



**Chikondwerero Chokumbukira kuti Patha Zaka 20 Chiyikireni pa Msika wa Dziko Lonse la Pansi Mbewu Zamakono (Zomwe Chikhalidwe Chake Chinasinthidwa Pogwiritsa Ntchito Maluso a Sayansi/Mbewu Zomwe Chikhalidwe Chake Chinasinthidwa Polowetsa Tinthu Tomwe Timawonetsa Chikhalidwe Cha Mbewu Zina Mkati Mwake): 1996 mpaka 2015**

**Wolemba ndi Clive James, yemwe anayambitsa komanso wapampando wopuma wa bungwe la ISAAA**

**Mlembi Dr. Clive James wachipereka cholembedwa ichi kwa mphunzitsi wake komanso mzake wogwira naye ntchito malemu Nobel Peace Laureate, Norman Borlaug komanso wothandiza yemwenso anayambitsa bungwe la ISAAA**

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**MFUNDO ZIKULUZIKULU KHUMI zokhudza Mbewu Zamakono (Zomwe Chikhalidwe Chake Chinasinthidwa Pogwiritsa Ntchito Maluso a Sayansi/Mbewu Zomwe Chikhalidwe Chake Chinasinthidwa Polowetsa Tinthu Tomwe Timawonetsa Chikhalidwe Cha Mbewu Zina Mkati Mwake) muzaka Zoyambirira 20, 1996 mpaka 2015.**

**MFUNDO #1. 2015 chinali chaka cha 20 ntchito yoyika pa msika mbewu zamakono (zomwe chikhalidwe chake chinasinthidwa pogwiritsa ntchito maluso a sayansi) yikuyenda bwino.** Mahekala omwe pamalimidwa mbewu zamakonozi amachulukirachulukira chaka ndi chaka ndipo muzaka 20 zomwe zapitazi: 1996 mpaka 2015 mahekala 2 biliyoni, omwe ndi malo okula kutayimiza kawiri malo onse omwe ndi dziko la US (mahekala 937 miliyoni), analimidwa dziko lonse la pansu mumayiko okwana 28; Mwakupenekera, mphindu lomwe alimi anapeza kuyambira chaka cha 1996 mpaka 2015 ndi lopitirira US\$150 biliyoni. Alimi okwana 18 miliyoni, lolera kupeza mphindu lochepa, anapeza mphindu chaka ndi chaka ndipo 90% mwa alimi amenewa ndi alimi ang'onoang'ono, alimi omwe alibe zipangizo zoyenerera amumayiko osawuka.

**MFUNDO #2. Kuvomerredzedwa/kulandiridwa kwa mbewu zamakono muzaka 20 zoyamba.** Potengera kuti mbewu zamakono zimadzalidwa zochulukirachulukira chaka ndi chaka kwa zaka 19 kuyambira 1996 mpaka 2014, kukula kwa malo omwe panadzalidwa mbewu za makono mu chaka cha 2014 kunafika pa mahekala 181.5 miliyoni dziko lonse lapansi kufananitsa ndi mahekala 179.7 miliyoni omwe anadzalidwa mu chaka cha 2015, zomwe zikufanana ndi kuchepa kwa malo omwe pamalimidwa mbewu zamakono chaka ndi chaka omwe anachepa ndi 1.0% pakati pa 2014 ndi 2015. Mayiko ena anawonjedzera malo omwe anadzalapo mbewu zamakonozi pomwe mayiko ena anachepetsa mahekala omwe anadzalapo mbewuzi chifukwa cha kutsika mtengo kwa mbewu zomwe zimagulitsidwa; Kuchepa uku kwa mahekala omwe pamadzalidwa mbewu zimenezi kusintha, mtengo wa mbewuzi ukakwera mbewu ziyambanso kudzalidwa pamahekala ambiri. Kuchukula kwamahakala omwe pamadzalidwa mbewu zamakono kunapita patsogolo kutayimuza 100 kuchoka pa mahekala 1.7 miliyoni muchaka cha 1996 kufika pa mahekala 179.7 miliyoni muchaka cha 2015, zomwe zinapangitsa kuti mbewu zamakono zikhale zovomerredzeka/kulandiridwa nsanga mwamaluso onse okhudza mbewu omwe alipo masiku ano.

**MFUNDO # 3. Muchaka chachinayi, mayiko osawuka anadzala mbewu zamakono zambiri.** Mu chaka cha 2015, alimi aku Latin America, Asia ndi Africa onse pamodzi anadzala mahekala okwana 97.1 kapena kuti 54% yamahekala 179.7 miliyoni omwe panadzalidwa mbewu zamakonozi padziko lonse lapansi (ndipo 53% muchaka cha 2014) pofananitsa ndi mayiko olemera omwe anadzala mbewuzi pa mahekala 82.6 miliyoni kapena kuti 46% (ndipo 47% muchaka cha 2014); mchitidwe uwu ukuwoneka kuti ukhala

ukupitirira. Mwa mayiko 28 omwe anazala mbewu zamakonozi muchaka cha 2015, ambiri anali mayiko osawuka, 20 ndipo 8 olemera.

**MFUNDO #4. Mbewu Zomwe Chikhalidwe Chake Chinasinthidwa Polowetsa Tinthu Tomwe Timawonetsa Chikhalidwe Cha Mbewu Zina Mkati Mwake zinadzalidwa pa mahekala okwana 33% ya mahekala 179.7 miliyoni omwe panadzalidwa mbewu zamakonozi dziko lonse lapansi.** Mwamitundu yikuluyikulu yonse yitatu ya mbewu zamakonozi, alimi amakonda mbewu zomwe chikhalidwe chake chinasinthidwa polowetsa tinthu tomwe timawonetsa chikhalidwe cha mbewu zina mkati mwake. Mahekala omwe panadzalidwa mbewu zomwe chikhalidwe chake chinasinthidwa polowetsa tinthu tomwe timawonetsa chikhalidwe cha mbewu zina mkati mwake anachuluka kuchoka pa 51.4% miliyoni muchaka cha 2014 kufika 58.5 miliyoni muchaka cha 2015 – kuchuluka ndi mahekala 7.1 miliyoni zomwe zikufanana ndi kuchuluka kwa 14%. Mayiko 14 anadzala mbewu zomwe chikhalidwe chake chinasinthidwa polowetsa tinthu tomwe timawonetsa chikhalidwe cha mbewu zina mkati mwake zomwe zinali ndi chikhalidwe cha mbewu ziwiri kapena kuposera apo muchaka cha 2015, mwamayiko amenewa, 11 anali mayiko osawuka. Muchaka cha 2015 dziko la Vietnam linadzala chimanga chomwe chikhalidwe chake chinasinthidwa polowetsa tinthu tomwe timawonetsa chikhalidwe cha mbewu zina mkati mwake chontchedwa chimanga cha Bt/HT ngati mbewu yamakono yoyamba yodzalidwa mudzikolo.

**MFUNDO #5. Mfundo zikuluzikulu zamomwe mayiko osauka achitira mu chaka cha 2015.** Dziko la Latin America linalima mahekala ambiri kuposa dziko lina lili lonse motsogoleredwa ndi dziko la Brazil, ndipo lotsatira apo linali dziko la Argentina. Ku Asia, dziko la Vietnam linadzala mbewu zamakonozi kwa nthawi yoyamba ndipo khumbo lomwe dziko la Bangladesh lili nalo linapangitsa kuti dzikoli lidzale mabiringano a Bt ochuluka ndipo linasankhanso mpunga wa Golden, mbatata zamakono ndi nthonje lamakono ngati mbewu zomwe dzikoli lidzale mtsogolomu. Dziko la Philippines lakhala likudzala chimanga chamakono kwa zaka 13 popanda vuto lina lili lonse ndipo likutsutsa chigamulo chomwe Khoti la Suprimu linapereka posachedwapa choletsa mbewu zamakonozi, pomwe dziko la Indonesia latsala pang'ono kuvomereza mizimbe yodzalidwa pakhomu yopilira ku chilala. Dziko la China likupitirirabe kupeza phindu lochuluka kuchokera ku thonje la Bt (lapeza US\$18 biliyoni kuchokera muchaka cha 1997 mpaka 2014), ndipo posachedwapa kampani yaboma ya ChemChina inapereka lonjezo kuti lipereka US\$43 biliyoni ku kampani yopanga zinthu zothandiza pa ulimi ya Syngenta pogula katunduyo. Muchaka cha 2015 dziko la India linali dziko lomwe linakolola thonje lambiri dziko lonse lapansi ndipo thonje la Bt linathandizira kuti dziko la India lifike pamenepa, phindu lomwe dzikoli linapeza kuchokera muchaka ka 2002 kudzafika muchaka cha 2014 likuganiziridwa kuti ndi US\$18 biliyoni. Dziko la Africa nalo linapita patsogolo ngakhale kuti kunali chilala ku South Africa zomwe zinapangitsa kuti alimidwe malo ochepa ndi mahekala 700,000 muchaka cha 2015 – kuchepa kwambiri ndi 23%. Izi zikuwonetsa kufunikira kwa mbewuzi mu dziko la Africa momwe chilala chikuwopseza moyo, koma mwamwayi chimanga chamakono cha WEMA chopilira kuchilala chikupangidwa chomwe chiyambe kudzalidwa muchaka cha 2017. Dziko la Sudan linawonjedzera malo omwe limadzalapo thonje la Bt ndi 30% kufika mahekala 120,000 muchaka cha 2015 pomwe zinthu zambiri zinapangitsa kuti asalimidwe malo akulu ku Burkina Faso. Chofunikira kwambiri ndi choti muchaka cha 2015 mayiko 8 amu Africa anayeserera kudzala mbewu zothandiza kuti chuma cha anthu osawuka chikwere komanso mbewu zopambana zamu Africa chomwe ndi chinthu choyambirira kuchitika chotsogolera kuti mbewu zamakonozi zivomerezeke.

**MFUNDO #6. Zinthu zikuluzikulu zomwe zachitika ku US muchaka cha 2015.** Zinthu zambiri zinapita patsogolo kuphatikizapo: Kuvomeredza koyamba ndi kuyika pamtsika mbewu zamakono zatsopano zosiyanasiyana monga mbatata za Innate™ ndi maapozi a Artic®; kuyika pamtsika nyemba za SU canola™ zomwe ndi mbewu yoyamba yomwe chikhalidwe chake chinasinthidwa mosachita kulowetsa chikhalidwe cha mbewu yina mkati mwake; kuvomereza kwa nthawi yoyamba chakudya cha anthu chotchedwa GM

salmon chochokera ku nyama zomwe chikhalidwe chake chinasinthidwa polowetsa mkati mwake tinthu tomwe timawonetsa chikhalidwe cha nyama zina; komanso kulimbikitsa kagwiritsidwe ntchito ka R&D ka luso la sayansi lamphamvu kwambiri losinthira chikhalidwe cha mbewu lotchedwa CRISPR (Cluster Regularly Interspersed Short Palindromic Repeats); kudzala kwambiri chimanga chamakono chopilira ku chilala choyamba (wonani munsimu). Kuphatikiza Dow ndi DuPont kupanga DowDuPont.

**MFUNDO # 7. Kuchivomera kwambiri chimanga chamakono choyamba chopilira kuchilala chomwe chinadzalidwa mudziko la US.** Chimanga chamakono chopilira kuchilala cha DroughtGard™ chinadzalidwa kwanthawi yoyamba ku US muchaka cha 2013 ndipo mu chaka cha 2015 mahekala omwe panadzalidwa chimanga chimenechi anawonjezekera kutayimuza ka 15 kuchoka pa mahekala 50, 000 muchaka cha 2013 kufika mahekala 810,000 zomwe zikusonyeza kuti alimi anachilandira kwambiri chimanga chimenechi. Chochitika chomwechi chaperekedwa ku bungwe la public-private partnership WEMA (Water Efficient Maize for Africa), lomwe cholinga chake ndi kupereka panthawi yoyenerera chimanga chamakono chopilira kuchilala ku mayiko osankhika chabe amu Africa chikamafika chaka cha 2017.

**MFUNDO #8. Momwe mbewu zamakono zikuchitira ku EU.** Mayiko asanu omwe aja aku EU akupitirizabe kudzala chimanga cha makono cha Bt pa mahekala 116,870 omwe ndi ochepa ndi 18% kufananisa ndi mahekala omwe analimidwa mu chaka cha 2014. Mahekala omwe analimidwa anachepa mumayiko onse chifukwa cha zinthu zingapo kuphatikizapo, chimanga chochepa chinadzalidwa, kusowa kwa chilimbikitso kwa alimi omwe akukumana ndi mavuto.

**MFUNDO #9. Mphindu lomwe mbewu zamakono zinapereka.** Kawuniwuni wa makafukufuku wokwana 147 omwe akhala akuchitika zaka 20 zapitazi anawonetsa kuti “**kuvomerezeka kwa maluso asayansi osinthira chikhalidwe cha mbewu zapangitsa kuti mankhwala ophera tizilombo mumbewu agwiritsidwe ntchito ochepa ndi 37%, zomwe zapangitsa kuti zokolola zichuluke ndi 22% ndi kupangitsa kuti phindu la alimi lichuluke ndi 68%**” (Qaim et al, 2014). Zotsatira izi zikugwirizana ndi zotsatira za akafukufuku ena apachaka adziko lonse lapansi (Brookes et al, 2015). Kuyambira mu chaka cha 1996 kuzafika chaka cha 2015, mbewu zamakono zathandiza kuti kukhale Chakudya Chokwanira, Kukhala odzidalira komanso Kunsintha kwa nyengo: powonjedzera zokolola zokwana US\$150 biliyoni; kupereka malo abwino okhala popangitsa kuti mankhwala ophera tizilombo okwana makilogalamu 584 miliyoni asagwiritsidwe ntchito; mu chaka cha 2014 chokha, mpweya wa CO<sub>2</sub> wotulutsidwa ndi magalimoto unachepetsedwa ndi makilogalamu 27 biliyoni zomwe zikufanana ndi kuchotsa magalimoto 12 miliyoni pa msewu kwa nthawi yokwana chaka chimodzi; kuteteza chilengedwe popangitsa kuti mahekala 152 miliyoni asalimidwe kuchokera chaka cha 1996 kuzafika 2014; kuthandiza kuchepetsa umphawi wa alimi ang’onoang’ono 16.5 miliyoni ndi mabanja awo, onse pamodzi akukwana anthu pafupifupi 65 miliyoni omwe ndi ena mwa anthu osauka kwambiri padziko lonse lapansi. Mbewu zamakono ndi mbewu zofunika kwambiri koma siyankho pa izo zokha- zimafunika kutsatira malimidwe abwino monga kudzala mbewu mosinthanitsa minda komanso ku samalira mbewu zokanika ngati momwe zimafunikira ndi mbewu zina zamasiku onsenzi.

**MFUNDO #10. Tsogolo la Mbewuzi.** Zinthu zitatu ndizofunika kuziganizira. **Choyambirira**, kulandiridwa kwambiri kwambewuzi (90% mpaka 100%) mumisika yambiri ya mbewuzi **zomwe zikupereka mwayi wochepea woti nkuwonjedzera malo odzala mbewuzi**; komabe pali mwayi wawukulu mumayiko ena a tsopano wa mbewu zina zochepea monga chimanga chamakono chomwe chili ndi mwayi woti chikhonza kudzalidwa pa mahekala 100 miliyoni dziko lonse lapansi, mahekala 60 miliyoni ku Asia (35 miliyoni ku China kokha), ndi 35 miliyoni ku Africa. **Chachiwiri**, pali **mbewu zomwe zikupangidwa zatsopano zopitirira 85** zomwe akuziyetsererera kudzala, chomwe ndi chinthu chomalizira kuchita kuti mbewuzi zifike povomerezeka. Mbewu izi palinso chimanga cha WEMA chomwe ndi chopilira ku chilala chomwe

chikuyembekedzeka kudzalidwa ku Africa chaka cha 2017, mphunga wa Golden ku Asia komanso nthochi zolimbisidwa ndi khobwe wopilira kutizilombo zikuwoneka kuti zitha kukula bwino ku Africa. Ngati bungwe, public-private partnership (PPP) akwanitsa kupanga mbewu zovomerezeka komanso kuzipereka izo kwa alimi. **Chachitatu**, kupezeka kwa mbewu zomwe chikhalidwe chake chinasinthidwa zintha kukhala chinthu chofunikira kwambiri chomwe anthu asayansi apeza. **Luso la sayansi laposachedwapa komanso lomwe likupereka chiyembekezo ndi luso lamphamvu lotchedwa CRISPR**. Anthu ozindikira bwino omwe akuyang'anitsitsa momwe ntchito iyi yikuyendera ali ndi chikhulupiriro kuti kusintha chikhalidwe cha mbewu posachita kulowetsa tinthu towonetsa chikhalidwe cha mbewu zina mkati mwake kuli ndi ubwino womwe ukubwera panthawi yake kusiyana ndi mbewu zina zamasiku onse kapena zomwe chikalidwe chake chinasinthidwa polowetsa tinthu towonetsa chikhalidwe cha mbewu zina mkati mwake, ubwino uwu wuli munjira zinayi: **zilibe zolakwika, sizimatenga nthawi yambiri, sizimalowa mthumba (sizimafuna ndalama zambiri) komanso zilibe malamulo ovuta**. Kusiyana ndi malamulo ovuta omwe amatsatiridwa posintha chikhalidwe cha mbewu pochita kulowetsa tinthu towonetsa chikhalidwe cha mbewu zina mkati mwake, mbewu zomwe chikhalidwe chake chasinthiwa, posachita kulowetsa tinthu tomwe timawonetsa chikhalidwe cha mbewu zina mkati mwake, zimazipangitsa zokha kukhala zopangirapo maluso asayansi, zinthu zonse mkati mwake zimakhala pamulingo woyenerera komanso sizimatsatira malamulo ovuta. **Njira yina yosinthira chikhalidwe cha mbewu yoti yigwiritsidwe ntchito mtsogolo yaperekedwa (Flavell, 2015) yomwe yikuphatikiza mtundu wa tinthu towonetsa chikhalidwe cha mbewu yina tomwe talowetsedwa mu mbewu yina, kusintha chikhalidwe cha mbewu mosachita kulowetsa tinthu towonetsa chikhalidwe cha mbewu yina ndi tizilombo tosawoneka ndi maso (kugwiritsa ntchito tizilombo tomwe timakhala muzomera ngati tinthu towonjedzera tatsopano tosinthira chikhalidwe cha mbewu) kuti tipeze zokolola zambiri, polimbikitsa njira “zomwe zingakhale zopitirira” zomwe zingathandize kukwaniritsa zolinga zopambana zofuna kukhala ndi chakudya chokwanira komanso kuthesa njala ndi umphawi.**

ISAAA sibungwe lomwe cholinga chake ndi kupanga phindu koma limathandizidwa ndi maofesi a boma komanso makampani. Mahekala onse omwe pamadzalidwa mbewu zamakono omwe atchulidwa mu zolembedwa zonse za ISAAA amawerengedwa kamodzi khonkha posatengera kuti mumbewuyo munayikidwa zikhalidwe za mbewu zamitundu yingati. Tsatanetsatane wa izi walembedwa mu ISAAA Brief “20<sup>th</sup> Anniversary (1996 to 2015) of the Global Commercialization of Biotech Crops and Biotech Crop Highlights in 2015”, cholembedwa ndi a Clive James. Mukafuna kudziwa zambiri yang'anani ku <http://www.africenter.isaaa.org> kapena yimbani ku ISAAA *AfriCenter* pa nambala iyi +254 20 4223616 kapena lembani kalata yoyenda pa magesi ku [africenter@isaaa.org](mailto:africenter@isaaa.org).