

Supplementary Material

How digital is agriculture in a subset of countries from South America? Adoption and limitations

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Supplementary material

Supplementary Table S1. List of papers and reports that met the search criteria for the review on adoption of Digital Agriculture in South America.

| Author | Publication year | Country/Region |
|---|------------------|----------------------|
| Melchiori <i>et al.</i> | 2018 | Argentina |
| Melchiori <i>et al.</i> | 2013 | Argentina |
| Kemerer <i>et al.</i> | 2020 | Argentina |
| Bolfe <i>et al.</i> | 2020 | Brazil |
| Berger, A <i>et al.</i> | 2019 | Uruguay |
| Duran <i>et al.</i> | 2021 | Chile |
| Borghi <i>et al.</i> | 2016 | Brazil |
| Bragachini <i>et al.</i> | 2004 | Argentina |
| Villalobos Mateluna <i>et al.</i> | 2009 | Chile |
| Villarroel <i>et al.</i> | 2020 | Argentina |
| Best and Vargas Quiñones | 2020 | Chile |
| Sotomayor <i>et al.</i> | 2021 | Latin America |
| Nagel J. | 2012 | Latin America |
| Fonseca Silveira Massruhá <i>et al.</i> | 2020 | Brazil |
| Pivoto <i>et al.</i> | 2019 | Brazil |
| Lachman and López | 2019 | Argentina |
| International Development Bank | 2019 | Latin America and Ca |
| Figueiredo <i>et al.</i> | 2021 | Brazil |
| Steinfeld <i>et al.</i> | 2021 | Uruguay |
| Bongiovanni <i>et al.</i> | 2006 | Latin America |
| Castaño J. | 2006 | Uruguay |
| Roel A. | 2005 | Uruguay |

Supplementary Table S2. List of Agricultural Mobile Applications, category, and source for download retrieves from the web search performed for the Region (Argentina, Chile, Uruguay and Brazil).

| ID | Name | Country | Classification | Short description | Link |
|----|----------------------|-----------|----------------|-------------------------------|---|
| 1 | AgreeMarket | Argentina | 1 | E commerce | https://www.agtech.org.ar/product/details/agreemarket |
| 2 | AgriRed | Argentina | 1 | Agriculture Commerce | https://www.agrired.com/ |
| 3 | AgroAds | Argentina | 1 | Marketplace | https://www.agtech.org.ar/product/details/agroads |
| 4 | Agroapp | Argentina | 1 | Spraying | https://www.agtech.org.ar/product/details/agroapparg |
| 5 | Agrobrowser | Argentina | 1 | Agrochemical database | https://agrobrowser.com/ |
| 6 | Agroconsultas Online | Argentina | 1 | Extension communication | https://www.agroconsultasonline.com.ar/ |
| 7 | AgroFinder Geo | Argentina | 1 | Machinery advertisement | https://play.google.com/store/apps/details?id=com.agrofinders.app&hl=en_US&gl=US |
| 8 | AgroFinders Leads | Argentina | 1 | Commerce Guide | https://www.agtech.org.ar/product/details/agrofindersleads |
| 9 | AgrofyNews | Argentina | 1 | Commodity prices | https://news.agrofy.com.ar/ |
| 10 | Agrolink | Argentina | 1 | Linking farmers - value chain | https://www.agtech.org.ar/product/details/agrolink |
| 11 | Agua Cero | Argentina | 1 | Extension education | https://play.google.com/store/apps/details?id=com.LudicFlame.Aguacero&hl=en_US&gl=US |
| 12 | Alertamos | Argentina | 1 | Clima | https://play.google.com/store/apps/details?id=alertamos.smn.gob.ar&hl=en_US&gl=US |
| 13 | Avancargo | Argentina | 1 | Logistics transport | https://www.agtech.org.ar/product/details/avancargo |
| 14 | Basto | Argentina | 1 | Virtual fence | http://www.xn--bast-tqa.com.ar/ |
| 15 | CABure | Argentina | 1 | Agrometeorological data | https://play.google.com/store/apps/details?id=com.cabure.app&hl=en_US&gl=US |
| 16 | Carnes Validadas | Argentina | 1 | Blockchain | https://www.carnesvalidadas.com/index_en.php |
| 17 | Criollo Atomozadores | Argentina | 1 | Weather app | https://play.google.com/store/apps/details?id=com.inta.criolloatm&hl=en_US&gl=US |

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|----|--------------------------|-----------|---|---------------------------|---|
| 18 | Criollo Mochilas INTA | Argentina | 1 | Weeds control | https://play.google.com/store/apps/details?id=com.inta.criollom&hl=en_US&gl=US |
| 19 | DIgiRodeo | Argentina | 1 | Cattle Sanitary registry | https://www.agtech.org.ar/product/details/httpsplaygooglecomstoreappsdeveloperiddigirodeosa |
| 20 | Don Mario | Argentina | 1 | Crop Catalog | https://www.donmario.com/nueva-app-donmario/ |
| 21 | GenGanar | Argentina | 1 | Animal Genetic E Commerce | https://www.genganar.com/genganar/ |
| 22 | Georuta | Argentina | 1 | Machinery location | https://www.agtech.org.ar/product/details/georuta |
| 23 | Guia CASAFE | Argentina | 1 | Phytosanitary handbook | https://play.google.com/store/apps/details?id=com.casafe.app&hl=es_CO |
| 24 | InfoCLima | Argentina | 1 | Nutrient info | https://play.google.com/store/apps/details?id=com.nuestroclima.mobile |
| 25 | Redsiembra | Argentina | 1 | Ecommerce | https://www.agtech.org.ar/product/details/redsiembra |
| 26 | Rendimiento Girasol INTA | Argentina | 1 | Yield estimator | https://play.google.com/store/apps/details?id=com.inta.girasol.rendimiento2&hl=en_US&gl=US |
| 27 | SeedMatriz | Argentina | 1 | Seed Treatments | https://seedmatriz.com/ |
| 28 | Suelos de Entre Rios | Argentina | 1 | Soil data | http://sepa.inta.gob.ar/sepa_movil/ |
| 29 | Agencia Virtual INTA | Argentina | 2 | Extension | https://play.google.com/store/apps/details?id=adif_relevamientos.com.ar.activities&hl=en_US&gl=US |
| 30 | Agritask | Argentina | 2 | Integrated Management | https://www.agtech.org.ar/product/details/agritask |
| 31 | AgroQR | Argentina | 2 | Stock Control | https://www.agtech.org.ar/product/details/agroqr |
| 32 | AlborGo | Argentina | 2 | Scouting | https://www.agtech.org.ar/product/details/albor-go |
| 33 | Analiza Tu Tambo INTA | Argentina | 2 | Dairy | https://play.google.com/store/apps/details?id=inta.analiza.tu.tambo&hl=en_US&gl=US |
| 34 | Anote | Argentina | 2 | Grain Commercialization | https://www.agtech.org.ar/product/details/anote |
| 35 | Bolsa de Cereales | Argentina | 2 | Market prices | https://play.google.com/store/apps/details?id=app.CAC.BCR&hl=es_CL |

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| 36 | Campero INTA | Argentina | 2 | Planter regulation | https://play.google.com/store/apps/details?id=com.inta.campero&hl=en_US&gl=US |
| 37 | COMpara tu tambo INTA | Argentina | 2 | Data recording | https://play.google.com/store/apps/details?id=inta.compara.tu.tambo&hl=en_US&gl=US |
| 38 | Criollo INTA | Argentina | 2 | Sprayer | https://play.google.com/store/apps/details?id=com.inta.criollo2&hl=en_US&gl=US |
| 39 | DIagnostico Express INTA | Argentina | 2 | Diagnostic | https://play.google.com/store/apps/details?id=com.pablopautasso.enfermedadesplantas&hl=en_US&gl=US |
| 40 | GeoAgris Mapa de Rendimeinto | Argentina | 2 | Yield maps | https://www.agtech.org.ar/product/details/mapa-de-rendimiento |
| 41 | Geoagro | Argentina | 2 | Scouting | https://site.geoagro.com/ |
| 42 | GeoINTA | Argentina | 2 | Weather, soil | http://visor.geointa.inta.gob.ar/ |
| 43 | Google Earth | Argentina | 2 | Satellite image | https://play.google.com/store/apps/details?id=com.google.earth&hl=es_CL |
| 44 | Inteliagro | Argentina | 2 | Ecommerce | https://www.agtech.org.ar/product/details/inteliagro |
| 45 | Ke Insumos | Argentina | 2 | Inputs commercialization | https://www.keinsumos.com/ |
| 46 | Manuales RIAN INTA | Argentina | 2 | Management Guides | https://play.google.com/store/apps/details?id=com.inta.rian.manuales2&hl=en_US&gl=US |
| 47 | Mapa de prescriociones y aplicaciones Preseed | Argentina | 2 | Management zones | https://www.agtech.org.ar/product/details/prescripciones |
| 48 | Margenes Agricolas INTA | Argentina | 2 | Profit calculator | https://play.google.com/store/apps/details?id=ar.gob.inta.imargenes&hl=en_AU&gl=US |
| 49 | Microwine Predictor INTA | Argentina | 2 | Quality determination | https://play.google.com/store/apps/details?id=com.inta.microwinepredictor&hl=en_US&gl=US |
| 50 | Canopeo | Argentina | 2 | Coverage determination | https://play.google.com/store/apps/details?id=okstate.edu.canopeo |
| 51 | S4Index | Argentina | 2 | Risk assessment | https://www.agtech.org.ar/product/details/httpwwwcoberturaindexs4comcalculadoramainpage |

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| 52 | Sacha | Argentina | 2 | Field Scouting | https://play.google.com/store/apps/details?id=com.sachaapp&hl=en_US&gl=US |
| 53 | Malezas Argentinas | Argentina | 2 | Weeds identification | https://play.google.com/store/apps/details?id=com.malezarg.maxfraire.maleza&hl=es_PY&gl=US |
| 54 | SmartSiloBag | Argentina | 2 | IoT control | https://www.agtech.org.ar/product/details/smartsilobag |
| 55 | Soy Agro | Argentina | 2 | Agronomical Engineer Professionals AP | https://play.google.com/store/apps/details?id=com.upvoy.soyagro |
| 56 | Suelos de Córdoba | Argentina | 2 | Integrated Management | https://play.google.com/store/apps/details?id=com.ciampagna.portaldelsuelos&hl=en_US&gl=US |
| 57 | Ursula | Argentina | 2 | GIS software | https://www.ursulagis.com/ |
| 58 | BajoRIego | Argentina | 3 | Irrigation management | http://bajoriego.com.ar/app/ |
| 59 | Campo360 | Argentina | 3 | Integrated Management | https://play.google.com/store/apps/details?id=com.geoagro.campo360&hl=es_CL |
| 60 | Centro de Operaciones John Deere | Argentina | 3 | Administration | https://www.deere.com.ar/es/agricultura-de-precisi%C3%B3n/gerenciamiento-de-informaci%C3%B3n/centro-de-operaciones/ |
| 61 | Croptical | Argentina | 3 | Satellite-Weather data | https://www.agtech.org.ar/product/details/croptical |
| 62 | Echelon Nutrien Ag | Argentina | 3 | PAG Data Management | https://www.echelon.com.ar/ |
| 63 | GestionPlay Agroplanenat | Argentina | 3 | Farm administration | https://www.agroplaneta.com/ |
| 64 | Mapa de Ambientes GEoagris | Argentina | 3 | Management zones | https://agtech.org.ar/product/details/mapa-de-ambientes |
| 65 | My John Deere | Argentina | 3 | Machinery platform | https://myjohndeere.deere.com/mjd/my/login?Language=es&Country=ES |
| 66 | MyNutrient | Argentina | 3 | Customer Platform | https://nutrienagsolutions.com.ar/ |
| 67 | Optiagro | Argentina | 3 | PAG Data Management | https://optiagro.com/ |
| 68 | PUMA | Argentina | 3 | PA Data Management | https://www.agtech.org.ar/product/details/wwwagropumacom |

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| 69 | S4Go | Argentina | 3 | Scouting and prescriptions | https://www.agtech.org.ar/product/details/s4go |
| 70 | SIMA | Argentina | 3 | Scouting | sima.ag |
| 71 | FormAgro | Argentina | 4 | Integral Management | https://www.formagro.com/servicios-agricultura-ganaderia.php |
| 72 | ACA Mi Campo | Argentina | 4 | Farm Management | https://play.google.com/store/apps/details?id=com.acamicampo |
| 73 | Auravant | Argentina | 4 | PA Data Management | https://www.auravant.com/en/home/ |
| 74 | BoosterAgro | Argentina | 4 | Meteorological data | https://play.google.com/store/apps/details?id=com.boosteragtech.boosteragro&hl=en_US&gl=US |
| 75 | FieldView | Argentina | 4 | Farm Management | https://climatefieldview.com.ar/ |
| 76 | Kilimo | Argentina | 4 | PA Data Management | https://www.kilimoagtech.com/ |
| 77 | Mi Lote | Argentina | 4 | Farm management | https://www.milote.io/auth/log-in |
| 78 | Ponce | Argentina | 4 | Irrigation management | https://www.agtech.org.ar/product/details/monitoreo-y-deteccion-de-fallas-de-equipos-de-riego-agricola |
| 79 | Prescripciones Geoagris | Argentina | 4 | Input prescriptions | https://www.agtech.org.ar/product/details/prescripciones-2 |
| 80 | Taranis | Argentina | 4 | Integral Management | https://taranis.ag/locations_item/argentina-hq/ |
| 81 | Vistaguay | Argentina | 4 | Farm management | https://www.vistaguay.com/ |
| 82 | Accuweather | Brazil | 1 | weather app | https://www.accuweather.com/ |
| 83 | Adama alvo | Brazil | 1 | pest management | https://www.adama.com/brasil/pt/adama-inovacao/adama-alvo |
| 84 | Agritempo | Brazil | 1 | weather app | https://www.embrapa.br/busca-de-solucoes-tecnologicas/-/produto-servico/2109/agritempo-movel---agritempo-movel---sistema-de-monitoramento-agrometeorologico-movel |
| 85 | AgroMercado | Brazil | 1 | quotes | https://appagg.com/android/finance/agromercado-cotacoes-agropecuarias-28568759.html?hl=pt |
| 86 | Alcool ou gasolina, Chefia | Brazil | 1 | efficiency | https://www.techtudo.com.br/tudo-sobre/alcool-ou-gasolina-chefia.html |

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| 87 | AppLeite | Brazil | 1 | dairy - library | https://www.embrapa.br/busca-de-solucoes-tecnologicas/-/produto-servico/5252/appleite---aplicativo-para-produtor-de-leite |
| 88 | Assodeere | Brazil | 1 | John deere brazilian distributors association | https://assodeere.com.br/ |
| 89 | BNDES Agro | Brazil | 1 | financing options app | https://www.bndes.gov.br/ |
| 90 | Bulario defensivos agricolas | Brazil | 1 | which herbicide recommendati on | https://play.google.com/store/apps/details?id=appsmoveis.com.br.bulariodefensivosagricolas&hl=en&gl=US |
| 91 | Climatempo | Brazil | 1 | weather app | https://www.climatempo.com.br/ |
| 92 | Consortio antiferrugem | Brazil | 1 | soybean rust management | https://www.embrapa.br/busca-de-noticias/-/noticia/57357772/consorcio-anti-ferrugem-atualiza-ferramentas-digitais-para-incrementar-o-monitoramento-da-ferrugem-da-soja |
| 93 | Custo facil | Brazil | 1 | swine and poultry | https://www.embrapa.br/suinos-e-aves/cias/custos/custo-facil |
| 94 | Doutor milho | Brazil | 1 | maize - library and field management | https://www.embrapa.br/busca-de-solucoes-tecnologicas/-/produto-servico/3991/aplicativo---doutor-milho |
| 95 | Fitoherb | Brazil | 1 | herbicide toxicity identification | https://fitoherb.br.aptoide.com/app |
| 96 | FMC Agricola | Brazil | 1 | weed and pest management | https://www.fmcagricola.com.br/ |
| 97 | Fox Bayer | Brazil | 1 | pest management | http://fox-bayer.appstor.io/ |
| 98 | Frete Empresa NTC | Brazil | 1 | transport cost | https://transp.net/ntc-lanca-aplicativo-que-calcula-o-valor-do-frete/ |
| 99 | Herbicida Certo | Brazil | 1 | weed id manual | https://www.herbicidacerto.com/ |
| 100 | Indice de antecipacao de pneus | Brazil | 1 | Equipment maintenance | https://agrofitocase.com.br/2016/05/18/aplicativo-case-ih-indice-de-antecipacao-de-pneus/ |

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|-----|--------------------------|--------|---|------------------------------------|---|
| 101 | INMET | Brazil | 1 | weather app | https://portal.inmet.gov.br/ |
| 102 | IZAgro | Brazil | 1 | library | https://www.izagro.com.br/inicio?hjDelay=10000 |
| 103 | Jacto Connect | Brazil | 1 | spray nozzle selection | https://play.google.com/store/apps/details?id=com.jacto.connect&hl=en_CA&gl=US |
| 104 | Pastejando | Brazil | 1 | Forage planning | https://play.google.com/store/apps/details?id=br.embrapa.pastejando&hl=en&gl=US |
| 105 | PlantNet | Brazil | 1 | weed identification | https://identify.plantnet.org/ |
| 106 | Preco dos combustiveis | Brazil | 1 | Fuel price | https://precodoscombustiveis.com.br/ |
| 107 | Revista Globo Rural | Brazil | 1 | magazine library | https://revistagloborural.globo.com/Noticias/noticia/2014/01/baixe-agora-o-aplicativo-gratis-da-globo-rural-em-seu-celular.html |
| 108 | TeeJet | Brazil | 1 | spray application guide | https://www.teejet.com/tools/spray-nozzle_selection.aspx |
| 109 | Tempo Agora | Brazil | 1 | weather app | https://www.tempoagora.com.br/ |
| 110 | TruckPad Fretes e Cargas | Brazil | 1 | transport cost | https://www.truckpad.com.br/fretes/ |
| 111 | Weed ID | Brazil | 1 | weed information | https://weedout.com.br/plantas-daninhas-aplicativos/ |
| 112 | Windfinder | Brazil | 1 | weather info for spray application | https://www.windfinder.com/ |
| 113 | Yara CheckIT | Brazil | 1 | nutrient deficiency identification | https://www.yara.us/crop-nutrition/tools-and-services/checkit/ |
| 114 | Zarc | Brazil | 1 | planting zones | https://play.google.com/store/apps/details?id=embrapa.br.zonamento&hl=en_US&gl=US |
| 115 | Agropocket | Brazil | 2 | crop management | https://agropocket.com.br/ |
| 116 | ApplyPlus LA | Brazil | 2 | application app | https://play.google.com/store/apps/details?id=com.deere.applyplusla&hl=en_IN&gl=US |
| 117 | BuscaCargas | Brazil | 2 | Logistics transport | https://www.buscacargas.com.br/home2/ |

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| 118 | Ciclo Suplementacao Minerthal | Brazil | 2 | Livestock feeding | https://play.google.com/store/apps/details?id=br.com.minerthal.ciclo&hl=en&gl=US |
| 119 | Cota agro | Brazil | 2 | quotes and sales | https://www.cotaagro.com/ |
| 120 | Defesa vegetal | Brazil | 2 | weed and pest management | https://apkpure.com/br/defesa-vegetal/com.studiomoob.defesavegetal |
| 121 | Detector de pragas | Brazil | 2 | pest management | https://apkpure.com/br/detector-de-pragas/com.ufms.cppp.detectordepragas |
| 122 | FalkerMap | Brazil | 2 | PA maps | https://www.falker.com.br/ |
| 123 | Fretebras | Brazil | 2 | Logistics transport | https://www.fretebras.com.br/ |
| 124 | General do campo | Brazil | 2 | equipment management | https://play.google.com/store/apps/details?id=com.generaldocampo |
| 125 | GPS Essentials | Brazil | 2 | measuring app | https://gps-essentials.en.uptodown.com/android |
| 126 | Guia inNAT | Brazil | 2 | pest management | https://www.embrapa.br/busca-de-solucoes-tecnologicas/-/produto-servico/5236/aplicativo-guia-innat---guia-para-o-reconhecimento-de-inimigos-naturais-de-pragas-agricolas |
| 127 | Lynx dashboard | Brazil | 2 | farm management | http://www.lynxdashboard.com.br/ |
| 128 | Nutricao de Safras | Brazil | 2 | nutrient recommendation | https://mosaic.nutricaoadesafras.com.br/recomendacao-no-app |
| 129 | PlantSnap | Brazil | 2 | weed identification | https://www.plantsnap.com/ |
| 130 | Pragueiro | Brazil | 2 | pest management | https://www.agrosoft.com.br/ |
| 131 | ReceituAgro | Brazil | 2 | pesticide consult and info | https://www.agran.eng.br/receituagro |
| 132 | WebGis | Brazil | 2 | PA maps | http://www.ufrgs.br/webgistaim/webgis.html |
| 133 | WeedApp Nufarm | Brazil | 2 | weed identification | https://apps.apple.com/br/app/weedapp-nufarm/id1266253442 |
| 134 | Aegro | Brazil | 3 | financial management | https://aegro.com.br/ |

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| 135 | Bovcontrol | Brazil | 3 | Livestock control | https://platform.bovcontrol.com/ |
| 136 | Ebarn | Brazil | 3 | buying and selling production | https://ebarn.com.br/ |
| 137 | FarmQA Scouting | Brazil | 3 | tool for agronomic consultants | https://farmqa.com/ |
| 138 | Jetbov | Brazil | 3 | cattle | https://jetbov.com/ |
| 139 | John Deere Conecta | Brazil | 3 | machine add | https://conecta.deere.com.br/apps/ |
| 140 | Maqcampo | Brazil | 3 | equipment management | http://www.maqcampo.com.br/ |
| 141 | My John Deere | Brazil | 3 | Machinery administration | https://myjohndeere.deere.com/mjd/my/login?Language=es&Country=ES |
| 142 | Roda da reproducao | Brazil | 3 | Cattle | https://www.embrapa.br/busca-de-solucoes-tecnologicas/-/produto-servico/5423/aplicativo-roda-da-reproducao---programa-balde-cheio |
| 143 | Siagri | Brazil | 3 | field and office management | http://novidades.siagri.com.br |
| 144 | SIMA | Brazil | 3 | Scouting | https://www.sima.ag/pt |
| 145 | Suplementa certo | Brazil | 3 | cattle nutrition | https://www.embrapa.br/busca-de-noticias/-/noticia/2184283/nova-versao-do-aplicativo-suplementa-certo-ja-esta-disponivel |
| 146 | Uboi | Brazil | 3 | Livestock transport | https://play.google.com/store/apps/details?id=uBoi.uBoi&hl=pt_BR&gl=US |
| 147 | 4milk | Brazil | 4 | dairy management and sales | http://www.4milk.com.br/ |
| 148 | Agri-trend | Brazil | 4 | PA Data Management | https://agriculture.trimble.com/software/agri-trend/ |
| 149 | Agrol | Brazil | 4 | farm management | https://agrol.inf.br/ |
| 150 | Auravant | Brazil | 4 | Integral Management | https://www.auravant.com/pt/principio/ |
| 151 | Easyfarm | Brazil | 4 | farm management | https://easyfarm.io/ |

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|-----|--------------------------------|--------|---|-------------------------------------|---|
| 152 | FarmDesk | Brazil | 4 | farm management | https://app.farmdesk.com.br/login |
| 153 | Field Manager | Brazil | 4 | Farm management | https://fm.xarvio.com/br/pt_br/login |
| 154 | FieldNet | Brazil | 4 | equipment and irrigation management | http://agropivot.com.br/Produtos-FieldNET |
| 155 | FieldView | Brazil | 4 | PA Data Management | www.fieldview.com.ar |
| 156 | Realidade aumentada John Deere | Brazil | 4 | equipment add | https://play.google.com/store/apps/details?id=com.deere.JohnDeereARFoundation&hl=en_US&gl=US |
| 157 | Granular | Brazil | 4 | Fertilization recommendation | https://www.corteva.com.br/produtos-e-servicos/agricultura-digital.html |
| 158 | A cuanto? | Chile | 1 | Prices | https://play.google.com/store/apps/details?id=cl.odepa.mayorista.frutahortaliza&hl=en&gl=US |
| 159 | Agropredial | Chile | 1 | productive aptitude | https://apps.apple.com/tt/app/agropredial/id1544020566?ign-mpt=uo%3D2 |
| 160 | Agrosolucion | Chile | 1 | Phytosanitary guide | https://play.google.com/store/apps/details?id=cl.kunder.agrosolucion |
| 161 | Campo clima | Chile | 1 | Weather data | https://play.google.com/store/apps/details?id=cl.elun.campo_clima&hl=en&gl=US |
| 162 | GeoPortal Chile | Chile | 1 | GIS Chile | https://www.ide.cl/ |
| 163 | ChileAgricola | Chile | 1 | E commerce | https://www.chile-agricola.com/app.html |
| 164 | Climachile | Chile | 1 | Weather | https://apkcombo.com/es/climate-chile-free/com.climachilegratis.climagratias.weatherglobal/ |
| 165 | Frutas de chile | Chile | 1 | Extension | www.fruitsfromchile.com |
| 166 | Geolocalizador del Agro | Chile | 1 | Ecommerce | http://geolocalizador.ciren.cl/ |
| 167 | Insectarium | Chile | 1 | insect recognition | https://play.google.com/store/apps/details?id=com.AfipaOktopus.InsectariumAfipaAR |
| 168 | MeteoChile | Chile | 1 | Weather | https://play.google.com/store/apps/details?id=cl.gob.dgac.dmc |
| 169 | Weather Chile | Chile | 1 | Weather | https://play.google.com/store/apps/details?id=cn.museedu.weatherchile |

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|-----|---|-------|---|------------------------------|---|
| 170 | Meteorología Chile | Chile | 1 | Weather | https://play.google.com/store/apps/details?id=com.infoaccion.meteo&hl=es_D O |
| 171 | SAG requisitos Fitosanitarios Exportacion | Chile | 1 | Policy | http://www.sag.cl/noticias/sag-lanza-aplicacion-de-consulta-gratuita-sobre-requisitos-fitosanitarios-para-exportaciones-de-productos-agricolas-y-forestales-para-celulares |
| 172 | SmartInia | Chile | 1 | Pasture fertilization | https://biblioteca.inia.cl/discover?query=app+movil |
| 173 | App TelemetriaRiego | Chile | 2 | Irrigation channels control | https://www.mundoagro.cl/nueva-app-para-regantes-del-rio-choapa/ |
| 174 | CampoClick | Chile | 2 | Ecommerce | www.campoclick.cl |
| 175 | Agrobook Watts | Chile | 2 | Scouting record | https://play.google.com/store/apps/details?id=cl.agrosat.agrobookwatts |
| 176 | Campogest | Chile | 2 | administration | https://www.campogest.com/ |
| 177 | Denuncias fitosanitarias SAG | Chile | 2 | Pest report | http://www.sag.cl/content/denuncias-y-alertas-fitosanitarias-descarga-apk |
| 178 | MateoApp | Chile | 2 | Pest and diseases diagnostic | https://www.inia.cl/mateo/ |
| 179 | MODAG | Chile | 2 | Scouting | https://www.modag.cl/web/login |
| 180 | Agrapp | Chile | 3 | farm management | www.agrapp.cl |
| 181 | SGS | Chile | 3 | Precision agriculture | https://www.sgs.cl/es-es/agriculture-food/seed-and-crop/soil-leaf-and-water-services/precision-farming |
| 182 | Agrodoctor | Chile | 3 | Monitor | https://agropuente.cl/en/agrodoctor-app-2/ |
| 183 | Agropartner | Chile | 3 | online sales | https://agropartner.cl/ |
| 184 | Agropreciso | Chile | 3 | Integral platform | https://www.agropreciso.com/ |
| 185 | AppSofia | Chile | 3 | Gestion integral | http://www.sofiagestionagricola.cl/plataforma/ |
| 186 | Cuencas Chile | Chile | 3 | Water irrigation monitoring | https://play.google.com/store/apps/details?id=com.cuencas.celadores |
| 187 | Cultiia | Chile | 3 | weather indices | https://play.google.com/store/apps/details?id=smartdici.app.cultiia&hl=en&gl=US |

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|-----|-------------------|---------|---|------------------------------|---|
| 188 | Intertek | Chile | 3 | data analysis | www.intertek.cl |
| 189 | My John Deere | Chile | 3 | Machinery administration | https://myjohndeere.deere.com/mjd/my/login?Language=es&Country=ES |
| 190 | OkFruitApp | Chile | 3 | fruit quality | https://play.google.com/store/apps/details?id=com.ferativ.ok_fruit_app&hl=en&gl=US |
| 191 | Wiseconn | Chile | 3 | Irrigation management | https://www.wiseconn.cl/ |
| 192 | Agri | Chile | 4 | farm management | www.agri.cl |
| 193 | Camponectado | Chile | 4 | Management platform | http://www.camponectado.com/ |
| 194 | Inatacrops | Chile | 4 | Plataforma iot | https://www.instacrops.com/ |
| 195 | Kilimo | Chile | 4 | Irrigation management | https://kilimoagtech.com/en/ |
| 196 | Agrobase | Region | 1 | library | https://agrobaseapp.com/ |
| 197 | ADP zone | Uruguay | 1 | markets | https://play.google.com/store/apps/details?id=com.adp.adpzone |
| 198 | Bioceres semillas | Uruguay | 1 | Seeds data | https://play.google.com/store/apps/developer?id=OKARATech |
| 199 | e-cursos | Uruguay | 1 | Training | https://www.agroit.com.uy/ |
| 200 | Fertiliz-Arr | Uruguay | 1 | Rice fertilization tool INIA | http://www.inia.uy/investigaci%C3%B3n-e-innovaci%C3%B3n/programas-nacionales-de-investigaci%C3%B3n/Programa-Nacional-de-Investigacion-en-Produccion-de-Arroz/fertiliz-arr-una-herramienta-inia-para-la-fertilizaci%C3%B3n-en-arroz |
| 201 | Ganadera Uruguay | Uruguay | 1 | ecommerce | https://appadvice.com/app/ganadera-uruguay/1132710796 |
| 202 | INAC | Uruguay | 1 | Markets | https://www.inac.uy/innovaportal/v/12226/10/innova.front/aplicaciones-moviles-de-inac |
| 203 | INACcortes | Uruguay | 1 | Meat cuts and info | https://www.inac.uy/innovaportal/v/12226/10/innova.front/aplicaciones-moviles-de-inac |
| 204 | Madera apilada | Uruguay | 1 | Wood measurement | https://www.agroit.com.uy/ |
| 205 | Medicion rolos | Uruguay | 1 | Wood counting | https://www.agroit.com.uy/ |
| 206 | OKT Clima | Uruguay | 1 | Weather | https://play.google.com/store/apps/developer?id=OKARATech |
| 207 | OKT Mercado | Uruguay | 1 | markets | https://play.google.com/store/apps/developer?id=OKARATech |

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|-----|--------------------|---------|---|----------------------------|---|
| 208 | OKT Muestras | Uruguay | 1 | Sampling | https://play.google.com/store/apps/developer?id=OKARATech |
| 209 | OptiFert-P | Uruguay | 1 | Fertilization Tool INIA | http://www.inia.uy/estaciones-experimentales/direcciones-regionales/inia-tacuaremb%C3%B3/Herramienta-OptiFert-P-para-definir-fertilizacion-fosfatada |
| 210 | P-FOR INIA | Uruguay | 1 | Forestry | http://www.inia.uy/estaciones-experimentales/direcciones-regionales/inia-tacuaremb%C3%B3/otros-contenidos/p-for-inia-aplicaci%C3%B3n-para-celulares-de-protecci%C3%B3n-forestal |
| 211 | SAC | Uruguay | 1 | Corrective action request | https://www.agroit.com.uy/ |
| 212 | SMM | Uruguay | 1 | Mobile mark | https://www.agroit.com.uy/ |
| 213 | Control de campo | Uruguay | 2 | Livestock registry | http://www.serc.com.uy/Home/MediaList?area=moviles&title=Aplicaciones%20M%C3%B3viles |
| 214 | EnPastoreo | Uruguay | 2 | Pasture grazing estimation | https://play.google.com/store/apps/details?id=com.planagropecuario.enpastoreo&hl=it&gl=US |
| 215 | GESIR | Uruguay | 2 | Irrigation Tool INIA | http://inia.uy/Documentos/P%C3%BAblicos/UCTT/GESIR/Manual%20de%20usuario%20de%20GESIR-INIA.pdf |
| 216 | IDE XLS, app móvil | Uruguay | 2 | Livestock registry | http://www.serc.com.uy/Home/MediaList?area=moviles&title=Aplicaciones%20M%C3%B3viles |
| 217 | RAPF | Uruguay | 2 | Spraying registry | https://www.mgap.gub.uy/dgsadayddaplicacion/inicioweb.aspx |
| 218 | Rurak | Uruguay | 2 | ecommerce | https://rural.com.uy/download_app |
| 219 | Termoestres bovino | Uruguay | 2 | Animal Stress Alarm | http://www.inia.uy/gras/Alertas-y-herramientas/Prevision-ITH-Vacunos/. |
| 220 | Trique | Uruguay | 2 | red social | https://www.triqueapp.com/ |
| 221 | Conteode Ovinos | Uruguay | 3 | Animal counting | https://bqn.com.uy/conteo-de-ovinos-con-drones/ |
| 222 | My John Deere | Uruguay | 3 | Machinery administration | https://myjohndeere.deere.com/mjd/my/login?Language=es&Country=ES |
| 223 | OKT Regorrida | Uruguay | 3 | Scouting book | https://play.google.com/store/apps/developer?id=OKARATech |
| 224 | SARAS | Uruguay | 3 | Asian Rust Alert INIA | http://www.inia.uy/estaciones-experimentales/direcciones-regionales/inia-la-estanzuela/saras-sistema-de-alerta-a-roya-asi%C3%A1tica |
| 225 | SIGRAS App | Uruguay | 3 | NDVI Weather | http://www.inia.uy/gras/Alertas-y-herramientas/sigras-app |

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|-----|------------|---------|---|-------------------------|---|
| 226 | SIMA | Uruguay | 3 | Scouting and management | https://www.sima.ag/en |
| 227 | Vigia SNIG | Uruguay | 3 | Management platform | https://play.google.com/store/apps/details?id=com.mgap.snig.snigappveterinarias&hl=it&gl=US |
| 228 | Auravant | Uruguay | 4 | farm management | https://www.auravant.com/#plataforma |
| 229 | FieldView | Uruguay | 4 | farm management | https://climatefieldview.com.uy/ |
| 230 | Kilimo | Uruguay | 4 | Water prescription | https://kilimoagtech.com/es/ |
| 231 | negoAgro | Uruguay | 4 | Cattle | negoagro.com |

Supplementary Table S3. Country, production system, role, description, and size of operations for the study cases.

| ID | Country | Production system | Role | Description | Size of operation (ha)/number of animals |
|----|-----------|------------------------|------|---|--|
| 1 | Argentina | Agriculture | CC | corn, soybean, wheat, barley | 40000/0 |
| 2 | Argentina | Agriculture | G | corn, soybean, wheat, barley | 7000/0 |
| 3 | Argentina | Agriculture | CC | cattle and row crops | 15000/na |
| 4 | Argentina | Agriculture | CC | cattle and row crops | 3000/na |
| 5 | Argentina | Dairy | G | milk, pasture, silage | na/15000 |
| 6 | Brazil | Agriculture | G | diversified rural producer | 54/0 |
| 7 | Brazil | Agriculture | G | rural producer of agricultural crops | 2650/0 |
| 8 | Brazil | Agriculture | SP | aerial application, agrochemicals, sugarcane | 1250000/0* |
| 9 | Brazil | Agriculture/ Cattle | SP | insurance, pesticides, seeds and fertilizers, livestock, and forestry | 11100000/0* |
| 10 | Brazil | Agriculture | G | - | 750/0 |
| 11 | Brazil | Agriculture | G | - | 2063/0 |
| 12 | Brazil | Agriculture | G | - | 1300/0 |
| 13 | Brazil | Agriculture | G | - | 1600/0 |
| 14 | Brazil | Agriculture | G | - | 700/0 |
| 15 | Uruguay | Tree farm | G | - | - |
| 16 | Uruguay | Tree farm | G | pine trees | 40000/0 |
| 17 | Uruguay | Tree farm | G | - | 2300/0 |
| 18 | Uruguay | Cattle | G | cattle, pasture | - |
| 19 | Uruguay | Cattle | G | cattle, sheep, rice | 5320/na |
| 20 | Uruguay | Cattle | G | cattle | 640/na |
| 21 | Uruguay | Cattle | G | cattle | 3300/na |
| 22 | Uruguay | Cattle | G | cattle | 1448/na |
| 23 | Uruguay | Cattle | G | cattle | 2400/na |
| 24 | Uruguay | Cattle | G | cattle | 6000/na |
| 25 | Uruguay | Cattle | G | cattle, silage | 1000/na |
| 26 | Uruguay | Agriculture | CC | row crops and pastures | 46000/0 |
| 27 | Uruguay | Agriculture | G | agriculture, tree farm, cattle | - |
| 28 | Uruguay | Agriculture | G | row crop | 5500/0 |
| 29 | Uruguay | Agriculture | CC | row crop | 8000/0 |
| 30 | Uruguay | Agriculture | CC | corn, millet, canola, soy | 40000/0 |
| 31 | Uruguay | Agriculture | CC/G | corn, soybean, rice | 350/0 |
| 32 | Chile | Horticulture | G | cherries, grapes | 200/0 |
| 33 | Chile | Horticulture | G | grapes | 300/0 |
| 34 | Chile | Horticulture | CC | fruits, intensive crops | - |

*Number of hectares covered by service provider

APPENDIX A

Interview questions used for case studies:

- 1) Brief introduction about your operation or
- 2) How do you define digital agriculture?
- 3) When did you start using DA/PA technology?
- 4) What digital ag technology do you use the most? And in what crop? And how many acres?
- 5) What was the main driver to adopt technology?
- 6) What's the limiting factor when it comes to adopting/using a new technology?
- 7) Do you measure/How do you measure the impact of technology?
- 8) What technology would you like to implement but it is not in the market yet?
- 9) Were you able to increase the adoption of PA and DA with colleagues?
- 10) How do you see the future of technology applied to the Farms?
- 11) Which role plays data acquisition, data processing and data driven decision making in your system?
- 12) Can you mention an example of any PA tool that certainly allowed you to make a better decision compared to a colleague?
- 13) Do you think that your workforce is positioned to embrace leading-edge technologies?

APPENDIX B

AgTech companies can be grouped according to their focus: segmentation, monitoring, control, and others. The first group refers to those companies that focus on gathering different databases to identify variability and separate either land or livestock into homogeneous groups to apply different management practices (e.g., MZ delimitation, variable rate application of inputs, segmented feeding for animals, etc.). The second group is related to companies that focus on IoT and other technologies for real time monitoring of the field or animals, registering the data and making it available for further processing (e.g., yield monitor, pest, and diseases detection, monitor of conversion rate for animals). The third group include those companies related with the control of productive processes (e.g., field work control, control of best management practices) and other includes applications on the value chain (traceability, logistics, crowdfunding) (Lachman and López 2019).

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