

AAPSE Liaison notes, ASABE Application Systems Committee, Summer 2019

Introduction to ASABE Machinery Systems (MS)-23/6 (Application Systems)

American Society of Agricultural and Biological Engineers (ASABE) Machinery Systems (MS) Committee 23/6 handles most national and international Standards relating to agricultural and other exterior environmental spraying, production, maintenance, and use of sprayers, on behalf of the United States. Is the US representative for this to International Standards Organization (ISO).

The ASABE MS-23/6 Community includes approximately 85 members

There are five subcommittees that meet independent of the Main committee:

MS-23/6/1 Liquid application systems

MS23/6/2 Aerial applications

MS-23/6/3 granular application systems

MS23/6/4 agricultural spray modelling

MS23/6/5 anhydrous ammonia applications

Other relevant committees that work closely with 23/6:

MS-54 Precision agriculture technology

MS-60 Unmanned Aerial Vehicles (UAV)

Notes from the Most Recent ASABE meeting:

Our primary initiatives for 2019-2020 are, in equal order of importance:

- 1) Continuing to maintain the current load of standards review
- 2) Develop and improve the culture of the ASABE 23/6 community to improve the member experience and professional value of participation.
 - a. In so doing, attract a broad range of Application Community experts including Chemical industry, Academia, Extension, Regulatory, Large and Specialty manufacturing . This is critical to write current, relevant standards that are useful throughout the community.

- 3) Improve our outreach to other relevant community groups that have an interest in or benefit from application technology and standards.

Specific activities in relation to this include:

- 1) Members were encouraged to reach out to peers to invite participation.
- 2) Mark Ledebuhr plans to develop a mentoring procedure for new members.
- 3) Action: A survey will be developed late summer/fall 2019 and distributed to members to solicit member feedback on what would be most relevant for the committee to focus on moving forward.

Approximately 36 technical papers were presented in three sponsored sessions with researchers representing at least 6 countries.

Standards activity of note:

There was an ISO Meeting in Barcelona in mid June, about a dozen folks including myself from the US represented ASABE/ANSI. There is active development of a standard on **Closed Transfer Systems** and on **Unmanned Aerial system (drone) spray applications**. These discussions will continue in November in China.

There was discussion at the ASABE AIM meeting in Boston July 2019 regarding the desire for complimentary copies of ISO standards. National adoption of ISO standards would provide that to participating ASABE 23/6 members. MS-23/6 will begin the adoption of all Relevant ISO standards as US national standards at the 2020 AIM Meeting. This should significantly increase awareness and use of said standards.

A list of all national and international standards is included at the end of this report.

Subsequent Meetings

AETC 2020, February 10-12, Hyatt Regency, Louisville, KY,

AIM 2020, July 12-15, CHI Health Center Omaha, Omaha, NE

Proposed technical sessions for the Annual International Meeting in July 2020

- 1) Precision Agricultural Utilization in Chemical and Fertilizer Applications: MS-54, MS-6
- 2) Innovations applied to Chemical and Fertilizer Application: MS-54, MS-6
- 3) A full-day symposium of Spray modelling and other current topics TBD featuring invited speakers hosted by MS-23/6/4 on Sunday July 12 2020.

If you are interested in being involved in ASABE, or in anything in this report, please reach out to Mark Ledebuhr. You do not need to be an engineer! (I'm not an engineer and I'm the Chairperson).

Respectfully submitted, 7/25/2019

Mark Ledebuhr

Chairperson, ASABE MS-23/6 and Liaison to AAPSE

Mobile: 517-202-6839, mark@applicationinsightllc.com

List of National Standards, Subcommittee, and next review date.

Committee	Full Designation	ASABE Review
MS-23/6 Application Systems	ASAE S327.4 JUL2012 (R2016) Terminology & Definitions for Application of Crop or Forestry Production & Protection Agents	12/1/2021
MS-23/6/1 Liquid Materials Application	ANSI/ASABE AD4254-6:2009 AUG2013 (R2017) Agricultural machinery - Safety - Part 6: Sprayers and liquid fertilizer distributors	12/1/2022
MS-23/6/1 Liquid Materials Application	ANSI/ASABE S592.1 AUG2016 Best Management Practices for Boom Spraying	12/1/2020
MS-23/6/1 Liquid Materials Application	ANSI/ASAE S572.2 JUL2018 Spray Nozzle Classification by Droplet Spectra	12/1/2022
MS-23/6/1 Liquid Materials Application	ASAE S561.1 APR2004 (R2018) Procedure for Measuring Drift Deposits from Ground, Orchard, and Aerial Sprayers	12/1/2023
MS-23/6/1 Liquid Materials Application	ASAE S471 MAR1991 (R2018) Procedure for Measuring Sprayer Nozzle Wear Rate	12/1/2023
MS-23/6/1 Liquid Materials Application	ASAE EP367.2 MAR1991 (R2017) Guide for Preparing Field Sprayer Calibration Procedures	12/1/2022
MS-23/6/1 Liquid Materials Application	ASAE S281.3 APR1987 (R2018) Capacity Designation for Fertilizer and Pesticide Hoppers and Containers	12/1/2023
MS-23/6/2 Aerial Application	ANSI/ASABE S641 MAY2018 Droplet Size Classification of Aerial Application Nozzles	12/1/2022
MS-23/6/2 Aerial Application	ASAE S386.2 FEB1988 (R2018) Calibration and Distribution Pattern Testing of Agricultural Aerial Application Equipment	12/1/2023
MS-23/6/3 Dry Materials	ASABE S573 OCT2018ED Procedure for Evaluating Variable Rate Granular Material Application Accuracy	12/1/2023
MS-23/6/3 Dry Materials	ASAE EP371.2 MAR2002 (R2016) Procedure for Calibrating Granular Applicators	12/1/2021
MS-23/6/3 Dry Materials	ASAE S341.5 MAY2018 Procedure for Measuring Distribution Uniformity and Calibrating Granular Broadcast Spreaders	12/1/2022

MS-23/6/5 Anhydrous Ammonia Equipment	ANSI/ASABE S620 MAR2017 Safety for Anhydrous Ammonia Application Equipment	12/1/2020
---------------------------------------	--	-----------

Continued:

List of ISO Standards maintained on behalf of the US by MS-23/6 family of committees (Actually, TC23/SC6, the ISO mirror group that exists parallel in ASABE)

TC23-SC6 A100	
Standard and Description	Most recent status
ISO 4102:1984	Confirmed
Equipment for crop protection -- Sprayers -- Connection threading	
ISO 4254-6:2009	To be Revised
Agricultural machinery -- Safety -- Part 6: Sprayers and liquid fertilizer distributors	
ISO 5681:1992	Close of Review
Equipment for crop protection -- Vocabulary	
ISO 5682-1:2017	Published
Equipment for crop protection -- Spraying equipment -- Part 1: Test methods for sprayer nozzles	
ISO 5682-2:2017	Published
Equipment for crop protection -- Spraying equipment -- Part 2: Test methods to assess the horizontal transverse distribution for hydraulic sprayers	
ISO 5682-3:2017	Published
Equipment for crop protection -- Spraying equipment -- Part 3: Test method to assess the performance of volume/area adjustment systems	
ISO 6686:1995	Confirmed
Equipment for crop protection -- Antidrip devices -- Determination of performance	

ISO 8169:1984	Confirmed
Equipment for crop protection -- Sprayers -- Connecting dimensions for nozzles and manometers	
ISO 8524:1986	Confirmed
Equipment for distributing granulated pesticides or herbicides -- Test method	
ISO 9357:1990	Confirmed
Equipment for crop protection -- Agricultural sprayers -- Tank nominal volume and filling hole diameter	
ISO 9898:2000	Confirmed
Equipment for crop protection -- Test methods for air-assisted sprayers for bush and tree crops	
ISO 10625:2018	Published
Equipment for crop protection -- Sprayer nozzles -- Colour coding for identification	
ISO 10626:1991	Confirmed
Equipment for crop protection -- Sprayers -- Connecting dimensions for nozzles with bayonet fixing	
ISO 10988:2011	To be Revised
Equipment for crop protection -- Knapsack motorized air-assisted sprayers -- Test methods and performance limits	
ISO/TS 11356:2011	Confirmed
Crop protection equipment -- Traceability -- Spray parameter recording	
ISO 12809:2011	To be Revised
Crop protection equipment -- Reciprocating positive displacement pumps and centrifugal pumps -- Test methods	
ISO 13440:1996	Confirmed
Equipment for crop protection -- Agricultural sprayers -- Determination of the volume of total residual	
ISO 13441-1:1997	
Air-assisted agricultural sprayers -- Data sheets -- Part 1: Typical layout	
ISO 13441-2:1997	Confirmed

Air-assisted agricultural sprayers -- Data sheets -- Part 2: Technical specifications related to components	
ISO 14131:2005	Confirmed
Agricultural sprayers -- Boom steadiness -- Test methods	
ISO 16119-1:2013	Confirmed
Agricultural and forestry machinery -- Environmental requirements for sprayers -- Part 1: General	
ISO 16119-2:2013	Confirmed
Agricultural and forestry machinery -- Environmental requirements for sprayers -- Part 2: Horizontal boom sprayers	
ISO 16119-3:2013	Confirmed
Agricultural and forestry machinery -- Environmental requirements for sprayers -- Part 3: Sprayers for bush and tree crops	
ISO 16119-4:2014	Published
Agricultural and forestry machinery -- Environmental requirements for sprayers -- Part 4: Fixed and semi-mobile sprayers	
ISO 16122-1:2015	Published
Agricultural and forestry machinery -- Inspection of sprayers in use -- Part 1: General	
ISO 16122-2:2015	Published
Agricultural and forestry machinery -- Inspection of sprayers in use -- Part 2: Horizontal boom sprayers	
ISO 16122-3:2015	Published
Agricultural and forestry machinery -- Inspection of sprayers in use -- Part 3: Sprayers for bush and tree crops	
ISO 16122-4:2015	Published
Agricultural and forestry machines -- Inspection of sprayers in use -- Part 4: Fixed and semi-mobile sprayers	
ISO 16236:2013	Confirmed
Crop protection equipment -- Test method for the determination of drainable volume and its concentration	
ISO 19732:2007	Confirmed

Equipment for crop protection -- Sprayer filters -- Colour coding for identification	
ISO 19932-1:2013	To be Revised
Equipment for crop protection -- Knapsack sprayers -- Part 1: Safety and environmental requirements	
ISO 19932-2:2013	To be Revised
Equipment for crop protection -- Knapsack sprayers -- Part 2: Test methods	
ISO 21278-1:2008	
Equipment for crop protection -- Induction hoppers -- Part 1: Test methods	
ISO 21278-2:2008	Confirmed
Equipment for crop protection -- Induction hoppers -- Part 2: General requirements and performance limits	
ISO 22368-1:2004	Confirmed
Crop protection equipment -- Test methods for the evaluation of cleaning systems -- Part 1: Internal cleaning of complete sprayers	
ISO 22368-2:2004	Confirmed
Crop protection equipment -- Test methods for the evaluation of cleaning systems -- Part 2: External cleaning of sprayers	
ISO 22368-3:2004	Confirmed
Crop protection equipment -- Test methods for the evaluation of cleaning systems -- Part 3: Internal cleaning of tank	
ISO 22369-1:2006	Confirmed
Crop protection equipment -- Drift classification of spraying equipment -- Part 1: Classes	
ISO 22369-2:2010	Confirmed
Crop protection equipment -- Drift classification of spraying equipment -- Part 2: Classification of field crop sprayers by field measurements	
ISO 22401:2015	Published
Equipment for crop protection -- Method for measurement of potential spray drift from horizontal boom sprayers by the use of a test bench	

ISO 22522:2007	Confirmed
Crop protection equipment -- Field measurement of spray distribution in tree and bush crops	
ISO 22763:2006	Confirmed
Equipment for crop protection -- Sprayers -- Demonstration track for field crop sprayers	
ISO 22856:2008	Confirmed
Equipment for crop protection -- Methods for the laboratory measurement of spray drift -- Wind tunnels	
ISO 22866:2005	Confirmed
Equipment for crop protection -- Methods for field measurement of spray drift	
ISO 24253-1:2015	Published
Crop protection equipment -- Spray deposition test for field crop -- Part 1: Measurement in a horizontal plane	
ISO 24253-2:2015	Published
Crop protection equipment -- Spray deposition test for field crop -- Part 2: Measurement in a crop	
ISO 25358:2018	Published
Crop protection equipment -- Droplet-size spectra from atomizers -- Measurement and classification	
ISO 28139:2009	To be Revised
Agricultural and forestry machinery -- Knapsack combustion-engine-driven mistblowers -- Safety requirements	