \$13.6 billion in the first three years and is predicted to grow to over \$82.1 billion by 2025.

The AUVSI study concluded that the commercial agriculture market will dwarf all other industry segments with its economic impact. During the 11-year period 2015-2025, UAS integration is expected to contribute \$75.6 billion in economic impact by agriculture, compared to \$3.2 billion by public safety and \$3.2 billion by other activities.

Farmers will reap benefits from UAS through their ability to perform important, time saving functions that support everyday farming and ranching activities. Equipped with sophisticated cameras and/or sensors tailored to the unique specifications and needs of the user, UAS can help farmers and ranchers scout and monitor crops and pastures more efficiently by capturing accurate, high-resolution images covering up to hundreds of acres in a single mission. The imagery and data gleaned from a UAS can assist in identifying the particular location where a specific treatment – be it fertilizer, water, pesticides or herbicides – is necessary. It allows the spot-treatment of sections of fields and pastures as opposed to watering or spraying the entire field. It allows ranchers to check on livestock on range lands and pastures. By doing this, the producer not only lowers the cost of treatment but also lowers the environmental impact.

The value of spot-treatment is exemplified during droughts. Agriculture is a water-dependent industry. Whether they are growing plants or raising animals, farmers and ranchers need water. It is no secret that the past few years have been especially difficult for farmers in Western states, particularly in California, where historically low rainfall has created an emergent crisis with no end in sight. In fact, the drought is so severe that the governor of California earlier this month introduced the first mandatory water restrictions in the state's history. Although no technology could completely counterbalance effects of this magnitude, deploying UAS above affected fields in California and elsewhere in the Western U.S. could help minimize the amount of water used. Rather than apply an inch of water on a blanket basis, for example, a UAS could quickly scan the field to more precisely identify the areas most in need of treatment.

- 2. With an expanded use of UAS in agriculture it seems that farmers could have two options: either they will own and operate their own UAS, or they will hire someone that specializes in UAS services for a fee. Which do you expect to be the more popular option? Why?**

Answer. These will be the two options available for farmers who want to utilize UAS on their farms. Determining which option is more popular takes into account a variety of variables this includes individual preference. While I cannot make a prediction on which option will be more popular, one variable will be influential for all farmers and ranchers, return on investment. Depending on which option provides the greatest return on investment for that farmer's specific circumstance will impact the decision. As with all business decision the return on investment is a critical component.

- 3. Which option would you use for your farming operation?**

Answer. While we will certainly evaluate both options, we feel that based on where the technology is headed, and the potential for drone pesticide application, we will own and operate our own UAVs. I would suspect, however, that there will be significant interest among farmers who simply wish to contract for this service.

- 4. Who will or should own the data if a farmer hires another company to provide UAS services – the UAS company or the farmer/client? What are some of the potential drawbacks with regard to each approach?**

Answer. AFBF supports UAS technology and the enormous potential it brings to farming. But it is critical that the data remain under the ownership and control of the farmer and is not available to government agencies or others without express permission.

Privacy is a serious issue for farmers. They should be able to use and enjoy their own property for personal and business purposes without unwarranted intrusions either by the government or private actors. Nor should any unauthorized parties be permitted to aggregate, use and/or retain data collected from a farm or ranch without the express

permission of the farmer or rancher. Absent a strong set of principles to deter such behavior, an activist group opposed to a common and permissible farming practice, such as pesticide usage, could deploy a UAS over a field to obtain information that could be used as part of a slanted campaign to discredit the farm and or lead to an unwarranted lawsuit that the farmer must spend resources to defend.

In addition, farmers and ranchers are concerned about data privacy. For example, a farmer's crop information may be valuable to suppliers and other companies for contract purposes and for many other reasons. A framework must be established – preferably through industry action - to protect farmers' data from unauthorized access by both government agencies and private actors. Any violations of that framework must trigger serious consequences and provide protections for the land owner/operator.

- 5. In your testimony you highlight a number of attractive uses for UAS among growers and ranchers, particularly relating to the precise information they can provide. Are there other applications that may be of use to agriculture? For example, do you think UAS will replace conventional spraying methods (both land and air tractors) in the near future?**

Answer. In your testimony you highlight a number of attractive uses for UAS among growers and ranchers, particularly relating to the precise information they can provide. Are there other applications that may be of use to agriculture? For example, do you think UAS will replace conventional spraying methods (both land and air tractors) in the near future?

Answer. The Federal Aviation Administration (FAA) is currently reviewing the comments on a proposed rule for the “Operation and Certification of Small Unmanned Aircraft Systems.” This specific rule is for UAS weighing less than 55 pounds. AFBF did submit comments to the FAA.

Since the proposed rule is only for small UAS, the applications of UAS within the agricultural community are currently focused on imagery and surveillance. However, projecting the future of UAS precision agriculture operations in this country does not require the stretch of imagination. Other countries like Australia, Canada, the United Kingdom, France and Japan are already benefiting from UAS flights. Japan and Australia, in particular, are surpassing the U.S. with respect to UAS in agriculture: Farmers in those countries have been safely flying UAS to apply pesticides and fertilizer to their crops for more than 20 years.

- 6. What can Congress do now to help the FAA and other stakeholders facilitate the integration of UAS in a safe and secure manner?**

Answer. Providing flexibility by instituting regulations and legislation through a genuine performance-based standard. A final rule that may take 18-24 months to finalize cannot be based solely on the snapshot of UAS technology as it exists today. Farms are tailor-made for application of performance-based UAS standards; with

their privately owned, contiguous and sparsely populated fields, they offer a natural setting to conduct UAS operations without adversely affecting safety. Instead of prohibiting operations such as those that are conducted over non-participating persons, at night, and beyond visual line of sight, performance-based standards should be used to authorize such operations in circumstances where it is demonstrated that the UAS can be operated safely. Any legislation or regulation should be flexible and forward looking, rather than excessively prescriptive and cemented in time.

From Senator Wicker

- 1. Unmanned Aerial System (UAS) Center of Excellence. Would you agree that the Center of Excellence can serve an important role by providing objective research for FAA consideration?**

Answer. AFBF supports the FAA using the Center of Excellence in addition to other public or private entities that promote research and development for UAS.

- 2. Is beyond line of sight operations needed for agricultural uses? If so, at what altitudes?**

Answer. Yes, beyond visual line of sight (BVLOS) is needed for agricultural purposes. While some farms only consist of several acres and could be fully surveyed within-visual line of sight, many more farms do not fit this description. For these larger farms, in particular, the importance of being able to conduct BVLOS operations is magnified. Owners and operators of large farms need to survey huge plots of land to protect their crops from threats. If farmers and ranchers are restricted to visual line of sight requirements then farmers and ranchers with large acreage would need to fly multiple, potentially redundant missions to cover the necessary ground. Instead of capturing the imagery and collecting the relevant data all at once, these farmers would be forced to expend precious additional resources into stitching together maps and synthesizing data. This would be highly inefficient – both in terms of manpower and time – and could nullify the potential time and cost savings that make UAS so attractive with little corresponding safety benefit.

In addition, a BVLOS prohibition is redundant in the agricultural context when considering the safety mechanisms already available and installed on many UAS, especially when combined with the remote, uncongested airspace over most farms. UAS can be controlled via proven operational safeguards such as geofencing, visual observers, flight termination mechanisms, and others that either exist now or will in a short time frame. AFBF also supports the use of risk mitigation procedures to notify manned aircraft that an UAS is operating in the vicinity. But imposing a blanket BVLOS prohibition given the availability of recognized risk mitigation measures and rapidly developing UAS technology is unnecessarily prescriptive, particularly in the open environment of a farm where the chances of UAS harming general aircraft or persons on the ground are significantly reduced.

Given the remoteness of most farms and the uncongested airspace over them, there is no reason why the 500 foot ceiling, as proposed in the Federal Aviation

Administration's proposed rule, could not be lifted under certain circumstances. For example, such operations could be limited to certain times and classes of airspace and subject to the operator obtaining a certificate of waiver or authorization.