I was the first farmer in the US to use a drone

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Top left: My grandfather Reinhard Wilken plowing with horses in the 1920s, Top right: Cletrac with a bean cultivator on front in the1930s, Middle right: My mother Marga Wilken Blair on a Farmall M cultivating beans in the 1950s, Bottom right: Robert Blair on a Case 2470 disking pea ground in the 1970s, Bottom left: Dillon Blair harrowing stubble ground with a John Deere 8520T in 2010, Middle: My son Logan Blair with a hexacopter in 2013. Image from Robert Blair.

Image from Robert Blair

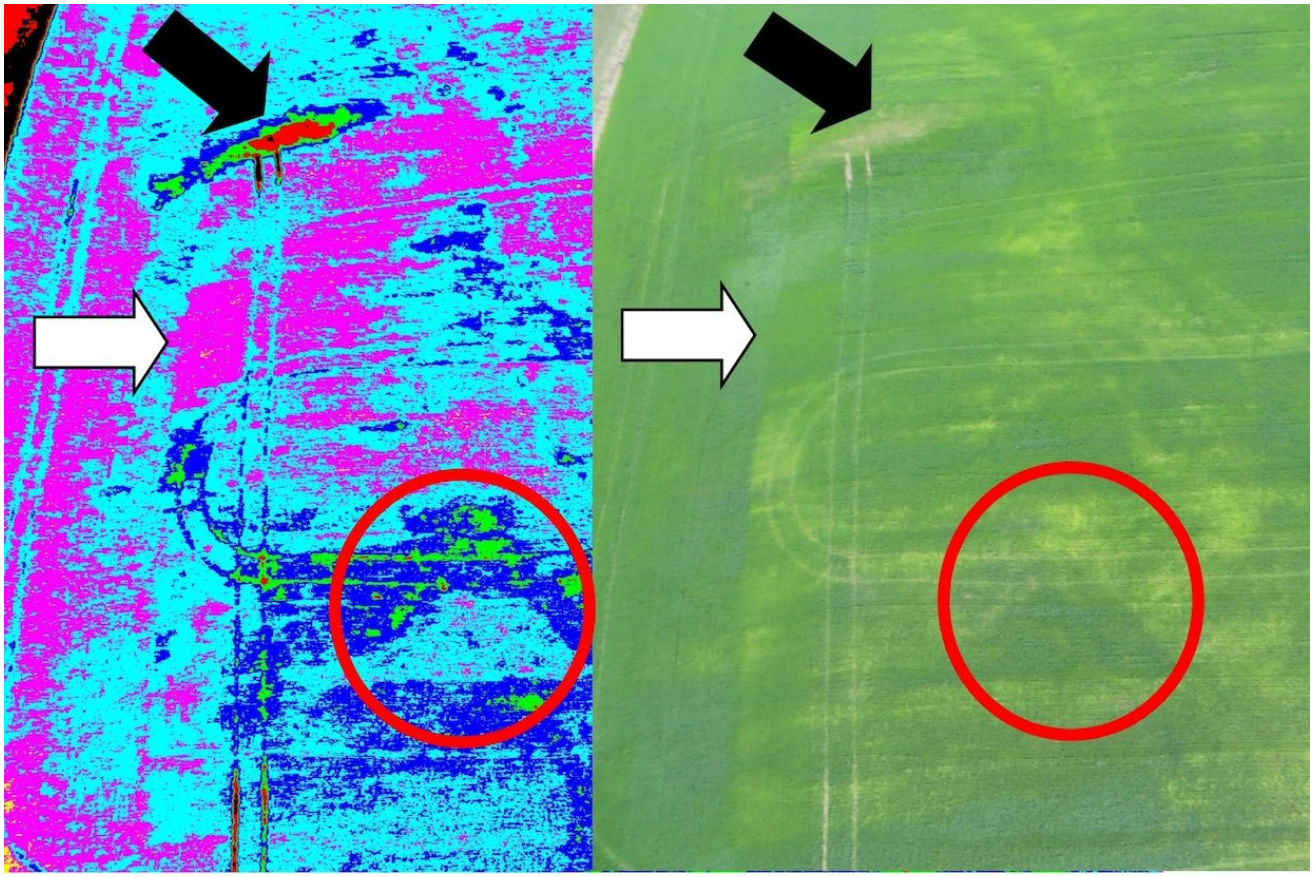
There are very few points in time when a person can help influence the future of an industry they love. Agriculture is my industry. Technology advancements such as John Deere's plow, McCormick's reaper, Eli Whitney's cotton gin from the industrial revolution, and Norman Borlaug's breeding techniques that started the green revolution, are the foundation of today's agriculture.

Today we are in the information age and Unmanned Air Systems (UAS) are another such advancement that can positively impact agriculture. The ability to capture information to help farmers and ranchers better understand their operations to make more informed management decisions is a reality.

Our farm was founded in 1903, the same year the Wright Brothers had the first successful powered flight. One hundred years later I have tractors that drive themselves, the capability to properly apply inputs to specific areas, and eyes in the sky to assist in monitoring the crops during the growing system. As the old advertisement stated, "We've come a long way baby."

My precision agriculture journey began in 2003 by using a PDA (handeld digital device) with a wire connected to a

small GPS receiver to do simple mapping. Now we use our smart phones with built in GPS and apps that are way more complex, user friendly, and functional to not only gather data but to control irrigation systems remotely.



This has two pictures of the same thing; the one on the right is the original RGB image and the one on the left has had false color added to it to stand out. The white arrows are the same areas in each picture and point to a 45 foot wide block where the fertilizer machine was turned on/turned off properly. I used this for management/instruction purposes. The black arrows point to a steep area that is very shallow, rocky ground that doesn't produce well no matter what management is done to it. The red circle shows an area where the dark green in the RGB corresponds to the light blue where nitrogen levels were good coming out of winter. The green, red, and dark blue in the image on the left corresponds with the yellow, light green, and brownish color on the right image where more nitrogen is needed.

Image from Robert Blair

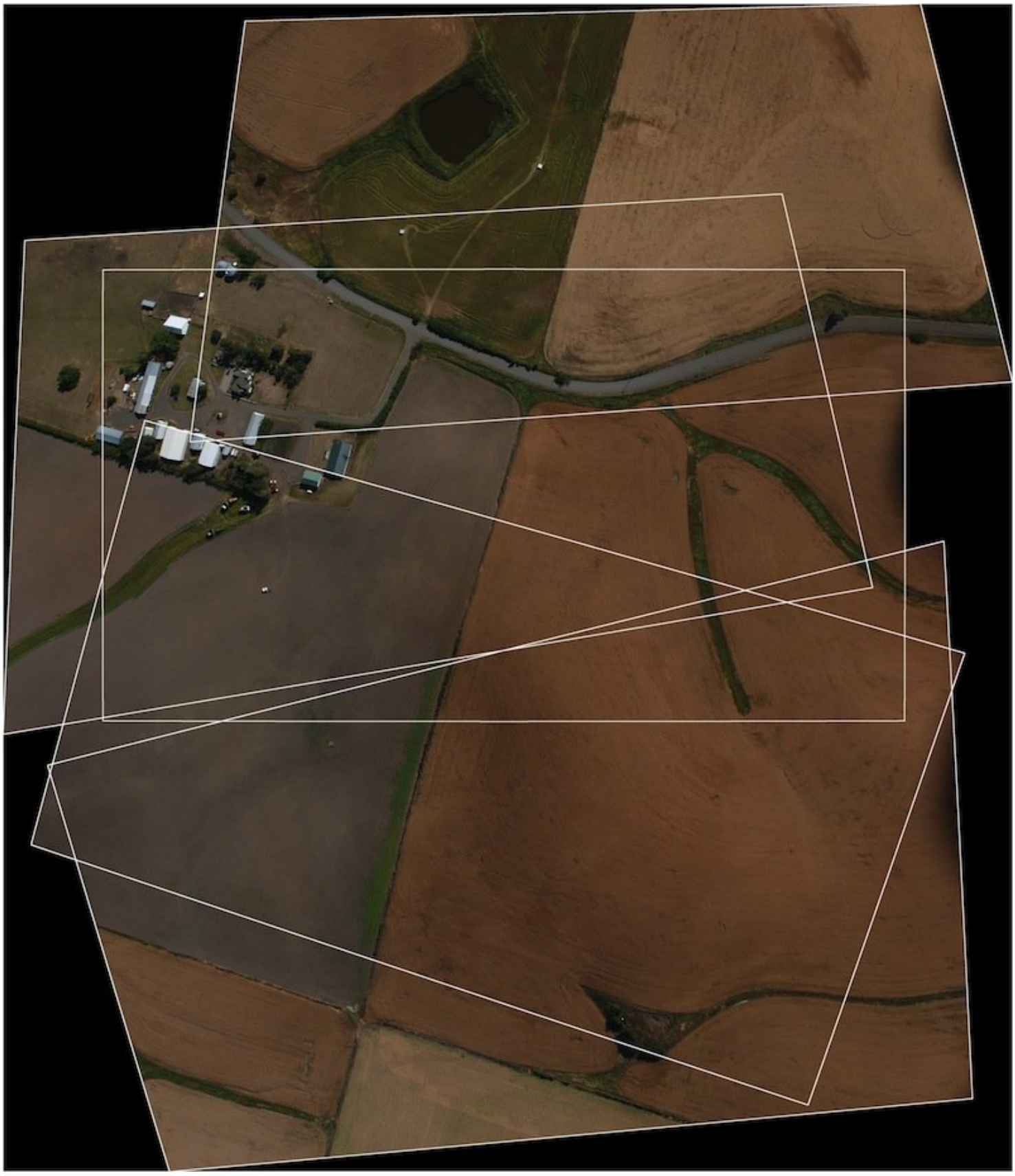


Image from Robert Blair

In 2004 I put a yield monitor onto the combine. It's made up of a computer in the cab with different sensors situated in and around the machine to collect elevation, temperature, crop moisture, on-the-go yield, etc. This is great information, but it is reactive data. That means the crop has matured to be harvested and there is nothing more I

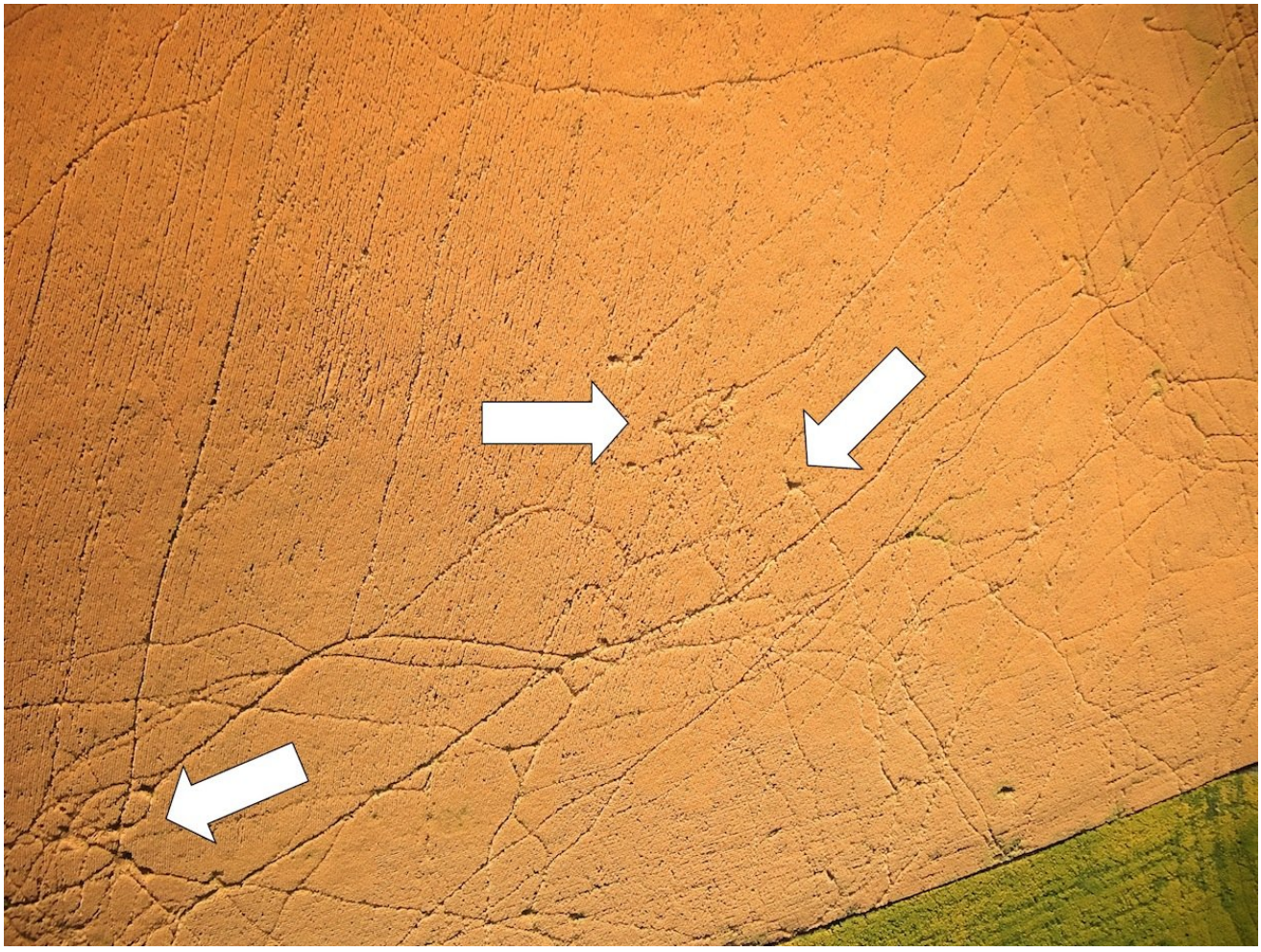
can do to affect the outcome of the growing season.

I took precision agriculture to new heights in 2006 by becoming the first farmer in the US to own and use a UAS. Just like my early precision ag journey, there were many rocky roads to traverse and lessons to be learned. It's tough being on the "bleeding" edge of industry.

With the advancements of UAS and other agriculture technology we have surpassed precision agriculture and are now in the early stages of surgical agriculture. What I mean is, through advancements in technology we can do an even better job of managing our soils, crops, and other resources to more precise levels.

> *To be as good as our fathers we must be better, imitation is not discipleship.*

~ Wendell Phillips



Elk Damage in Peas – The arrows point to depression in the peas where elk laid down. You can also see the trails going all direction through the crop along with the seed rows of peas.

Image from Robert Blair

UAS change the game drastically. They can collect data throughout the growing season so management decision can be made on when to water (I am a dryland farmer and rely strictly on rain), fertilizer needs in certain areas, weed problems that need to be treated, or other anomalies that show up. The best part is that I now have coordinates to physically check targeted areas, and this makes better use of my time.

However, a UAS is only as good as the other precision ag equipment on the farm. If there are no computers on the tractors or controllers on the equipment, the UAS data collected is just good general information with no directed purpose…pretty pictures. Also, without the yield monitor, images taken during the growing season cannot be quantified to know how good our management strategy was.

I have used the data gathered by UAS for multiple things such as showing wildlife damage in crops, seeing how far the nutrients from cow manure travel from winter feeding areas, spotting pest areas, and for management lessons on operating equipment properly. Basically, I want to gather as much data as possible so when the time comes that new software and systems have been developed I have many years of historic data to show the path forward.

To be successful, agriculture and our urban cousins need to quit pointing fingers and work together. Farmers and ranchers are sustainable and we can use technology to not only prove it, but to make it better. But we need help from the business industry outside of our sandbox to create technologies and solutions centered on the vast agronomic knowledge farmers have gained from years of working and loving the land.

Me with a UAV I designed and built. It is five feet long, has a nine-foot wing span, and weighs roughly seven pounds with batteries and cameras.

Image from Robert Blair

UAS is a natural evolution in agriculture's story, and it can help our industry responsibly meet the tremendous challenge of feeding nine billion people by the year 2050. Farmland is being consumed by people to live on. Water use is becoming restricted. Resources are depleting. Precision Agriculture Technology and UAS will play a major role in agriculture being successful. But, we need help from outside our industry.

Oh, one more thing; farmers are young at heart and just big kids still playing in the dirt…only with bigger toys and now UAS!

– Robert Blair is a fourth generation farmer from north central Idaho managing 1,500 dryland acres of wheat, barley, peas, lentils, chickpeas, alfalfa, and cows. The farm is situated on the edge of the rolling hills of the Palouse and not far from his Alma Mater the University of Idaho where he received his B.S. in Agriculture Business. Robert is also the current president of the Idaho Grain Producers Association, past chairman of the National Association of Wheat Growers (NAWG) Research & Tech Committee, and chairman of the US Wheat/(NAWG) Joint Biotech Committee.

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