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ArcGIS as an Image Management Platform for Agriculture Applications

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DO YOU KNOW?

Q1. According to recent U.S. census data, which age group boasts the most farmers?

A. Under 45 years

B. 45 to 65 years

C. 65 years and older

Q2. Approximately what proportion of all land in the U.S. is farmland?

A. 40%

B. 45%

C. 50%

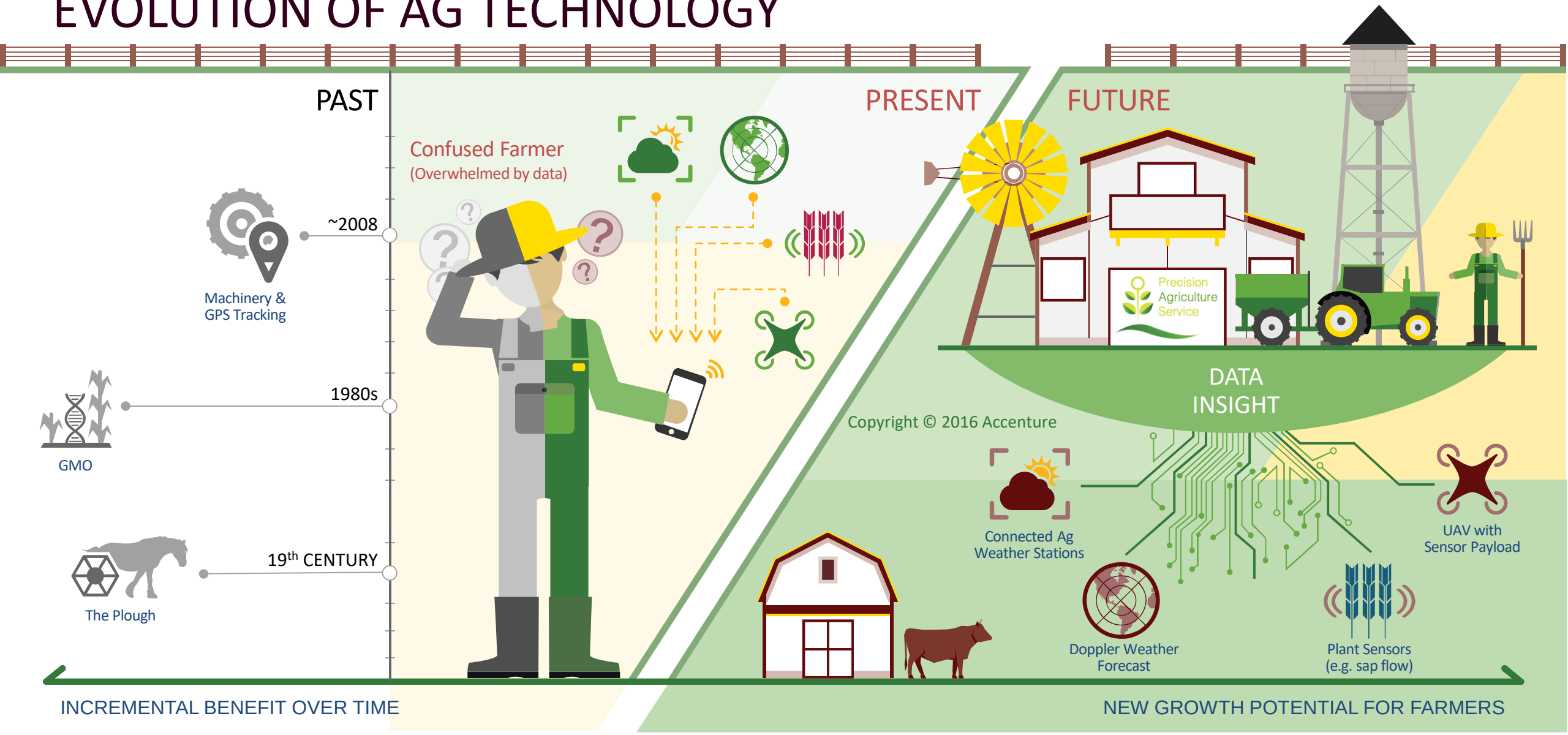
Q3. Adoption of imagery-based precision agriculture technologies by commercial U.S. farms is projected to grow in 2018 to over:

A. 20%

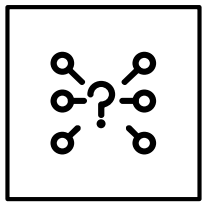
B. 35%

C. 50%

EVOLUTION OF AG TECHNOLOGY

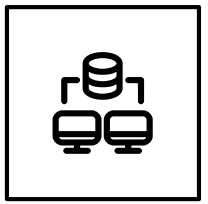


FACTORS DRIVING DIGITAL FARMING



Technology is Enabling New Data Sources at Manageable Cost

- Internet of Things
- Advanced Remote Sensors
- Satellite Imaging
- Drone Imaging
- Robots
- Digital Connectivity



Greater Data Storage and Processing Capabilities

- Process, Machine, Human data blending
- Structured/Unstructured data
- "Big data" architecture for storage and processing

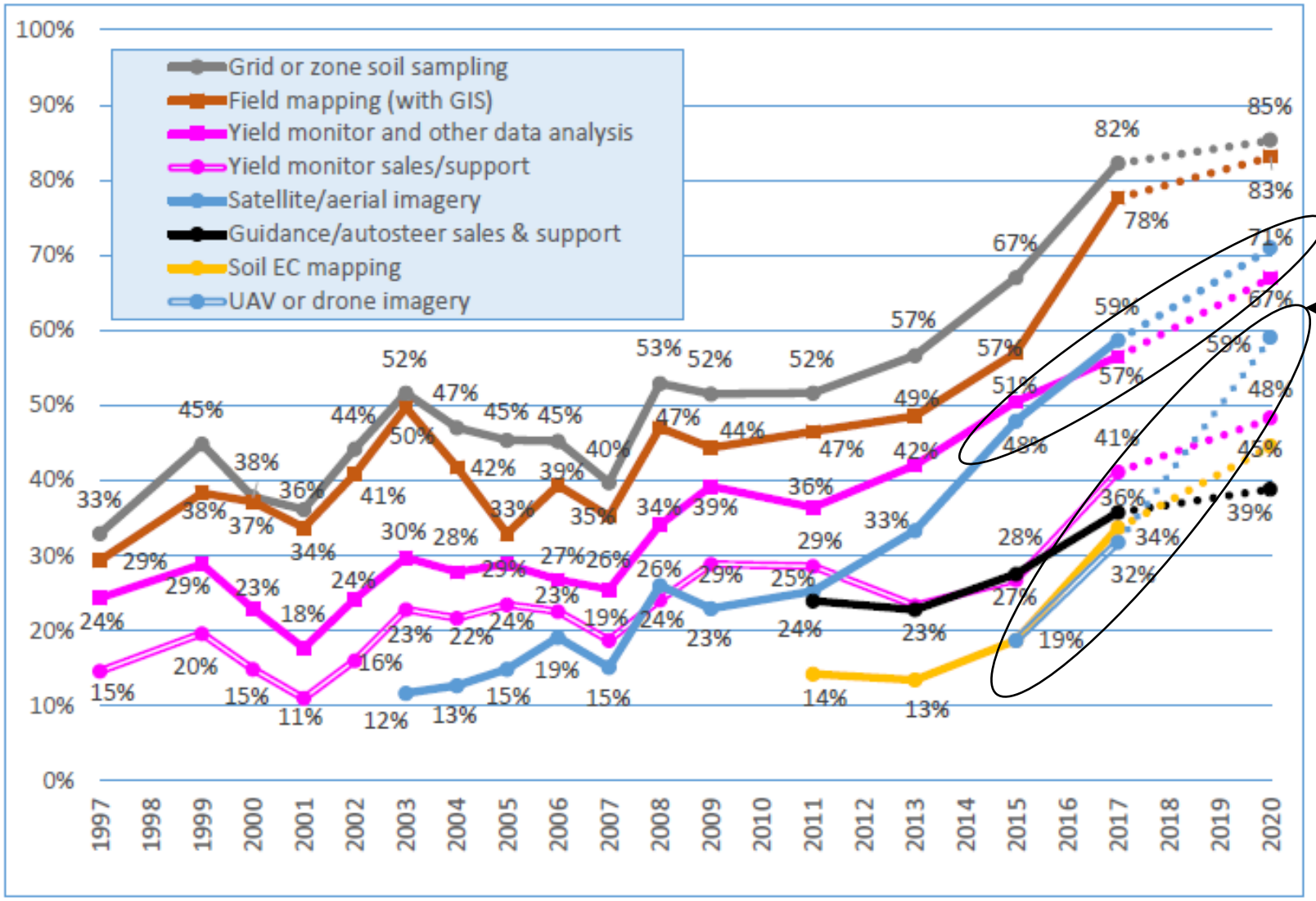
Emerging Approaches for Decision Support

- Mobile alerting and data capture
- Farm mgmt. systems
- Remote advisory services
- Pooled data for agronomy
- Predictive analytics

360 View of the Farm for Economic Impact Analysis

- Increase operating efficiencies
- Improve mgmt. control
- Respond to environment volatility
- Manage regulatory paperwork

ADOPTION OF PRECISION AG SERVICES AND SENSING OVER TIME



Satellite

UAV or Drone

Image Source: CropLife/Purdue Precision Dealer Survey, Purdue University Center for Food and Agricultural Business, Dec 2017 (link to full report here)

IMAGE PROCESSING CONSIDERATIONS IN AG APPLICATIONS

Business Need

- Ease of search and navigation
- Privacy and security
- Function within limited network bandwidth
- Short cycle time

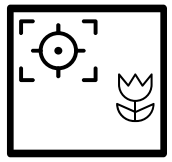


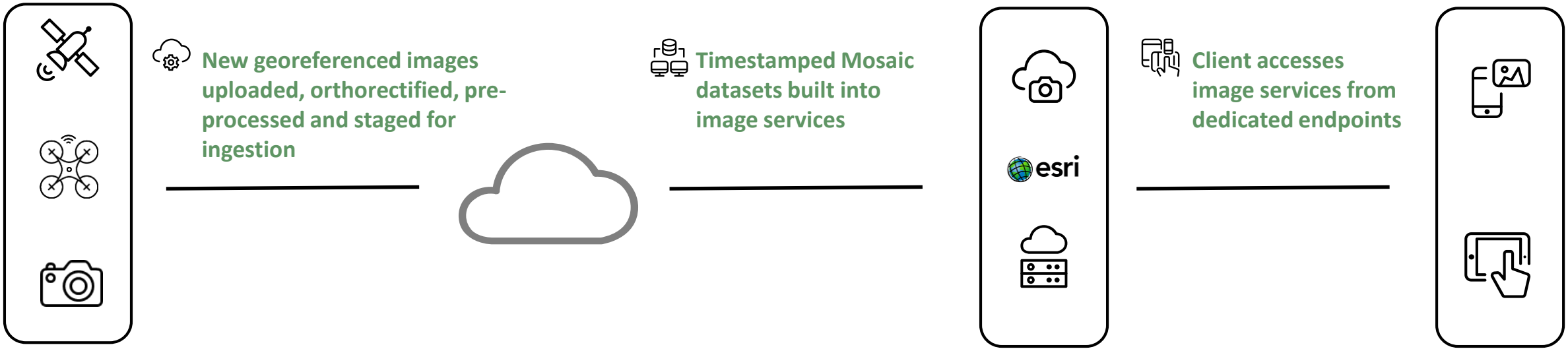
Image Capture

- Image resolution (GSD)
- Image spectral considerations
- Environmental conditions at time of capture
- Lighting normalization and orthorectification

Processing and Storage

- Geospatial and temporal metadata
- Data volume
- Storage Efficiency and Cost
- Access Efficiency

USING ARCGIS AS AN IMAGE PLATFORM



EXPERIENCE WITH ARCGIS TOOL SET

Strengths

- Mosaic Dataset works for Ag application geodatabases
- Flexible, Functional ArcGIS Server API
- Excellent documentation and support
- Works with GDAL processed rasters

Pitfalls

- Complexity of technical architecture and scripted building of Mosaic datasets due to ArcMap licensing restrictions
- Integration with cloud stored rasters
- Mosaic rasters preprocessing (statistics, pyramids, overviews)
- Building image service with referenced mosaic sets
- Getting time stamps on mosaic datasets to work
- Custom color NDVI maps not working as expected in 10.5

THANK YOU!

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For information about Accenture Digital Agriculture Service, please visit the following links:

- https://www.accenture.com/us-en/insight-accenture-digital-agriculture-solutions
- https://www.youtube.com/watch?v=D1B8gZR1q9I